CITY OF NEW BALTIMORE

STORMWATER MANAGEMENT SYSTEM

OPERATIONS AND MAINTENANCE PLAN

June, 2024

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I. PURPOSE

The primary purpose of the Operations & Maintenance Plan (O&M Plan) shall be to minimize stormwater pollution from operation and maintenance activities conducted by the City of New Baltimore in its management of the DPW and Water Department.

II. COVERAGE AREA

The coverage area considered in this document includes All City of New Baltimore Entities.

III. APPLICABLE OPERATIONS

The O&M Plan covers the following City operations:

- All routine and preventative maintenance of the City of New Baltimore stormwater system
- Road, Bridge, sidewalk, and parking lot maintenance practices, including: deicing, snow removal, and salting.
- Vehicle fleet maintenance, including: mechanical repairs, fueling, and washing.
- External building maintenance, including: exterior cleaning, washing, painting, and other maintenance activities.
- Grounds maintenance, including: fertilizer, pesticides, and herbicide application, green waste disposal, trash management, and sediment and erosion control.
- Materials storage, including: stockpiling of gravel or other debris and heavy equipment storage.

IV. OPERATION AND MAINTENANCE PROCEDURES

All scheduled inspections and maintenance of the City of New Baltimore's stormwater system are contained in the stormwater Management System Inspection and Maintenance Logs included as Appendix A

All City operations listed in section lll above shall be conducted in accordance with the applicable Standard Operating Procedures as outlined below. Standard Operating Procedures for City operations & maintenance are included in Appendix B and are summarized in Table 1 below.

Table 1. Summary of Standard Operating Procedures for City Operations & Maintenance

STANDARD OPERATING PROCEDURES	APPLICABLE WORK
Building & Grounds Maintenance	All work conducted to maintain City building and grounds.
Drainage System Maintenance	Routine and preventative work on the City of New Baltimore's Stormwater System
Housekeeping Practices	Work involving everyday use of the City's buildings and grounds (storage, use, cleanup, etc)
Landscape Maintenance	Work to City's landscaping, including but not limited to vegetation removal, fertilization, herbicide application, watering, etc.

Materials Storage, DPW Yard	The storage of toxic materials at the DPW Yard
Materials Storage, Waste Water Treatment Plant	The storage of toxic materials at the wastewater treatment plant
Materials Storage, Water Treatment Plant	The storage of toxic materials at the water treatment plant.
Non-Stormwater Discharges	Discharges that involve flows that do not consist entirely of stormwater.
Outdoor Container Storage	Containment of outdoor, above ground liquid storage tanks, drums and dumpsters, holding contaminants
Outdoor Equipment Maintenance	Outdoor processes such as grinding, painting, coating, sanding, cleaning, etc.
Outdoor Loading and Unloading	Loading and unloading of materials that could hold contaminants..
Outdoor Storage of Raw Materials	Raw materials, by-products, finished products, containers, and material storage areas located outside, exposed to rain and/or runoff.
Parking/Storage Area Maintenance	Parking lots and storage areas maintenance.
Plaza and Sidewalk Cleaning	Pedestrian traffic areas and plaza maintenance.
Road and Street Maintenance	Road and street maintenance (street sweeping and cleaning, street repair, resurfacing, painting, etc.)
Safer Alternative Products	typical city maintenance work that uses cleaning solutions, janitorial chemicals, automotive products, fertilizers, etc.
Salt Application and Storage	application and storage of de-icing materials
Spill Prevention, Control & Cleanup	Controlling, cleaning and preventing spills of toxic materials
Vehicle and Equipment Cleaning	The washing of vehicles and equipment
Vehicle and Equipment Fueling	Fueling vehicles and equipment
Vehicle and Equipment Repair	Repairs done on vehicles and equipment
Waste Handling & Disposal (Solid Waste)	Storage and handling of solid toxic wastes
Waste Handling & Disposal	Handling and disposal of typical trash
Water & Sewer Utility Maintenance	Operation and maintenance of public utilities

APPENDIX A

STORMWATER MANAGEMENT SYSTEM

INSPECTION AND MAINTENANCE LOGS

Ditches/Swales/Leaching Basins (suggested frequency-as needed and on schedule with catch basins)

1. Ditches, swales and leaching basins should be inspected at the same time as the inspection of catch basins within the same area.
2. Public complaints shall warrant inspection.
3. When cleaning, remove obstacles/debris
4. Whenever possible, cut/remove vegetation (as opposed to scraping) to allow capture of sediment.
5. Excessive siltation in ditching may indicate the need to re-grade the ditch.
6. During ditch scraping, maintain vegetation downstream of ditch to capture sediment.

SEE COMBINED LOG ON PAGE 8

Storm Structures (annual inspection, 100 -200 city basins cleaned annually and as needed)

1. Structure cleaning and inspection shall be done concurrently.
2. Identify catch basins that need frequent maintenance, and prioritize
3. During cleaning, identify the need for repair of structure (also pertains to manholes and piping).
4. Clean catch basins when debris has filled it 1/3 of the way to the outlet
5. Inspect/determine the need for cleaning after storm events
6. Coordinate catch basin cleaning with related street/parking lot sweeping events

Prior to catch basin maintenance, conduct visual inspection to ensure the water in the sump has not been contaminated. If necessary, collect a grab sample of the water and look for signs of contamination such as visible sheen, discoloration, obvious odor, etc.

If there is any doubt of the quality of water, it should be collected into a vactor truck and treated as waste under part 121 or part 115 Solid waste Management (part 115) of NREPA.

Using a sump pump or any other pumping mechanism, remove much of the water in the sump without disrobing the solid material below. Do not use pumps connected to the vactor truck's holding tank.

The clear water may be directly discharged to one of the following:

- Sanitary system (with prior approval from Macomb County sewer plant)
- Curb and gutter
- Applied to the ground adjacent to the catch basin (evenly distributed at a maximum rate of 250 gallons/acre/year)

The water can not be pumped back into the storm water system.

The resulting solid waste is transfered to drying beds at the DPW/WWTP yard to designated locations that do not drain to storm structures.

*Annual updates and or revisions shall be made to prioritize problem areas based on inspection findings and citizen complaints.

SEE COMBINED LOG ON PAGE 8

STORM DRAIN INSPECTION FORM

DATE:_____ TIME:_____ INSPECTOR:_____

LOCATION INFORMATION:
ADDRESS / LOCATION:_____
SOURCE FLOW: ___GROUND WATER ___IRRIGATION ___CONDENSATE ___RESIDUAL ___STORMWATER ___UNKNOWN
WEATHER:_____ APPROX TEMP:_____ WIND PRESENT: YES NO
PRECIPITATION IN PAST 3 DAYS: YES NO
FLOW: ___NONE ___TRICKLE ___STEADY ___HIGH

INSPECTION INFOMRATION (CIRCLE ALL THAT ARE APPLICABLE)

OBVIOUS DEBRIS / POLLUTION: NONE BROWNISH FOAM FLOATING GREEN SCUM OIL/FILM/SHEEN ORGANIC MATERIALS (PLANT DEBRIS, DEAD ANIMALS) TRASH AND DEBRIS WHITE FOAM SEWAGE MATERIALS
ODOR: NONE/NATURAL MUSTY SEWAGE/SEPTIC
WATER CLARITY: CLEAR CLOUDY OPAQUE

ADDITIONAL INFORMATION:
SEDIMENT IN STRUCTURE/CHANNEL: ___OPEN ___1/4 FULL ___1/2 FULL ___3/4 FULL __PLUGGED
SEDIMENT AROUND GRATE: ___YES **___**NO
STRUCTURE CONDITION: ___EXCELLENT ___GOOD ___FAIR ___POOR
TRASH/LITTER PRESENT IN AREA: YES NO
EROSION, SLIDES, DRILLING ON ADJACENT HILLSIDES, DITCH OR CHANNEL SIDES: YES NO
NEARBY ACTIVITIES THAT IMPACT STORMWATER QUALITY OR CREEK: YES NO
(IF YES – DESCRIBE)_____
_____
DESCRIPTION OF ACTIVITIES:_____
_____
GENERAL COMMENTS:_____
_____
_____
ACTIONS TAKEN:_____
_____
_____
FOLLOW UP REQUIRED: YES NO _____LIST CORRECTIVE ACTIONS ON BACK

CORRECTIVE ACTIONS

LOCATION:_____ DATE:_____

LIST ALL FOLLOW-UP ITEMS IDENTIFIED DURING THE INSPECTION

CORRECTIVE ACTION	INITIALS	DATE COMPLETED

Street Sweeping (inspection and city's curbed roads cleaned 4-6 times per year)

1. City owned parking lots are included.
2. Inspect/clean roads 4 to 6 times per year. At the minimum roads should be inspected and cleaned at each seasons' end (spring, summer, winter, fall (if possible)) .
3. Group streets in sections. Streets without curbing and catch basins do not apply.
4. Note any road damage that may hinder storm flow to structures.
5. The City uses an Elgin Broom Badger Mechanic Sweeper. The sweeper should always be used per manufacturer's recommendations.
6. Operators should always be used with preventing sweeper debris from entering any sewers or surface waters.
7. More frequent sweeping may be needed in targeted areas on the basis of pollutant load reduction potential (based on inspections, pollutants, catch basin cleaning, land use, and surface water location).
8. Street sweeping should be performed at posted road speed limits.
9. No sweeping should be done during inclement weather (rain, snow).
10. If spills occur or illegal discharges are seen, report to the proper authorities.
11. Sweepers should be regularly maintained.
12. Employees should be properly trained on equipment prior to sweeping.
13. Records should be kept and the following should be included:
    - Date/Weather/
    - Streets swept
    - Miles swept
    - Employees who performed work
14. All solid waste must be disposed of in a licensed landfill.

CITY OF NEW BALTIMORE
STORMWATER MANAGEMENT PROGRAM
STREET SWEEPING LOG

Location: _____

Date Swept: _____

Employee/Company: _____

Debris Disposal Location: _____

Photo Documentation? _____

Additional Notes:

On site Material Storage Inspection - Monthly

and Comprehensive Inspections - Bi-annually

See the following Standard Operating Procedures (SOPs):

SOP - Material Storage - DPW Yard

SOP - Material Storage - Water Treatment Plant

SOP - Material Storage - Wastewater Treatment Plant

SITE INPSECTION - MATERIALS
NEW BALTIMORE DPW YARD

All significant materials stored on site must be inspected for leaking, contamination and damage to container.

Inspector:

Inspection Date:

List of materials stored on site.

	Material Name	Handling and Storage Procedure	Potential for Discharge	Inspected
1	Vehicle Oil	1 qt. bottles, 55 gallon steel drum, 100 gallon steel tank, inside	low risk	
2	Diesel Fuel	1000 gallons tank, stored outside in double containment	low risk	
3	Gasoline	1000 gallon tanks, outside, double containment fire resistent tank	low risk	
4	Hydraulic Fluids	55 gallon steel drums, stored indoors in shop area	low risk	
5	Antifreeze	55 gallon steel drums, stored indoors in shop area	low risk	
6	Rock Salt	1000 ton, stored indoors in barn on impervious surface	low risk	
7	Gravel	500-1000 ton 21A limestone, stored outdoor in pile	low risk	
8	Sand	500-1000 ton, stored outdoor in pile	low risk	
9	Windshield Solvent	1 gallon jugs as needed, stored indoors in shop area	low risk	
10	Paint	spray cans and 1-5 gallon jugs, stored indoors in shop area	low risk	
11	Cold Path	1-10 tons, indoor in salt barn	low risk	

Is any material leaking?

If yes, list material and describe

If yes, is there contamination due to the leaking?

Are any storage containers damaged?
If yes, describe

Please note and describe any other concerns involving significant on site materials. (Example - Material not properly cleaned up after use)

Inspector signature

Date

SITE INPSECTION - MATERIALS

NEW BALTIMORE WASTE WATER TREATMENT PLANT

All significant materials stored on site must be inspected for leaking, contamination and damage to container.

Inspector:

Inspection Date:

List of materials stored on site.

	Material Name	Handling and Storage Procedure	Potential for Discharge	Inspected
1	Sludge	1.3 MG underground storage tanks on WWTP property	low risk	
2	Ferric Chloride	6,000 gal in fiberglass tank w/ containment pit	low risk	
3	Chlorine	Sealed 55 gal. drums, indoors	low risk	
4	Polymers	Sealed 55 gal. drums, indoors	low risk	
5	Gas & Oil	pint containers and 55 gallon drums, indoors	low risk	

Is any material leaking?

If yes, list material and describe

If yes, is there contamination due to the leaking?

Are any storage containers damaged?
If yes, describe

Please note and describe any other concerns involving significant on site materials. (Example - Material not properly cleaned up after use)

Inspector signature

Date

SITE INPSECTION - MATERIALS

NEW BALTIMORE WATER TREATMENT PLANT

All significant materials stored on site must be inspected for leaking, contamination and damage to container.

Inspector:

Inspection Date:

List of materials stored on site.

	Material Name	Handling and Storage Procedure	Potential for Discharge	Inspected
1	Sulfric Acid	Less than 1 gallon, stored indoors	low risk	
2	Citric Acid	Stored in 55 gallon drum, indoors, twice/yr for one week	low risk	
3	Sodiumhypochlorite	Stored in 3000 gallon bulk tank, stored indoors, locked bldg	low risk	
4	Hyrdrofluosilic Acid	100-500 gallons, in 55 gallons drums, stored indoors, locked bldg	low risk	

Is any material leaking?

If yes, list material and describe

If yes, is there contamination due to the leaking?

Are any storage containers damaged?
If yes, describe

Please note and describe any other concerns involving significant on site materials. (Example - Material not properly cleaned up after use)

Inspector signature

Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE DPW YARD

Inspect the entire property for any issues, concerns, or needed repairs. **Page 1 of _____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Inspection of all storm structures on site:

List any storm structures over 1/2 full:

List any storm structures needing repair and note repair needed:

Are there any concerning discharges to the structures?:

Inspection of outside storage yards and buildings:

Note any leaks from vehicles/machines:

Note any leaks from stored materials:

Notes any repairs to storage containment:

Indoor inspection:

Note any leaks form vehicles/machines stored indoors:

Note any leaks from materials stored indoors:

Note any repairs to storage containment:

Material Storage Inventory:

	Material Name	Handling and Storage Procedure	Current Amount Stored	Inspected
1	Vehicle Oil	1 qt. bottles, 55 gallon steel drum, 100 gallon steel tank, inside		
2	Diesel Fuel	1000 gallons tank, stored outside in double containment		
3	Gasoline	1000 gallon tanks, outside, double containment fire resistent tank		
4	Hydraulic Fluids	55 gallon steel drums, stored indoors in shop area		
5	Antifreeze	55 gallon steel drums, stored indoors in shop area		
6	Rock Salt	1000 ton tank, stored indoors in barn		
7	Salt Brine *only during winter	5000 gallon poly tank		
8	Beet Juice *only during winter	5000 gallon poly tank		
9	Gravel	500-1000 ton 21A limestone, stored outdoor in pile		
10	Sand	500-1000 ton, stored outdoor in pile		
11	Windshield Solvent	1 gallon jugs as needed, stored indoors in shop area		
12	Paint	spray cans and 1-5 gallon jugs, stored indoors in shop area		
13	Cold Path	1-10 tons, indoor in salt barn		

Please note and describe any other on site concerns:

Inspector signature Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE DPW YARD

Inspect the entire property for any issues, concerns, or needed repairs. **Page ____ of ____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Additional Notes:

Inspector signature Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE WWTP

Inspect the entire property for any issues, concerns, or needed repairs. **Page 1 of ____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Inspection of all storm structures on site:

List any storm structures over 1/2 full:

List any storm structures needing repair and note repair needed:

Note any vegetation issues on site and at swales:

Are there any concerning discharges to the structures or swales?:

Inspection of outside structures:

Note any leaks or damage on containment structures:

Notes any repairs needed to on site structures:

Indoor inspection:

Note any leaks from indoor mechanical features:

Note any leaks from indoor containment:

Note any leaks from materials stored indoors:

Note any repairs to storage containment:

Material Storage Inventory:

	Material Name	Handling and Storage Procedure	Current Amount Stored	Inspected
1	Sludge	1.3 MG underground storage tanks on WWTP property		
2	Ferric Chloride	6,000 gal in fiberglass tank w/ containment pit		
3	Chlorine	Sealed 55 gal. drums, indoors		
4	Polymers	Sealed 55 gal. drums, indoors		
5	Gas & Oil	pint containers and 55 gallon drums, indoors		

Please note and describe any other on site concerns:

Inspector signature Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE WWTP

Inspect the entire property for any issues, concerns, or needed repairs. **Page _____ of _____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Additional Notes:

Inspector signature Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE WTP

Inspect the entire property for any issues, concerns, or needed repairs. **Page 1 of _____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Inspection of all storm structures on site:

List any storm structures over 1/2 full:

List any storm structures needing repair and note repair needed:

Are there any concerning discharges to the structures or swales?:

Note any issues with on site drainage running directly to Anchor Bay:

Inspection of outside structures:

Note any leaks or damage on containment structures:

Notes any repairs needed to on site structures:

Indoor inspection:

Note any leaks from indoor mechanical features:

Note any leaks from indoor containment:

Note any leaks from materials stored indoors:

Note any repairs to storage containment:

Material Storage Inventory:

	Material Name	Handling and Storage Procedure	Current Amount Stored	Inspected
1	Sulfric Acid	Less than 1 gallon, stored indoors		
2	Citric Acid	Stored in 55 gallon drum, indoors, twice/yr for one week		
3	Sodiumhypochlorite	Stored in 3000 gallon bulk tank, stored indoors, locked bldg		
4	Hyrdrofluosilic Acid	100-500 gallons, in 55 gallons drums, stored indoors, locked bldg		

Please note and describe any other on site concerns:

Inspector signature Date

COMPREHENSIVE SITE INSPECTION LOG
NEW BALTIMORE WTP

Inspect the entire property for any issues, concerns, or needed repairs. **Page ____ of ____**

Inspection scheudle: biannually *** use additional sheets for descriptions if needed.**

Inspector:

Inspection Date:

Additional Notes:

Inspector signature Date

Discharge Point Inspection (Dry inspection yearly)

Prioritize discharge points and perform dry inspection annually.

Visually inspect the outlet, the receiving waters and the surrounding area of each point.

Note the following:

- Water flowing?
- Damage to outlet?
- Erosion at outlet?
- Blockage to outlet?
- Debris within outlet?

Wet weather inspections should be performed after rain event where outlet should be flowing.

Note the following for wet weather inspections:

- Water flowing?
- Cloudy?
- Color?
- Odor?
- Debris/sheen/foam?

CITY OF NEW BALTIMORE
STORMWATER MANAGEMENT PROGRAM
DISCHARGE POINT INSPECTION

Discharge Point Location: _____

Discharge Point ID: _____ Inspector: _____

Map ID: _____ Day/Date: _____

Weather/Temp: _____

Receiving Surface Water or Other MS4 Jurisdiction: Time: _____

_____

Photos taken?: _____

During/After Rain Significant Rain Event?: _____
(If "Yes" document the rain event below)

Dry Weather Inspection:
Visually Inspect the outlet, the reciving waters and the surronding areas.
(If "Yes" please describe)

Is there flow through outlet? _____
Damage to Outlet? _____
Erosion at Outlet? _____
Blockage to Outlet? _____
Debris within Outlet? _____

Note any concrens of the outlet, recieveing waters, and surronding areas below.

Wet Weather Inspection:
Take water sample and visually inspect physical properties.
(If "yes" please describe)

Cloudy? _____
Color? _____
Odor? _____
Debris/Floating solids/oil sheens/foam? _____

Notes:

E. coli Reduction

A preventable potential source of E. coli contamination within the City's property is improper pet waste disposal on the Park Grounds. Signage with pet waste bag dispensers are placed in the parks reminding park goers to pick up their pet's waste.

Wildlife, specifically seagulls can contribute to any E. coli contamination at the outfalls. If E. coli testing shows results above standards the area will be monitored for avian or other wildlife grouping. The City currently uses "screechers" sounds to reduce the amount of seagulls collecting at the beach and adjacent park.

In addition to these measures the City also maintain a street sweeping schedule to which cleans streets at the end of every season. The reduction in street debris also reduces contamination into surface waters and leads to an E.coli reduction.

E. coli Testing

The New Baltimore beach is tested for E. coli by the Macomb County Health Department several times per month from April through September.

If obvious discoloration of the water or odors are observed, Macomb County Health Dept. should be notified immediately.

Beyond the County screening at the beach, New Baltimore tests all points of discharges twice within 5 year periods.

E. coli Testing Procedure

- Set a sample schedule where a sample at each point of discharge will be taken every two years.
- Prior to sampling, conduct a visual inspection. Note the condition of the water, including color and any obvious odors. Note any noticeable earth disturbance, debris or damage to structures at the outlet as well as any obstruction to the flow.
- Take samples at each discharge point during a wet weather event, described as a precipitation event that produces at least 0.25" of rain over a 24 hour period.
- Take samples within 30 to 60 minutes of the start of the rain event.

- Take water samples and perform test per manufacturer's directions.

***Water Quality Standard for* E. coli**

Total Body Contact (May1 - October 31):
Daily Maximum Geometric Mean: 300 E. coli per 100 milliliters (ml)
30-Day Geometric Mean: 130 E. coli per 100 ml

Partial Body Contact (all year):
Daily Maximum Geometric Mean: 1,000 E. coli per 100 ml

- If the results are below the standards listed, no further action is needed. Report findings on the log.
- If the results are above the standards listed, action be taken to identify the source(s) of E.coli.
    - Inspect the entire area that flows into the surface water at the discharge point.
    - Perform the applicable procedure to determine the contamination cause.
    - Once the contaminant is located, perform the necessary maintenance, disposal, or storage procedure. If the source is coming from private property, follow the procedure for illicit discharges.
    - Retest the location 30 days later.
    - If the E.coli levels are still above normal, continue investigating potential sources and/or implementing additional BMPs.

CITY OF NEW BALTIMORE
STORMWATER MANAGEMENT SYSTEM
INSPECTON AND MAINTENANCE SCHEDULE

E.coli Testing	
Inspector's Name:	
Date:	
Weather Conditions:	
Receiving Water:	
Area 1: (Location of sample)	
Area 2: (Location of sample)	
Sample ID:	
Area 1:	
Area 2:	
Observations:	
Location:	
Water Color:	
Odor:	
Disturbance at outlet:	
Structure damaage at outlet:	
Notes:	
Location:	
Water Color:	
Odor:	
Disturbance at outlet:	
Structure damaage at outlet:	
Notes:	

CITY OF NEW BALTIMORE
STORMWATER MANAGEMENT SYSTEM
INSPECTON AND MAINTENANCE SCHEDULE

E.coli Testing (cont.)

Test Results

Area 1: _____

Is further action needed?: Yes No

Area 2: _____

Is further action needed?: Yes No

Further Actions:

Area: _____

Determine if any maintenance work was performed within the drainage area that did not meet Standard Operating Procedure guidelines.

Notes:

Perform the following Standard Operating Procedures:

Housekeeping Practices	Date:	By:
Drainage System Maintenance	Date:	By:
Road and Street Maintenance	Date:	By:
Buildings and Grounds Maintenance	Date:	By:
Landscaping Maintenance	Date:	By:
Non-Stormwater Discharges	Date:	By:

Found cause of E.coli contamination and corrective actions:

CITY OF NEW BALTIMORE
STORMWATER MANAGEMENT SYSTE, APPENDIX B
STANDARD OPERATING PROCEDURES

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BUILDING & GROUNDS MAINTENANCE

OVERVIEW

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. To prevent and reduce the discharge of pollutants to stormwater from building and ground maintenance activities with associated constituents of sediment, nutrients, trash, metals, bacteria, oil and grease, organics, and oxygen demanding elements, please review and apply the following approaches and recommendations below.

APPROACH

General Assessment

All City owned properties should be assessed for the following factors:

- Amount of pollutant stored at each site.
- Identify any improperly stored material.
- Any polluting activities that is conducted outside.
- Proximity of property to waterbodies
- Poor housekeeping procedures

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects-

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected, but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.

- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities-

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction-

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.
- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting-

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water; do NOT put it in the storm drain, pour over the landscaped areas.
- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management (If done by staff)-

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occurring or predicted. Do not apply insecticides within 100 feet of surface waters such as rivers, open drains, lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection-

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Re-assement

- The procedures noted should be re-assessed at needed.
- The timeframe for updating/revising the assessment is 30 days prior to discharging storm water from a new facility and within 30 days of determining a need to revise the procedures.

REQUIREMENTS

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do NOT hose down the area to a storm drain.

MEASURABLE GOALS

- Document movement away from pesticides or fertilizers or storage of these items.
- # of staff trained in this procedure.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

DRAINAGE SYSTEM MAINTENANCE

OVERVIEW

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding. To ensure proper maintenance and effectiveness of these drainage systems, please review and apply the following approaches, protocols, and requirements below. This maintenance procedure shall be reviewed and updated annually based on new construction on municipal property or storm water utility.

APPROACH

Protocols

General

- new structural storm water controls for water quantity shall be designed and implemented in accordance with the Macomb County post-construction storm water runoff control performance standards and long term operation and maintenance requirements.

Catch Basin/Inlet Structures/Rear Yard Basins/Stormwater Separators (Aqua Swirls)/Rain Gardens-

- Municipal staff should regularly inspect and clean facilities to ensure the following:
  - -Inspection and cleaning shall occur concurrently.
  - -The city is divided into 4 quadrants and the structures in each quadrant will be inspected/cleaned once every 4 years.
  - -Immediate repair of any deterioration threatening structural integrity.
  - -Cleaning before the sump is 50% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - -Rear yard basin inspections shall be done along with the structures in each quadrant. Cleaning will be performed as needed.
  - -Separators should be inspected annually.
- Clean catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Separators should be cleaned using vac trucks per manufacturer's instructions.
- Update maintenance logs to include new structures within 30 - 45 days after implementation.
- Record the amount of waste collected.

- Waste collected from cleaning activities will be placed on a roll off dumpster for transport to the land fill by waste hauler.
- Waste will be transferred to drying beds at the DPW yard/WWTP yard where drainage does not flow into storm sewers. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do NOT dewater near a storm drain, river or stream.
- Except for small neighborhood with relatively few catch basins that may be cleaned manually, most areas will require mechanical cleaners such as educators, vacuums, or bucket loaders.
- Inspect rain gardens biannually using storm drain inspection form.

Outfalls and Points of Discharge

- Dry weather screening should be performed at least once on each location per 5 years period.
- Inspectors should complete the Dry Weather Screening Field Sheet per location and keep on file.
- Any abnormal observations should be reported to the City's Enforcement Coordinator. Location should be further inspected for illicit discharge.

Storm Drain Conveyance System-

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations-

- Pump Stations should be inspected monthly.
- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do NOT allow discharge from cleaning a storm drain pump station, or other facilities to reach the storm drain system.
- Conduct quarterly routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.
- Sample collected sediments to determine if landfill disposal is possible, or if illegal discharges in the watershed are occurring.
- Revise this procedure within 30 days upon the implementation of a new pump station.

Open Channel-

- Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value.

- Conduct channel modification/improvement in accordance with existing laws. Contact the State of Michigan at 800-662-9278 to investigate which agencies will regulate the proposed activity. The developer-applicant should also contact local governments (city, county, special districts).

Illicit Connections and Discharges-

- During routine maintenance of conveyance system and drainage structures, field staff should look for evidence of illegal discharges or illicit connections:
  - -Is there evidence of spills such as paints, discoloring, etc.
  - -Are there any odors associated with the drainage system
  - -Record locations of apparent illegal discharges/illicit connections
  - -Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of up gradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
  - -Once the origin of flow is established, require illicit discharger to eliminate the discharge.
- Stencil or color code storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should be color coded or have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Please refer to the fact sheet found within the Non-Stormwater Discharges section.

Illegal Dumping-

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - -Illegal dumping hot spots
  - -Types and quantities (in some cases) of wastes
  - -Patterns in time of occurrence (time of day/night, month, or year)
  - -Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - -Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Please refer to the fact sheet found within the Non-Stormwater Discharges section.
- To report environmental violations during business hours, contact the State's Environmental Assistance Division at 800-662-9278. Emergency calls and calls

after business hours, during weekends, and holidays should be directed to the Pollution Emergency Alerting System (PEAS) at 800-292-4706.

Training-

- Train crews in proper maintenance activities, including record keeping and disposal.
- Only properly trained individuals are allowed to handle hazardous materials/wastes.
- Train municipal employees from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report illegal dumping.
- Train municipal employees and educate businesses, contractors, and the general public in proper and consistent methods for disposal.
- Train municipal staff regarding non-stormwater discharges (Please see the Non-Stormwater Discharges section).

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Requires technical staff to detect and investigate illegal dumping violations, and to coordinate public education.

MEASURABLE GOALS

- Volume of sediment removed from the system per year.
- Volume of trash removed from the system per year.
- Number of structures cleaned or maintained per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

HOUSEKEEPING PRACTICES

OVERVIEW

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials. These harmful materials include, but are not limited to, fertilizers, pesticides, cleaning solutions, paint products, automotive products and swimming pool chemicals. To reduce or minimize the discharge of pollutants to stormwater while handling these potentially harmful materials, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. Please see the Safer Alternative Products section for additional information.
- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Protocols

General-

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Properly dispose of wash water, sweepings, and sediments.
- Recycle or dispose of fluids properly.
- Establish a daily or weekly checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Time frame should depend on how "dirty" the site can be. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy problems found.
- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).
- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

OBJECTIVES

- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a "before" audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.

- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

MEASURABLE GOALS

- # of staff trained or read this procedure.
- Record volumes of recycled materials or fluids per year.
- Record volumes of trash cleaned up per year.
- # of spill clean ups per year, if any.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

LANDSCAPE MAINTENANCE

OVERVIEW

Landscape maintenance include the following activities: vegetation removal, herbicide and insecticide application, fertilizer application, watering, and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) applications and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. To reduce or minimize the discharge of pesticides, herbicides, and fertilizers to the storm drain system and receiving waters, and to prevent the disposal of landscape waste into the storm drain system, please review and apply the following approaches, protocols, and requirements below.

APPROACH

Pollution Prevention

- Implement an Integrated Pest Management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping (planting native species) and xeriscaping (using drought tolerate plants).
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.
- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Protocols

Mowing, Trimming, and Weeding-

- Whenever possible use mechanical methods of vegetation removal (e.g. mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control; this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary and compost (see waste management section of this fact sheet).

- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness,maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g. irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do NOT dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.
- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do NOT put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates IPM techniques. There are many methods and types of IPM, including the following:

  -Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.

-Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water, or in some cases vacuumed off of larger plants.
-Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
-In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
-Small mammals and birds can be excluded using fences, netting, tree trunk guards.
-Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year, depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection-

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a Michigan qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.
- Employees who are not authorized and trained to apply pesticides should be periodically, at least annually, informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log, or similar method, to document training.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Not applicable.

MEASURABLE GOALS

- # of staff trained or read procedure.
- # of staff trained as pesticide applicators per year.
- Quantity of material composted per year (cubic yards, bushels, other measurements accepted).
- Implementation of new Integrated Pest Management projects and outcome.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

MATERIALS STORAGE, DPW YARD

OVERVIEW

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. Furthermore, raw material exposure has the following associated potential pollutant components: sediment nutrients, trash, oil and grease, organics and oxygen demanding elements. To prevent or reduce the discharge of pollutants to stormwater from the storage of contaminating materials, please review and apply the following approaches and requirements below.

APPROACH

	Material Name	**Handling and Storage Procedure**	**Potential for Discharge**
1	Vehicle Oil	1 qt bottles, 55 gallon steel drum, 100 gallon steel tank, inside shop area	low
2	Diesel Fuel	1000 gallons tank, outside double containment	low
3	Gasoline	1000 gallon tank, outside double containment, fire resistant tank	low
4	Hydraulic Fluids	55 gallon steel drums, indoor shop area	low
5	Antifreeze	55 gallon steel drum, indoor shop area	low
6	Rock Salt	1000 ton, indoor in barn located on impervious surface	low
7	Gravel	500-1000 ton limestone 21A, outdoor in pile	low
8	Sand	500-1000 ton, outdoor in pile	low
9	Windshield Solvent	1 gallon jugs as needed, indoor shop area	low
10	Paint	spray cans and 1-5 gallon jugs, indoor shop area	low
11	Cold Patch	1-10 tons, indoor in salt barn	low

Protocols

General-

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene, or hypalon should be used over all materials stored outside.
- Minimize inventory of raw materials.
- Minimize the amount of chemicals found outside of their original containers. Furthermore, label each container with the name of the chemical that is stored within.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basin to prevent erosion of the stockpiled material off site.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.
- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps, or store indoors.

Raw Material Containment-

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Inspection-

- Conduct monthly inspections of storage areas so that leaks and spills are detected as soon as possible.

- A comprehensive site inspection should be preformed twice a year including the inspection of all stormwater structures and non structural stormwater controls.

Training

- Employee education and training is mandatory and necessary for the understanding of the storage of raw materials along with how to conduct oneself in the occurrence of a chemical spill.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.

REQUIREMENTS

Maintenance

- Accurate and up to date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

MEASURABLE GOALS

- # of staff trained or read procedure.
- # of items now stored inside or shelters built for storage.
- # of BMPs repaired to improve storage areas.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

MATERIALS STORAGE, WASTE WATER TREATMENT PLANT

OVERVIEW

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. Furthermore, raw material exposure has the following associated potential pollutant components: sediment nutrients, trash, oil and grease, organics and oxygen demanding elements. To prevent or reduce the discharge of pollutants to stormwater from the storage of contaminating materials, please review and apply the following approaches and requirements below.

APPROACH

	Material Name	**Handling and Storage Procedure**	**Potential for Discharge**
1	Sludge	1.3 MG underground storage tanks, north end of WWTP property	low
2	Ferric Chloride	6,000 Gal fiberglass tank w/ containment pit	low
3	Chlorine	Sealed 55 Gal. drums	low
4	Polymers	Sealed 55 Gal. drums	low
5	Gas & Oil	Pint - 55 Gal Drums	low

<u>Protocols</u>

General-

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene, or hypalon should be used over all materials stored outside.
- Minimize inventory of raw materials.
- Minimize the amount of chemicals found outside of their original containers. Furthermore, label each container with the name of the chemical that is stored within.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basin to prevent erosion of the stockpiled material off site.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.

- Keep outdoor storage containers in good condition.
- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps, or store indoors.

Raw Material Containment-

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Inspection-

- Conduct weekly inspections of storage areas so that leaks and spills are detected as soon as possible.
- A comprehensive site inspection should be preformed twice a year including the inspection of all stormwater structures and non structural stormwater controls.

Training

- Employee education and training is mandatory and necessary for the understanding of the storage of raw materials along with how to conduct oneself in the occurrence of a chemical spill.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.

REQUIREMENTS

Maintenance

- Accurate and up to date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.

- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

MEASURABLE GOALS

- # of staff trained or read procedure.
- # of items now stored inside or shelters built for storage.
- # of BMPs repaired to improve storage areas.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

MATERIALS STORAGE, WATER TREATMENT PLANT

OVERVIEW

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. Furthermore, raw material exposure has the following associated potential pollutant components: sediment nutrients, trash, oil and grease, organics and oxygen demanding elements. To prevent or reduce the discharge of pollutants to stormwater from the storage of contaminating materials, please review and apply the following approaches and requirements below.

APPROACH

	Material Name	Handling and Storage Procedure	Potential for Discharge
1	Sulfuric Acid	Less than 1 gallon, indoors	low
2	Citric Acid	55 gall drum stored indoors, limited time, twice a year for a week	low
3	Sodiumhypochlorite	3,000 gallons stored indoors, bulk tank, locked building	low
4	Hydrofluosilic Acid	Typ. 100-500 gallons, 55 gallon drums, indoors, locked building	low

Protocols

General-

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene, or hypalon should be used over all materials stored outside.
- Minimize inventory of raw materials.
- Minimize the amount of chemicals found outside of their original containers. Furthermore, label each container with the name of the chemical that is stored within.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basin to prevent erosion of the stockpiled material off site.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.

- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps, or store indoors.

Raw Material Containment-

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Inspection-

- Conduct weekly inspections of storage areas so that leaks and spills are detected as soon as possible.
- A comprehensive site inspection should be preformed twice a year including the inspection of all stormwater structures and non structural stormwater controls.

Training

- Employee education and training is mandatory and necessary for the understanding of the storage of raw materials along with how to conduct oneself in the occurrence of a chemical spill.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.

REQUIREMENTS

Maintenance

- Accurate and up to date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.

- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

MEASURABLE GOALS

- # of staff trained or read procedure.
- # of items now stored inside or shelters built for storage.
- # of BMPs repaired to improve storage areas.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

NON-STORMWATER DISCHARGES

OVERVIEW

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain **with conditions**. These include car washing and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges, which may include process waste waters, cooling waters, wash waters and sanitary wastewater, can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges. To reduce or minimize non-stormwater discharges with associated constituents of sediment, nutrients, trash, metals, bacteria, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

The municipality or educational institution must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs the field staff must be trained to know what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Protocols

FIXED FACILITY

General-

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections-

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection to verify physical connections.
- Isolate problem areas and plug illicit discharge points.
- Inspect the path of floor drains in older buildings.

Visual Inspection and Inventory-

- Inventory and inspect each discharge point during dry weather once every five years.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Illegal Dumping-

- Regularly inspect and cleanup hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup companyy or Hazmat team may be necessary.
- Please refer to the Spill Prevention, Control & Cleanup section.

FIELD PROGRAM

General-

- Stencil or color code storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

Field Inspection-

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.

- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
  - -Is there evidence of spills such as paints, discoloring, etc.
  - -Are there any odors associated with the drainage system.
  - -Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Reporting-

- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement-

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  - -Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  - -Provide information regarding BMPs to the responsible party, where appropriate.
  - -Begin enforcement procedures, if appropriate.
  - -Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

<u>Spill Response and Prevention</u>

- Please refer to the Spill Prevention, Control & Cleanup section.

SUPPLEMENTAL INFORMATION

Further Detail of the BMP

What constitutes a "non-stormwater" discharge?-

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements-

- Current municipal NPDES permits require municipalities to effectively prohibit non- stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non- stormwater discharges are typically allowed:
  -Diverted stream flows;
  -Rising found waters;
  -Uncontaminated ground water infiltration
  -Uncontaminated pumped ground water;
  -Foundation drains;
  -Springs;
  -Water from crawl space pumps;
  -Footing drains;
  -Air conditioning condensation;
  -Flows from riparian habitats and wetlands;
  -Water line and hydrant flushing;
  -Landscape irrigation;
  -Planned and unplanned discharges from potable water sources;
  -Irrigation water;
  -Individual residential car washing; and
  -Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's Stormwater Pollution Prevention Initiative (SWPPI).

Illegal Dumping-

- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  -Responsible parties

MEASURABLE GOALS

- # of staff trained or read this procedure.
- # of No Dumping signs posted annually.
- # of illegal dumping incidents per year.
- # of illicit discharge per year reported by staff.
- # of enforcement actions per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

OUTDOOR CONTAINER STORAGE

OVERVIEW

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwater with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, ammonia, solvents, syrups, etc. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques. To reduce or minimize the discharge of pollutants from above ground liquid storage tanks, drums, and dumpsters with associated constituents of nutrients, metals, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Educate employees about pollution prevention measures and goals.
- Keep an accurate, up to date inventory of the materials delivered and stored on-site. Re-evaluate inventory needs and consider purchasing alternative products. Properly dispose of outdated products.
- Try to keep chemicals in their original containers, and keep them well labeled.

Protocols

General-

- Please refer to the Outdoor Loading and Unloading Section for more detailed BMP information pertaining to loading and unloading of liquids.
- Protect materials from rainfall, run-on, runoff, and wind dispersal:
  - -Cover the storage area with a roof.
  - -Minimize stormwater run-on by enclosing the area or building a berm around it.
  - -Use a "doghouse" structure for storage of liquid containers.
  - -Use covered dumpsters for waste product containers.
- Employ safeguards against accidental releases:
  - -Provide overflow protection devices to warn operator or automatic shut down transfer pumps.
  - -Provide protection guards (bollards) around tanks and piping to prevent vehicle or forklift damage, and
  - -Provide clear tagging or labeling, and restricting access to valves to reduce human error.

- Berm or surround tank or container with a secondary containment system using dikes, liners, vaults, or double walled tanks.
- Have registered and specifically trained professional engineers identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.

Storage Areas-

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guard rails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism.
- Place tight-fitting lids on all containers.
- Enclose or cover the containers where they are stored.
- Raise the containers off the ground by use of a spill pallet or similar method, with provisions for spill control and secondary containment.
- Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.

Container Management-

- Keep containers in good condition without corrosion or leaky seams.
- Place containers in a lean-to structure or otherwise covered to keep rainfall from reaching the drums.
- Replace containers if they are deteriorating to the point where leakage is occurring. Keep all containers undercover to prevent the entry of stormwater. Employees should be made aware of the importance of keeping the containers free from leaks.
- Keep waste container drums in an area such as a service bay. All drums should be inside and stored in a structure, or walk-in container.

Storage of Hazardous Materials-

- Storage of reactive, ignitable, or flammable liquids must comply with the fire and hazardous waste codes.
- Place containers in a designated area that is paved, free of cracks and gaps, and impervious in order to contain leaks and spills. The area should also be covered.
- Surround stored hazardous materials and waste with a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain and a dead-end sump should be installed in the drain.
- Structures that store hazardous materials should have proper labeling on the side of the structure indicating the types of hazardous materials in the building.

- All storage drums should have hazardous material labels.

Inspection-

- Provide regular inspections:

  -Inspect storage areas regularly for leaks or spills.

  -Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.

  -Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

  -Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.

  -Inspect tank foundations, connections,coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.

  -Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.

  -Label new or secondary containers with the product name and hazards.

Training-

- Train employees (e.g. fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees in proper storage measures.
- Use a training log or similar method to document training.

Spill Response and Prevention-

- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills, or know who to contact.
- Collect all spilled liquids and properly dispose of them.
- Employees trained in emergency spill cleanup procedures should be present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Operator errors can be prevented by using engineering safe guards and thus reducing accidental releases of pollutant.
- Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area.

REQUIREMENTS

<u>Maintenance</u>

- Conduct weekly inspections.

- Sweep and clean the storage area regularly if it is paved. Do NOT hose down the area to a storm drain.

MEASURABLE GOALS

- Maintain SWPPP inspections at designated time frame.
- # of employees trained or read this procedure.
- # of spills at outdoor containers per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

OUTDOOR EQUIPMENT MAINTENANCE

OVERVIEW

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. To reduce or minimize contaminated stormwater runoff from outside process equipment operations and maintenance with targeted constituents of sediment, trash, metals, oil and grease, and organics, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Perform the activity during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.

Protocols

- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer and/or oil and water separator.
- Cover the work area with a permanent roof.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention). If allowed, connect process equipment area to public sewer.
- Dry clean the work area regularly.

Training

- Train employees to perform the activity during dry periods only and to use less or non-toxic materials.
- Train employee and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Keep your Storm Water Pollution Prevention Plan (SWPPP) and Pollution Incident Prevention Plan (PIPP) updated, and implemented accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Conduct routine preventive maintenance, including checking process equipment for leaks.
- Clean the storm drain system regularly.

MEASURABLE GOALS

- #of maintenance procedures moved to inside.
- #of staff trained or read this procedure.
- # of spills reported and cleaned up related to this procedure.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

OUTDOOR LOADING AND UNLOADING

OVERVIEW

The loading and unloading of materials usually takes place outside on docks or terminals. Therefore, materials spilled, leaked, or lost during loading and/or unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. To reduce or minimize the discharge of pollutants to stormwater from the outdoor loading and unloading of material with associated constituents of sediment, nutrients, metals, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of materials with the potential to contaminate stormwater.
- Prevent stormwater run-on.
- Regularly check equipment for leaks.
- When loading and unloading, an attendant should be present at all times.

Protocols

Loading and Unloading: General Guidelines-

- Do not conduct loading and unloading during wet weather, whenever possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.

- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a dead-end sump.

Inspection-

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g. fork lift operators) and contractors on proper spill containment and cleanup.
- Employees trained in spill containment and cleanup should be present during the loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1st of each year.

MEASURABLE GOALS

- # of staff trained or read this procedure.
- # of materials removed from storage on site.
- # of improvements to loading and unloading materials.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

OUTDOOR STORAGE OF RAW MATERIALS

OVERVIEW

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. Furthermore, raw material exposure has the following associated potential pollutant components: sediment, nutrients, trash, oil and grease, organics and oxygen demanding elements. To prevent or reduce the discharge of pollutants to stormwater from the delivery and storage of raw materials, please review and apply the following approaches and requirements below.

APPROACH

Protocols

General-

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene, or hypalon should be used over all materials stored outside.
- Minimize inventory of raw materials.
- Minimize the amount of chemicals found outside of their original containers. Furthermore, label each container with the name of the chemical that is stored within.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basin to prevent erosion of the stockpiled material off site.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.
- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps, or store indoors.

Raw Material Containment-

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Inspection-

- Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.

Training

- Employee education and training is mandatory and necessary for the understanding of the storage of raw materials along with how to conduct oneself in the occurrence of a chemical spill.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.

REQUIREMENTS

Maintenance

- Accurate and up to date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

MEASURABLE GOALS

- # of staff trained or read procedure.
- # of items now stored inside or shelters built for storage.
- # of BMPs repaired to improve storage areas.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

PARKING/STORAGE AREA MAINTENANCE

OVERVIEW

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. To prevent and reduce the discharge of pollutants from parking/storage areas, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots.
- Keep accurate maintenance logs to evaluate BMP implementation.

Protocols

General-

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter-

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning-

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used, follow the procedures below:
  - -Block the storm drain or contain runoff.
  - -Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface. Do NOT allow wash water to enter storm drains.
  - -Dispose of parking lot sweeping debris and dirt at a landfill.

- When cleaning heavy oil deposits:
  -Use absorbent materials on oily spots prior to sweeping or washing.
  -Dispose of used absorbents appropriately.

Surface Repair-

- Pre-heat, transfer, or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until the job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection-

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding the cleaning of paved areas and the proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

MEASURABLE GOALS

- # of staff trained or read procedure.
- Volume of trash and sediment swept from parking or storage areas annually.

- # of municipal parking or storage sites swept per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

PLAZA AND SIDEWALK CLEANING

OVERVIEW

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. To reduce or minimize the amount of pollutants discharging into stormwater during plaza and sidewalk cleaning with targeted constituents of sediment, trash, metals, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements for good housekeeping practices, found below.

APPROACH

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels, or sprays for graffiti removal).

Protocols

Surface Cleaning-

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain, or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)
- Block the storm drain or contain runoff when washing parking areas, driveways, or drive-through areas.
- Use absorbents to pick up oil; then dry sweep. Clean with or without soap.
- Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal-

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under the Painting and Paint Removal section in the Road and Street Maintenance BMPs for Roads, Streets, and Highway Operation and Maintenance when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning

compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair-

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for cleanup and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from the site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do NOT dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair-

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sandbags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter-

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Not applicable.

MEASURABLE GOALS

- #of staff educated or read this procedure.
- # of sites maintained during the past year.
- # of sites cleaned / swept during the past year and volume of refuse/sediment removed.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

RAIN GARDEN MAINTENANCE

OVERVIEW

A small amount of maintenance every several weeks makes a big difference in the appearance of rain garden. Regular maintance saves time and money and helps keep the garden looking its best.

APPROACH

Pollution Prevention

- Never use pesticides on rain gardens.
- Choose plants that stabilize soil and thrive in water or wet soils.

Protocols

Edging

- A clean break should be maintained between the edge of the rain garden and the surrounding grass. Without a clean edge, grass roots will grow into the rain garden, competing with desirable rain garden plants for water and nutrients.
- Choices for edging include:
    - "V Notch" edge – made with a shovel to create a gap between the lawn and rain garden.
    - Landscape hard edge, such as black plastic (note that if not installed properly plastic edging can pop out in the freeze-thaw cycle in winter.
- Edging should be checked twice a year, in the spring and again in the fall.

Weeding

The rain garden is a fertile bed and weed seeds may blow in and grow.

- Weeding should be done regularly throughout the growing season. The specific weeding schedule should be determined by the current weather.

Cutting Down Stalks

Some rain garden plants dry out and turn brown in the fall. If the brown plants become unsightly and/or cause complaints, the brown plants can be cut off at the base.

- Stems and spent flowers can be chopped up and composted.
- Alternately brown stalks and seed heads can be left to provide food for birds and winter interest.
- If stalks are to be cut down that should happen in either the fall or the spring before new growth emerges.

Planting, Transplanting and/or Thinning

- If it is needed to move plants to different locations, to divide large plants, to remove overgrown plants, and/or to add new plants, do so in the fall well before the first freeze.
- After planting or transplanting, water well every other day for 2 weeks or more.

Mulch with a Natural Organic Material

Mulching is essential for rain garden maintenance. Natural organic mulch, such as pine bark, cedar shavings, or other natural material is recommended. Natural organic mulches decompose and add organic matter back into the soil system. The organic matter in the soil helps absorb water and break down any pollutants which may wash into the rain garden.

- Apply a 2-to-3-inch layer of mulch.
- The mulch layer should be checked in the spring and again in the fall.
- Mixing various types of natural mulch is recommended.

Training

- Provide regular training to field employees and/or contractors regarding rain garden maintenance.
- Use a training log or similar method to document training.

REQUIREMENTS

Maintenance

- Biannual inspections.
- Maintance procedures as mentioned within this Standard Operating Procedure.

MEASURABLE GOALS

- #of staff educated or read this procedure.
- # of sites maintained during the past year.

REFERENCES

Rain Garden Maintenance brochure provided by the DPS staff.

ROAD AND STREET MAINTENANCE

OVERVIEW

Streets, roads, and highways are significant sources of pollutants in stormwater discharges, and operation and maintenance (O&M) practices, if not conducted properly, can contribute to the problem. Stormwater pollution from roadway and bridge maintenance should be addressed on a site-specific basis. To reduce or minimize the discharge of pollutants to stormwater during road and street maintenance and operation practices with targeted constituents of sediments, trash, metals, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).
- Recycle paint and other materials whenever possible.
- Enlist the help of citizens to keep yard waste, used oil, and other wastes out of the gutter.

Protocols

Street Sweeping and Cleaning-

- Maintain a consistent sweeping schedule.
- Perform street cleaning during dry weather if possible.
- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. For example:

  -Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.

  -Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.

  -Increase the sweeping frequency for streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferably regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:

-Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
-Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
-Develop and distribute flyers notifying residents of street sweeping schedules.

- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season, or make sure debris piles are contained (e.g. by berming the area), or covered (e.g. with tarps or permanent covers).

Street Repair and Maintenance-

Pavement Marking

- Schedule pavement marking activities for dry weather.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sand bags around inlets or work areas).

- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain.
- Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- When making saw cuts in pavement,use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel darns around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Patching, Resurfacing, and Surface Sealing

- Schedule patching, resurfacing and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets, or watercourses.
- During wet weather, cover stockpiles with plastic tarps, or berm, around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer, or load hot bituminous material away from drainage systems, or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for cleanup and proper disposal of excess materials.
- Use only as much water as necessary for dust control to avoid runoff.
- Sweep, never hose down, streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do NOT dump vacuumed liquid in storm drains.

- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment Cleaning Maintenance and Storage

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

Bridge and Structure Maintenance-

Paint and Paint Removal

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when job is completed.
- If sand blasting is used to remove paint, cover any nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all clean-up water and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Graffiti Removal

- Schedule graffiti removal activities for dry weather.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.

- When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal above.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If such an area is not available, filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles, and debris out of storm drains.
- If a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump wash water to the sanitary sewer.
- Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

Repair Work

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods (depending on the type of surface) outlined in the Plaza & Sidewalk Cleaning section.
- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, follow the graffiti removal procedures above.
- Recycle materials whenever possible.

Unpaved Roads and Trails

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- Dust suppressants should be used to minimize airborne transfer of fine aggregates into the air.
- Quality aggregates should be used to minimize transfer of fine aggregates onto paved surfaces.
- For roadside areas with exposed soils, the most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a common straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include the following: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales stacked in place.

Non-Stormwater Discharges-

Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

- Please refer to the Non-Stormwater Discharges section.
- Identify the location, time and estimated quantity of discharges.
- Notify appropriate personnel.

Training

- Train employees regarding proper street sweeping operation and street repair and maintenance.
- Instruct employees and subcontractors to ensure that measures to reduce the stormwater impacts of roadway/bridge maintenance are being followed.
- Require engineering staff and/or consulting A/E firms to address stormwater quality in new bridge designs or existing bridge retrofits.
- Use a training log or similar method to document training.
- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Keep your Storm Water Pollution Prevention Plan (SWPPP) and/or Pollution Incident Prevention Plan (PIPP) up to date and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Not applicable.

MEASURABLE GOALS

- # of staff trained or read this procedure.
- Quantities of trash or sediment cleaned from sites annually.
- # of sites maintained per year.
- Date and types of non-stormwater discharges annually from this procedure.
- Street sweeping quantities per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

SAFER ALTERNATIVE PRODUCTS

OVERVIEW

Promote the use of less harmful products. There are alternatives that exist for most product classes including the following: chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps). In order to reduce and minimize the use of the harmful products, please review and apply the following approaches and requirements below.

APPROACH

Develop a comprehensive program based on the following:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
    - -Standard operating procedures (SOPs)
    - -Purchasing guidelines and procedures
    - -Bid packages (services and supplies)
- Materials
    - -Preferred or approved product and supplier lists
    - -Products and supplier evaluation criteria
    - -Training sessions and manuals
    - -Fact sheets for employees

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances.

Regulations

This **BMP** has no regulatory requirements. It is encouraged to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Stormwater runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major requirements to this BMP.

MEASURABLE GOALS

- #of staff trained or read this procedure.
- Number and types of products replaced with nontoxic types of cleaners.
- Involvement in municipal preferable purchasing program.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

SALT APPLICATION AND STORAGE

OVERVIEW

The application and storage of de-icing materials, most commonly salts such as sodium chloride, can lead to water quality problems for surrounding areas. Salts, and other materials are applied to highways and roads to reduce the amount of ice during winter storm events. Salts lower the melting point of ice, allowing roadways to stay free of ice buildup during cold winters. To reduce or minimize water quality problems from the application and storage of salts with targeted constituents of sediment, nutrients, metals, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPRAOCH

During road salt application, certain best management practices can produce significant environmental benefits. The amount of road salt applied should be regulated to prevent over-salting of motorways and increasing runoff concentrations. The amount of salt applied should be varied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters. Calibration devices for spreaders in trucks aid maintenance workers in the proper application of road salt.

Pollution Prevention

- Use the minimum amount of salt needed to get the job done.
- Establish "low salt" near sensitive environments. Salt can impact water supply wells.
- Establish "low salt and/or sand areas" near sensitive environments. Sand may be detrimental in areas sensitive to sedimentation, such as streams, and salt can impact water supply wells.
- Remove snow manually from driveways and sidewalks.
- Limit toxic metals in specifications for deicers.
- Cleanup road grit as soon as possible.
- Use less harmful de-icers such as calcium magnesium acetate, potassium acetate, or organic deicers.
- Consider road temperatures when determining volume of salt to apply.
- Control the rate of spreading by equipping trucks with ground-speed sensors.
- Many of the problems associated with contamination of local waterways stem from the improper storage of de-icing materials. Salts are very soluble when they come into contact with storm water. They can migrate into ground water used for public water supplies and also contaminate surface waters.
- Storage facilities should be located on flat sites away from surface water and on impervious surfaces that are easily protected from overland runoff.
- Salt should be stored under cover to prevent a loss due to runoff.
- Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
- Place salt piles in areas not subject to flooding.

- Cover salt piles with a tarp (polyethylene) during non-freezing spring and summer months when storage facilities are not available.
- Contain stormwater runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
- Use diversion berms to minimize run-on to storage areas.
- Cleanup "track out" after storm events.

Protocols

- Sensitive areas, such as public water supplies, lakes and ponds, should be identified and made known to salt applicators. Consider de-icing alternatives in sensitive areas.
- Ground-speed controllers should be used for all spreaders.
- Give salt time to work; time plowing operations to allow maximum melting by salt, before snow is plowed off the highway.
- When temperatures are below 0°F, beet juice can be used if necessary.
- Know when to plow and re-apply salt. The need for another salt application can be determined by watching melting snow kicked out behind vehicle tires. If the slush is soft and fans out like water, the salt is still working. Once the slush begins to stiffen and is thrown directly to the rear of vehicle tires, it is time to plow.
- For lesser traveled roads, consider applying salt in a windrow in a four to eight foot strip along the centerline of a two lane road. Less salt is wasted with this pattern and quickly gives vehicles clear pavement under at least two wheels. Traffic will soon move some salt off the centerline and the salt brine will move toward both shoulders for added melting across the entire road width.
- Determine levels of service for all roads in a service area. Salt application rates and frequency should be based on traffic volume, road grade and curvature, intersections, and weather conditions. Sand or sand/salt mix should be used based on the level of service requirements.
- Calibration of spreaders should be done at the beginning of the winter season to the manufacture's recommendations.

Training

- Train drivers to improve loading of materials, application techniques and reduce losses.
- Train drivers to report areas of "over salting" to allow possible cleanup and to reduce salt runoff.
- Train staff to sweep up excess salt from loading / unloading areas that are exposed to weather.

MEASURABLE GOALS

- Quantities of salt and brine products used per year.
- Type of weather year encountered.
- # of salt applicators calibrated per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

SPILL PREVENTION, CONTROL & CLEANUP

OVERVIEW

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment. To reduce or minimize spills and leaks with associated constituents of nutrients, metals, oil and grease, organics, and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Product substitution- use less toxic materials (i.e. use water based paints instead of oil based paints).
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Protocols

Spill/Leak Prevention Measures-

- If possible move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain cannot come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.
- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard

where leaks and spill are easier to control.

- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that ifa spill occurs, the material will be contained.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).
- Follow the SWPPP or PIPP if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and cleanup personnel.

Spill Cleanup Procedures-

- **Small non-hazardous spills**

  - Use a rag, damp cloth, or absorbent materials for general cleanup of liquids.
  - Use brooms or shovels for the general cleanup of dry materials.
  - If water is used, it must be collected and properly disposed of. The wash water cannot be allowed to enter the storm drain.
  -Dispose of any waste materials properly.
  -Clean or dispose of any equipment used to clean up the spill properly.

- **Large non-hazardous spills**

  -Use absorbent materials for general cleanup of liquids.
  -Use brooms, shovels, or street sweepers for the general cleanup of dry materials.
  - If water is used, it must be collected and properly disposed of. The wash water cannot be allowed to enter the storm drain.
  -Dispose of any waste materials properly.

-Clean or dispose of any equipment used to clean up the spill properly.

- **For hazardous or very large spills,** a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting-

- Report any spills immediately to the identified key municipal spill response personnel.
- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to 911, the Pollution Emergency Alerting System (PEAS) at 800-292-4706 and the National Response Center (NRC) at 800-424-8802.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures.

REQUIREMENTS

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

SUPPLEMENTAL INFORMATION

Further Detail of the BMP

Reporting-

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

MEASURABLE GOALS

- #of staff trained or read procedure per year.
- #of spills reported on municipal sites per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

VEHICLE AND EQUIPMENT CLEANING

OVERVIEW

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, trash, metals, sediments, phosphates, heavy metals, and suspended solids to stormwater runoff. To reduce or minimize the discharge of pollutants to stormwater during vehicle and equipment cleaning, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.
- Good housekeeping practices can minimize the risk of contamination from wash water discharges.

Protocols

General-

- All Vehicle washing should be done indoors.
- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate.
- Mark the area clearly as a wash area.
- Post sign' stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited.
- Provide a trash container in wash area.
- Emphasize the connection between the storm drain system and runoff and help reinforce that vehicle/equipment washing activities can have an effect on local water quality. This can be accomplished through storm drain stenciling programs.

Vehicle and Equipment Cleaning-

- Design wash areas to properly collect and dispose of wash water when engine cleaning is conducted and when chemical additives, solvents, or degreasers are used. This may include installation of sumps or drain lines to collect wash water.
- When washing vehicles:

  -Use designated indoor wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. Floor drains should only go to the sanitary sewer system. If washing must be done outdoors it may only be done in the designated area at the DPW, atop a concrete apron where the drain is part of the sanitary system.
  -Oil changes and other engine maintenance cannot be conducted in the

designated washing area. Perform these activities in a place designated for such activities.

- Use hoses with nozzles that automatically turn off when left unattended.
- Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as wellhead protection areas for public water supply.

Disposal-

- Consider filtering and recycling wash water.
- Discharge vehicle/equipment wash water to (1) the sanitary sewer, a holding tank, or process treatment system or (2) an enclosed recycling system.

Training

- Train employees on proper cleaning and wash water disposal procedures and conduct "refresher" courses on a regular basis.
- Train staff on proper maintenance measures for the wash area.
- Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Berm repair and patching, as necessary.
- Sweep washing areas frequently to remove solid debris.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

MEASURABLE GOALS

- #of staff trained or read procedure annually.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

VEHICLE AND EQUIPMENT FUELING

OVERVIEW

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. Implementing the following management practices towards the targeted constituents of trash, metals, oil and grease and organics can help prevent fuel spills and leaks.

APPROACH

Pollution Prevention

- Use properly maintained offsite fueling stations whenever possible. These businesses are better equipped to handle fuel and spills properly.
- Focus pollution prevention activities on containment of spills and leaks, most of which may occur during liquid transfers.

Protocols

General-

- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Label drains within the facility boundary, by paints/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.
- Post signs to remind employees not to top off the fuel tank when filling and signs that ban employees from changing engine oil or other fluids at that location.
- Report leaking vehicles to fleet maintenance.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas. Proper maintenance of these devices is necessary.
- Accumulated non-contaminated stormwater (e.g., in a secondary containment) should be released prior to next storm.
- Ensure the following safeguards are in place:
  - Overflow protection devices on tank systems to warn the operator to automatically shutdown transfer pumps when the tank reaches full capacity.
  -Protective guards around tanks and piping to prevent vehicle or forklift damage.
  - Clearly tagging or labeling all valves to reduce human error.
  - Automatic shut off for severed fuel hoses.

Fuel Dispensing Areas-

- Maintain clean fuel-dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills. Do not wash down areas with water.
- Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of the State.
- Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Design fueling area to prevent stormwater runoff and spills.
- Cover fueling area with an overhanging roof structure or canopy so that precipitation cannot come in contact with the fueling area and if possible use a perimeter drain or slope pavement inward with drainage to a blind sump (must be properly maintained and water properly disposed of); pave area with concrete rather than asphalt.
- Apply a suitable sealant that protects the asphalt from spilled fuels in areas where covering is infeasible and the fuel island is surrounded by pavement.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Cover storm drains in the vicinity during transfer.

Outdoor Waste Receptacle Area-

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Minimize the possibility of stormwater pollution from outside waste receptacles by using an effective combination of the following:
  - -use only watertight waste receptacle(s) and keep the lid(s) closed, or
  - -grade and pave the waste receptacle area to prevent run-on of stormwater, or
  - -install a roof over the waste receptacle area.
- Post "no littering" signs.

Inspection-

- Aboveground Tank Leak and Spill Control:
  - -Check for external corrosion and structural failure.
  - -Check for spills and overfills due to operator error.
  - -Check for failure of piping system.
  - -Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
  - -Periodically, integrity testing should be conducted by a qualified professional.

- Inspect and clean, if necessary, storm drain inlets and catch basins within the facility boundary before October 1st each year.

Training

- Educate employees about pollution prevention measures and goals.
- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Make sure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Train employees on proper fueling and cleanup procedures.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Spill Response and Prevention

- Keep your Pollution Incident Prevention Plan (PIPP) up to date, if applicable.
- Place stockpiles of spill cleanup materials where they are readily accessible.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly and dispose properly.
- Store portable absorbent booms (long flexible shafts or barriers made of absorbent material) in unbermed fueling areas.
- Report spills promptly.
- Install an oil/water separator and connect to the sanitary sewer (if allowed), if a dead-end sump is not used to collect spills.

REQUIREMENTS

Maintenance

- Clean oil/water separators at appropriate intervals.
- Keep ample supplies of spill cleanup materials onsite.
- Inspect fueling areas, storage tanks, catch basin inserts, containment areas, and drip pans on a regular schedule.

MEASURABLE GOALS

- # of staff trained or read procedure annually.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

VEHICLE AND EQUIPMENT REPAIR

OVERVIEW

Vehicle or equipment maintenance and repair is potentially a significant source of stormwater pollution, due to the use of materials and wastes created that are harmful to humans and the environment. Engine repair and service (e.g. parts cleaning), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. To reduce or minimize the discharge of pollutants to stormwater during vehicle and equipment maintenance and repair activities with associated constituents of metals, oil and grease, and organics, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials use.
- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible.
- Keep an accurate, up to date inventory of materials.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- Perform equipment repair indoors in designated areas.

Protocols

General-

- Move maintenance and repair activities indoors.
- Store idle equipment containing fluids under cover.
- Use a vehicle maintenance area designed to prevent stormwater pollution- minimize contact of stormwater with outside operations through appropriate drainage routing.
- Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer.
- Stencil or color code storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Post signs at sinks to remind employees not to pour hazardous wastes down drains.
- Do not pour materials down drains or hose down work areas; use dry sweeping.

Material and Waste Handling-

- Store materials and wastes under cover whenever possible.

- Designate a special area to drain and replace motor oil, coolant, and other fluids. This area should not have any connections to the storm drain or the sanitary sewer and should allow for easy clean up of drips and spills.
- Drain all fluids from wrecked vehicles immediately. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- Do NOT pour liquid waste to flood drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do NOT dispose of used or leftover cleaning solutions, solvents, and automotive fluids and oil in the sanitary sewer.
- Dispose of all waste materials according to applicable laws and regulations.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums and store in an appropriate designed area that can contain spills. Don't leave drip pans or other open containers lying around.
- Do not dispose of oil filters in trash cans or dumpsters, which may leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Most municipalities prohibit or discourage disposal of these items in solid waste facilities. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked and/or dead batteries in a non-leaking covered secondary container and dispose of properly at recycling or household hazardous waste facilities.

Maintenance and Repair Activities-

- Provide an indoor designated area for vehicle maintenance.
- Keep equipment clean; don't allow excessive build-up of oil and grease.
- Perform all vehicle fluid removal or changing inside to prevent the run-on of stormwater and the runoff of spills:

  -Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.

  -Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.

  -Keep drip pans or containers under vehicles or equipment that might drip during repairs.

  -Do not change motor oil or perform equipment maintenance in non-appropriate areas.

- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.

- Monitor parked vehicles closely for leaks and place pans under and leaks to collect the fluids for proper disposal or recycling.

Parts Cleaning-

- Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.
- Discharge wastewater generated from steam cleaning and pressure washing to an appropriate treatment control that is connected to a blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Please refer to the Waste Handling and Disposal Section for more information on steam cleaning.
- Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

Inspection-

- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Make sure incoming vehicles are checked for leaking oil and fluids. Apply controls accordingly.

Training

- Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business). The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section for additional information.
- Place adequate stockpiles of spill cleanup materials where they are readily accessible.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Use the following three-step method for cleaning floors:
  -Clean spills with rags or other cleaning materials.
  -Sweep floor using dry absorbent material.
  -Mop the floor. Mop water may be discharged to the sanitary sewer via a toilet or sink.
- Remove absorbent materials used for cleaning small spills promptly and properly.

- Do not saturate rags or absorbent material to eliminate need for disposal of spilled material as hazardous waste.

REQUIREMENTS

Maintenance

- Sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do NOT hose down the area to a storm drain.

MEASURABLE GOALS

- # of staff trained or read procedure annually.
- Other SOPs measurable goals cover the housekeeping of this adequately.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

WASTE HANDLING & DISPOSAL (SOLID WASTE)

OVERVIEW

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, sediment, trash, bacteria, organics, nutrients,suspended solids, oxygen demanding elements, and other pollutants to enter stormwater runoff. To prevent and reduce the discharge of pollutants to stormwater from waste handling and disposal, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Reduction in the amount of waste generated can be accomplished using the following source controls such as:
  - -Production planning and sequencing
  - -Process or equipment modification
  - -Raw material substitution or elimination
  - -Loss prevention and housekeeping
  - -Waste segregation and separation
  - -Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

Protocols

General-

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do NOT hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do NOT discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.

- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter-

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection-

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping-

- Use the entire product before disposing of the container.
- Keep the waste management areas clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through a grease interceptor to the sewer.
- Stencil or color code storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes-

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Run-on/Runoff Prevention-

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters at all times, or at the end of a work day to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection-

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train employees in pollution prevention measures and proper disposal methods.
- Train employees to keep covered dumpsters closed at all times.
- Train employees and contractors proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Please refer to the Spill Prevention, Control & Cleanup section.
- Keep your Pollution Incident Prevention Plan (PIPP) updated, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Vehicles transporting waste should have spill prevention equipment that can prevent spills during transport. The spill prevention equipment includes the following:
  -Vehicles equipped with baffles for liquid waste.
  -Trucks with sealed gates and spill guards for solid waste.

Other Considerations

- Hazardous waste cannot be re-used or recycled; it must be disposed of by a licensed hazardous waste hauler.

MEASURABLE GOALS

- # of staff trained or read procedure.
- Quantities of solid waste disposed of annually.
- Quantities of liquid waste disposed of annually.
- Participation in MidMichigan Solid Waste / Hazardous waste / Electronic waste collection annually.
- # of collection programs advertised per year in newspapers, newsletters, or on website.
- # of "No Littering" signs posted per year and locations.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

WASTE HANDLING AND DISPOSAL

OVERVIEW

It is important to control litter on a site in order to eliminate trash and other materials in stormwater runoff. Waste reduction is a major component of waste management and should be encouraged through training and public outreach. Management of waste once it is collected may involve reuse, recycling, or proper disposal. To reduce or minimize the amount of trash and waste in stormwater runoff with associated constituents of sediment, nutrients, trash, metals, bacteria, oil and grease, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPROACH

Pollution Prevention

- Reuse products when possible.
- Encourage recycling programs with recycling bins, used oil collection, etc.

Protocols

Solid Waste Collection-

- Implement procedures, where applicable, to collect, transport, and dispose of solid waste at appropriate disposal facilities in accordance with applicable federal, state, and local laws and regulations.
- Include properly designed trash storage areas. If feasible, provide cover over trash storage areas.
- Regularly inspect solid waste containers for structural damage. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (please see the chemical/hazardous waste collection section, below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
- Please refer to the Waste Handling and Disposal (solid waste) section for more information regarding solid waste facilities.

Waste Reduction and Recycling-

- Recycle wastes whenever possible. Many types of waste can be recycled; recycling options for each waste type is limited. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be recycled should either be incinerated or disposed of at a properly permitted landfill.

- Recycling is always preferable to disposal of unwanted materials.
- Recycling bins for glass, metal, newspaper, plastic bottles and other recyclable household solid wastes should be provided at public facilities and/or for residential curbside collection.

Controlling Litter-

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Clean out and cover litter receptacles frequently to prevent spillage.

Illegal Dumping-

Substances illegally dumped on streets and into the storm drain system and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes.

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Landscaping and beautification efforts of hot spots might also discourage future dumping.
- Please see the Drainage System Maintenance and Non-Stormwater Discharges sections for additional information.

REQUIREMENTS

Maintenance

- The primary staff demand for stenciling programs is for program setup to provide marketing and training. Ongoing/follow-up staff time is minimal because of volunteer services.
- Staffing requirements are minimal for oil recycling programs if collection/recycling is contracted out to a used oil hauler/recycler or required at commercial locations.
- Staff requirements for maintaining good housekeeping BMPs at waste handling sites is minimal.
- Manifest of waste collected, includes dates, quantities, types of wastes, etc. should be kept on record.

MEASURABLE GOALS

- # of staff trained or read procedure.
- Quantities of solid waste disposed of annually.
- Quantities of liquid waste disposed of annually.
- Participation in MidMichigan Solid Waste / Hazardous waste / Electronic waste collection annually.
- # of collection programs advertised per year in newspapers, newsletters, or on website .
- # of "No Littering" signs posted per year and locations.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

WATER & SEWER UTILITY MAINTENANCE

OVERVIEW

Although the operation and maintenance of public utilities are not considered chronic sources of stormwater pollution, some activities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Cities that do not provide maintenance of water and sewer utilities must coordinate with the contracting agency or contractor responsible for these activities and ensure that the following model procedures, requirements and protocols, with targeted constituents of sediment, nutrients, bacteria, oil and grease, organics and oxygen demanding elements, are followed.

APPROACH

Pollution Prevention

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe-up liquids, including oil spills).

Protocols

Water Line Maintenance and Cleaning-

Procedures can be employed to reduce pollutants from discharges associated with water utility operation and maintenance activities. Planned discharges may include fire hydrant testing, flushing water supply mains after new construction, flushing lines due to complaints of taste and odor, dewatering mains for maintenance work. Unplanned discharges from treated, recycled water, raw water, and groundwater systems operation and maintenance activities can occur from water main breaks, sheared fire hydrants, equipment malfunction, and operator error.

Planned Discharges-

- Identify a suitable discharge option in the following order of preference:
  - -Apply to the land.
  - -Reuse water for dust suppression, irrigation, or construction compaction.
  - -Discharge to a sanitary sewer system with approval.
  - -Discharge to the storm drain system using applicable pollution control measures. (Only available to clean water discharges such as water main/water storage tank/water hydrant flushing), see NON-STORMWATER DISCHARGES procedure for water that can be discharged to a storm water system.
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain protection options include the following:
  - -Silt fence- Appropriate where the inlet drains a relatively flat area.

-Gravel and wire mesh sediment filter- Appropriate where concentrated flows are expected.

-Wooden weir and fabric- Use at curb inlets where a compact installation is desired.

-Other commercially available devices for controlling sediment.

- Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe-up liquids, including oil spills).
- General Design considerations for inlet protection devices include the following:

  -The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.

  -Devices should be constructed to that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications must be made.

Unplanned Discharges-

- Stop the discharge as quickly as possible.
- Inspect the flow path of the discharged water:

  -Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions.

  -Identify the potential for pollutants to be washed into the waterway.
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

Sanitary Sewer Maintenance-

This section is applicable to municipalities who own and operate a sewage collection system. Facilities that are covered under this program include sanitary sewer pipes and pump stations owned and operated by a municipality. The owner of the sanitary sewer facilities is the entity responsible for carrying out this prevention and response program.

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- Establish a routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas, such as restaurants, that are identified.
- Cleaning activities may require removal of tree roots and other identified obstructions.
- During routine maintenance and inspection, note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:

-Cracked/deteriorating pipes
-Leaking joints/seals at manhole
-Frequent line plugs
-Line generally flows at or near capacity
-Suspected infiltration or ex-filtration.

- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring, or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
- Review previous sewer maintenance records to help identify "hot spots", or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows-

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.
- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys (please see the Drainage System Operation and Maintenance section).
- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen's hotline or other established phone number for reporting observed overflow conditions should be established to supplement field screening efforts. This phone number should be Prominently Displayed on the community website HOME PAGE to find easily.
- Establish a lead department/agency responsible for spill response and containment. Provide coordination within departments.
- When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drain system or receiving waters. Methods may include:
  -Blocking storm drain inlets and catch basins.
  -Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures. (using sandbags, inflatable dams, etc.)
  -Removing the material with vacuum equipment.
- Record required information at the spill site.
- Perform field tests as necessary to determine the source of the spill.
- Develop notification procedures regarding spill reporting.

Septic Systems-

- Ensure that homeowners, installers, and inspectors are educated in proper maintenance of septic systems. This may require coordination with staff from other departments. Outreach to homeowners should include inspection

reminders informing them that inspection, and perhaps maintenance, is due for their systems. Recommend that the system be inspected annually and pumped-out regularly.

- Programs which seek to address failing septic systems should consider using field screening to pinpoint areas where more detailed onsite inspection surveys are warranted.

Training

- Conduct annual training of water utility personnel or service contractors. (field screening, sampling, smoke/dye testing, TV inspection)
- OSHA-required Health and Safety Training 29 CFR 1910.120 plus annual Refresher Training (as needed).

Spill Response and Prevention

- See previous section regarding spills and overflows.
- Please refer to the Spill Prevention, Control & Cleanup section.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

REQUIREMENTS

Maintenance

- Minimum 2-person teams to perform field screening and associated sampling.
- Larger teams required for implementing other techniques (i.e. smoke testing, fluorometric dye testing, television camera inspection, and physical inspection with confined space entry) to identify sewer system leaks.
- Program coordination required for handling emergencies, record keeping, etc.
- Many of the problems associated with improper use of septic systems may be attributed to lack of user knowledge on operation and maintenance. Educational materials for homeowners and training courses for installers and inspectors can reduce the incidence of pollution from these widespread and commonly used pollution control devices.

NOTE: Many communities implemented stringent IPP programs in the 1980s and 1990s to eliminate many problems related to illicit connections and cross connections.

MEASURABLE GOALS

- # of staff trained or read procedure
- Length of Water or Sanitary line, forcemain replacement or repair annually
- # of brochures handed out annually related to onsite septic disposal systems

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

WINTER ROAD MAINTENANCE

OVERVIEW

Snow removal as well as the application and storage of de-icing materials, most commonly salts such as sodium chloride, can lead to water quality problems for surrounding areas. Salts, and other materials are applied to highways and roads to reduce the amount of ice during winter storm events. To reduce or minimize water quality problems from the placement of snow removed from roadways and the application and storage of salts with targeted constituents of sediment, nutrients, metals, organics and oxygen demanding elements, please review and apply the following approaches and requirements below.

APPRAOCH

During inclement winter weather certain best management practices can produce significant environmental benefits. The procedure and placement of snow removed from roadways and the amount of road salt applied should be regulated to prevent contaminated runoff concentrations. The amount of salt applied should be varied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters. Calibration devices for spreaders in trucks aid maintenance workers in the proper application of road salt. Not all snow events will require all or any winter road maintenance. The City has standard procedures for types of events.

Pollution Prevention

- All snow removal vehicles and equipment should be properly inspected and calibrated (if needed) prior to the winter season.
- No snow or ice removed from private property should be deposited on public property.
- Streets are prioritized for snow plowing based on traffic counts.
- Snow removed from pavement should be stockpiled in centralized locations where there is no direct runoff to the storm system.
- Removed snow should not be stockpiled near water bodies and/or direct discharges to water bodies.
- Remove snow manually from driveways and sidewalks.
- Use the minimum amount of salt needed to get the job done.
- Establish "low salt" near sensitive environments. Salt can impact water supply wells.
- Establish "low salt and/or sand areas" near sensitive environments. Sand may be detrimental in areas sensitive to sedimentation, such as streams, and salt can impact water supply wells.
- Limit toxic metals in specifications for deicers.
- Consider pre-wetting of salt or use brine solution as a way to reduce and better control salt applications.
- Use less harmful de-icers such as calcium magnesium acetate, potassium acetate, or organic deicers.
- Consider road temperatures when determining volume of salt to apply.
- Control the rate of spreading by equipping trucks with ground-speed sensors.

- Many of the problems associated with contamination of local waterways stem from the improper storage of de-icing materials. Salts are very soluble when they come into contact with storm water. They can migrate into ground water used for public water supplies and also contaminate surface waters.
- Storage facilities should be located on flat sites away from surface water and on impervious surfaces that are easily protected from overland runoff.
- Salt should be stored under cover to prevent a loss due to runoff.
- Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
- Place salt piles in areas not subject to flooding.
- Contain stormwater runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
- Cleanup road grit and "track out" as soon as possible after storm events.

Protocols

- Snow will be plowed with belly plows attached to dump trucks and hauled using the dump trucks and backhoes if necessary.
- Salt spreaders attached to DPS dump trucks are used for salt application.
- Snow hauling is performed on major streets where accumulated snow stockpiles will significantly hinder the vehicular and pedestrian movement.
- Hauled snow should be stockpiled at Festival Park where any runoff first drains to a detention basin and the location is not near open water.
- Sensitive areas, such as public water supplies, lakes and ponds, should be identified and made known to salt applicators. Consider de-icing alternatives in sensitive areas.
- Ground-speed controllers should be used for all spreaders.
- Give salt time to work; time plowing operations to allow maximum melting by salt, before snow is plowed off the highway.
- When temperatures are below 0°F, beet juice can be used if necessary.
- Brine can be used as a pre-treatment to salt and if used, should be applied prior to the snow storm.
- Know when to plow and re-apply salt. The need for another salt application can be determined by watching melting snow kicked out behind vehicle tires. If the slush is soft and fans out like water, the salt is still working. Once the slush begins to stiffen and is thrown directly to the rear of vehicle tires, it is time to plow.
- For lesser traveled roads, consider applying salt in a windrow in a four to eight foot strip along the centerline of a two lane road. Less salt is wasted with this pattern and quickly gives vehicles clear pavement under at least two wheels. Traffic will soon move some salt off the centerline and the salt brine will move toward both shoulders for added melting across the entire road width.
- Determine levels of service for all roads in a service area. Salt application rates and frequency are based on traffic volume, road grade and curvature, intersections, and weather conditions. Sand or sand/salt mix should be used based on the level of service requirements.

- Rinsing or cleaning of the salt application trucks, and equipment should be done in indoor designated areas where the floor drains to the sanitary system.
- Calibration of spreaders should be done at the beginning of the winter season to the manufacture's recommendations.

Training

- Train drivers to improve loading of materials, application techniques and reduce losses.
- Train drivers to report areas of "over salting" to allow possible cleanup and to reduce salt runoff.
- Train staff to sweep up excess salt from loading / unloading areas that are exposed to weather.

MEASURABLE GOALS

- Quantities of salt and brine products used per year.
- Type of weather year encountered.
- # of salt applicators calibrated per year.

REFERENCES

GLRC Municipal BMP Handbook
www.mywatersheds.org

CITY OF NEW BALTIMORE

STORMWATER MANAGEMENT SYSTEM

APPENDIX C

EMERGENCY SPILL RESPONSE PLAN

STORMWATER POLLUTION PREVENTION &
SPILL RESPONSE PLAN
FOR
THE CITY OF NEW BALTIMORE

Plan Implementation Date: January, 2020
Revision Date(s): 5/13/2024

_____

Facility's Responsible Person(s) in charge of spill response planning, implementation, and maintenance of this plan:

Name	Phone #
JEFF STELLMAN, FIRE CHEIF	586-725-0990 OR 586-747-5910
JOHN KLIMASZEWSKI, DPS SUPERINTENDENT	586-725-9511 OR 586-894-2096

RESPONSIBILITIES

- The "**Facility Response Coordinator"** has primary responsibility for coordinating the response to emergencies, including chemical spills.
- **Superintendent/Foreman** should ensure that employees are familiar with these procedures and receive any necessary training.
- **All employees** should follow these procedures in the event of a chemical spill.

EMERGENCY CONTACT NUMBERS

The following telephone numbers should be posted near telephones and in other conspicuous locations:

- Outside emergency services (police, fire department, ambulance service): 911
- Nearest Hospitals with Emergency Services:
  Ascension St. John Hospital, 17700 23 Mile Rd., Macomb, MI 48044, 586-416-7500
  Beaumont Hospital Grosse Pointe, 468 Cadieux Rd., Grosse Pointe, MI 48230
  McLaren Macomb Hospital, Mount Clemens, MI 586-493-8000
- Nearest Urgent Care:
  Henry Ford Macomb Health Center Chesterfield, 30795 23 Mile Rd., Chesterfield, MI 48047, 586-421-3000
- Facility Response Coordinator: Tom Gunst
- Alt. Contact: Jeff Stellman
- Poison Control Center: 800-222-1222
- Regional EPA Office (Region 5): 312-353-2000
- MDEQ District Office: 586-753-3700
- OSHA area office: 517-487-4996
- National Response Center: 1-800-424-8802
- Macomb County Office of Emergency Management: 586-469-5270
- Macomb County Illicit Discharge Hotline: 877-679-4337
- St. Clair County Disaster Preparedness Team: 586-469-5270
- St. Clair County Dispatch (non-emergency):586-469-5151
- Others: _____

CLEAN-UP PROCEDURES

Spilled chemicals should be effectively and quickly contained and cleaned up. Employees should clean up spills themselves ***only if properly trained and protected.*** Employees who are not trained in spill cleanup procedures should report the spill to the Responsible Person(s) listed above, warn other employees, and leave the area.

In the event of spills greater than normal, contact the appropriate responders listed in the Emergency Contact Numbers listed above.

The following general guidelines should be followed for evacuation, spill control, notification of proper authorities, and general emergency procedures in the event of a chemical incident in which there is potential for a significant release of hazardous materials.

1. **Evacuation**
   Persons in the immediate vicinity of a spill should *immediately* evacuate the premises (except for employees with training in spill response in circumstances described below). If the spill is of "medium" or "large" size, or if the spill seems hazardous, immediately notify emergency response personnel.

2. **Spill Control Techniques**
   Once a spill has occurred, the employee needs to decide whether the spill is small enough to handle without outside assistance. Only employees with training in spill response should attempt to contain or clean up a spill.

   NOTE: If you are cleaning up a spill yourself, make sure you are aware of the hazards associated with the materials spilled, have adequate ventilation, and proper personal protective equipment. Treat all residual chemical and cleanup materials as hazard waste**.**

   Spill control equipment should be located wherever significant quantities of hazardous materials are received or stored. MSDSs, adsorbents, over-pack containers, container patch kits, spill dams, shovels, floor dry, acid/base neutralizers, and "caution-keep out" signs are common spill response items.

3. **Spill Response and Cleanup**
   Chemical spills are divided into three categories: Small, Medium and Large. Response and cleanup procedures vary depending on the size of the spill.

   Small Spills: Any spill where the major dimension is less than 18 inches in diameter. Small spills are generally handled by internal personnel and usually do not require an emergency response by police or fire department HAZMAT teams.

   - Quickly control the spill by stopping or securing the spill source. This could be as simple as up righting a container and using floor-dry or absorbent pads to soak up spilled material. Wear gloves and protective clothing, if necessary.
   - Put spill material and absorbents in secure containers if any are available
   - Consult with Facility Response Coordinator and the MSDS for spill and waste disposal procedures.

- In some instances, the area of the spill should **not** be washed with water. Use Dry Cleanup Methods and ***never*** wash spills down the drain, into a storm drain or onto the driveway or parking lot.
- Both the spilled material and the absorbent may be considered hazardous waste and must be disposed if in compliance with state and federal environmental regulations.

Medium Spills: Spills where the major dimension exceeds 18 inched, but less than 6 feet. Outside emergency response personnel (police and fire department HAZMAT teams) should usually be called for medium spills. Common sense, however, will dictate when it is necessary to call them.

- Immediately try to help contain the spill at its source by simple measures inly. This means quickly up righting a container, or putting a lid on a container, if possible. Do not use absorbents unless they are immediately available. Once you have made a quick attempt to contain the spill, or once you have quickly determined you cannot take any brief containment measures, leave the area and alert Emergency Responders at 911. Closing doors behind you while leaving helps contain fumes from spills. Give police accurate information as to the location, chemical, and estimated amount of spill.

- Evaluate the area outside the spill. Engines and electrical equipment near the spill area must be turned off. This eliminates various sources of ignition in the area. Advise Emergency Responders on how to turn off engines or electrical sources. Do not go back into the spill area once you have left. Help emergency responders by trying to determine how to shut off heating, air conditioning equipment, or air circulating equipment, if necessary.

- If emergency responders evacuate the spill area, follow their instructions in leaving the area.

- After emergency responders have contained the spill, be prepared to assist them with any other information that may be necessary, such as MSDSs and questions about the facility. Emergency responders or trained personnel with proper personal protective equipment will then clean up the spill residue. Do not re-enter the area until the responder in charge gives the all clear. Be prepared to assist these persons from outside the spill area with MSDSs, absorbents, and containers

- Reports must be filed with proper authorities. It is the responsibility of the spiller to inform both his/her supervisor and the emergency responders as to what caused the spill. The response for large spills is similar to the procedures for medium spills, except that the exposure danger is greater.

Large Spills: Any spill involving flammable liquid where the major dimension exceeds 6 feet in diameter; and ant "running" spill, where the source of the spill has not been contained or flow has not been stopped.

- Leave the area and notify Emergency Responders (911). Give the operator the spill location, name of chemical spilled, and approximate amount.

- From a safe area, attempt to get MSDS information for the spilled chemical for the emergency responders to use. Also, be prepared to advise responders as to any ignition sources, engines, electrical power, or air conditioning/ventilation systems that may need to be shut off. Advise responders of any absorbents, containers, or spill control equipment that may be available. This may need to be done from a remote area, because an evacuation that would place the spiller far from the scene may be needed. Use radio or phone to assist from a distance, if necessary.

- Only emergency response personnel, in accordance with their own established procedures, should handle spills greater than 6 feet in any dimension or that are continuous. Remember, once the emergency responders or HAZMAT team is on the job cleaning up spills or putting out fires, the area is under their control and no one may re-enter the area until the responder in charge gives the all clear.

- Provide information for reports to supervisors and responders, just as in medium spills.

REPORTING SPILLS

All chemical spills, regardless of size, should be reported as soon as possible to the Facility Response Coordinator. The Response Coordinator will determine whether the spill has the potential to affect the environment outside the facility and must be reported to Emergency Responders (911). **Examples of spills that could affect the outside environment include spills that are accompanied by fire or explosion and spills that could reach nearby water bodies.**

Accidental releases of certain toxic substances must be reported to the Michigan Office of Emergency Management: and the St. Clair County Disaster Preparedness Team, as required by the Emergency Planning and Community Right-to-Know Act. The Responsible Person will also make this determination.

LABEL SPILL KITS

- Label each spill kit prominently with the words “SPILL KIT” or “ABSORBENTS” etc.

- Label or stencil the necessary emergency telephone number(s) or pager number(s) of persons to be contacted in case of a spill or leak that is beyond the training and equipment available on or near each spill locker:

  Facility Response Coordinator/Phone Number: Tom Gunst/(586)-725-9511

  State 24-Hour Emergency Spill Reporting Hot-Line: 1 (877) 518-5608

- Stencil the following warning *PROMINENTLY* on each spill locker:

“WARNING: NEVER HOSE DOWN A SPILL!!
CLEAN IT UP PROMPTLY AND DISPOSE OF THE
WASTE PROPERLY."

SPILL KIT INVENTORY

List the spill response equipment that will be maintained in designated locker (refer to MSDSs to determine recommended clean-up methods and supplies)

Locker Location	Absorbants	Tools	PPE	Other Supplies
-	Floor Dry absorbant	Flat Shovel	Impervious Gloves	Warning Tape,
-	Rolls of sheets	Broom	Goggles, Aprons,	Warning labels
-	Containers of	Dust pan	Boots, Dust mask,	
-	neutralizing agent	Waste container		
-		Squeegee		

PERSON RESPONSIBLE FOR MAINTAINING THIS INVENTORY: Joe Vernier