

MUNICIPAL FIELD GUIDE

FIRST EDITION JULY 2008

Revised November 2015



INTRODUCTION

What is Storm Water Runoff?

Storm water runoff occurs when rain flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent storm water from naturally soaking into the ground.

Why is Storm Water Runoff a Problem?

Storm water can pick up debris, chemicals, dirt, and other pollutants and flow into a storm drain system or directly to a stream or the ocean. Anything that enters a storm drain system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The Effects of Pollution

Polluted storm water runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris – plastic bags, six-pack rings, bottles, and cigarette butts – washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life.
- Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted storm water often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Reference: EPA 833-B-03-002, January 2003



This document is a field manual on storm water Best Management Practices (BMPs) for implementation by municipal maintenance staff.

This document is divided into four sections which are grouped by related activities. Task specific BMPs have been provided; these BMPs are accompanied by general BMPs applicable to each section.

The management of storm water during field activities contributes to overall water quality. By implementing BMPs we can prevent, reduce and eliminate water pollution.

The Revised Ordinances of Honolulu, Section 14-12.23(a), Environmental Quality Control-Violation states:

“It shall be unlawful for any person to discharge or cause to be discharged any pollutant into any drainage facility which causes a pollution problem in state waters, or causes a violation of any provision of the city NPDES (National Pollutant Discharge Elimination System) permit or the water quality standards of the State of Hawaii.”

Know the laws and implement storm water BMPs during your daily tasks to prevent pollutants from entering the storm drain system and polluting our waters.

ACKNOWLEDGEMENTS

This document was derived from the California Storm Water Quality Association (CASQA) "Best Management Practices Manual for Municipal Operations".

Acknowledgement is given to the CASQA, Storm Water Best Management Practice Handbook-Municipal, for the use of the text in this document. The text has been significantly modified for brevity.



▲ Contain the spill, use absorbents for clean up of liquids



▲ Adjust sprinkler heads to reduce runoff

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ROAD, STREET, PARKING LOT & SIDEWALK MAINTENANCE

Streets, roads, parking lots and sidewalks can contribute to storm water pollution if they are not maintained properly. The procedures below will help reduce the pollutants in storm water.

Patching, Resurfacing & Surface Sealing

- Schedule work during dry weather
- Transfer or load hot bituminous material away from drainage systems or water courses
- Before cold planing or resurfacing, cover and seal nearby storm drain catch basins and inlets to prevent excess material from entering the storm drain system
- Clean area of loose asphalt and any debris before leaving site

Pavement Marking

- Transfer & load paint and hot thermoplastic away from storm drain inlets
- Place drop cloths in mixing areas
- Consider using water-based paints when appropriate

Sidewalk, Gutter & Curb Repair

- Shovel or vacuum slurry from the site
- Keep cement powder covered and away from streets, gutters, storm drains, rainfall and runoff
- Return leftover material to the mixer
- Wash concrete trucks off site or in an area designated to preclude discharge of wash water to a drain system



▲ Provide drip pans/material under idle equipment

Pollution Prevention

- Protect storm drain inlets and adjacent water bodies prior to beginning work
- Do not wash any material into the street or storm drain system
- Schedule repair, resurfacing, or patching work for dry weather; in the event of unexpected rain, divert runoff around work areas

Material Storage

- Store maintenance/construction materials under cover, away from drainage facilities and lowlying areas
- Secure bags of cement after they are open
- Locate stockpiles away from streets, gutters, storm drain inlets, water courses and rights-of-way

Waste Disposal

- Recycle/Reuse whenever possible
- Remove/Dispose of wastes as work progresses
- Dispose of waste material appropriately

Spill Response & Prevention

- Contain the spill immediately
- Use rags or absorbents for clean up of liquids
- Use brooms or shovels for clean up of dry materials
- Dispose of waste material properly
- Report spills to supervisor immediately
- Notify Department of Emergency Management (808) 723-8960
- If spill impacts environment or public safety, report spill to 911



▲ Protect storm drain inlets and adjacent water bodies prior to beginning work

ROAD, STREET, PARKING LOT & SIDEWALK CLEANING

Littering and vehicle use are potential sources of pollutants. The following practices will reduce the amount of pollutants in storm water.

Street Sweeping

- Maintain a consistent sweeping schedule
- Operate sweepers at manufacturer's requested optimal speed
- Keep accurate logs
- Record curb miles swept
- Record amount of waste collected

Power Washing

- Install storm water socks at drain catch basins and inlets
- Direct runoff into a landscaped or unpaved area if wash water does not contain chemicals
- If cleaning agents are used seal downstream storm drains and vacuum/pump wash water to the sanitary sewer system if allowed, or dispose as hazardous waste, as appropriate

Graffiti Removal/Paint Over

- Transport paint and materials to and from job site in containers with secure lids and tied down to the transport vehicle
- Do not transfer or load paint near storm drain inlets or water courses
- Test and inspect spray equipment prior to use
- Do not overfill paint container
- Dispose of unused paint appropriately, see opala.org



▲ Use rags, absorbents for clean up of liquids

◀ Avoid wet cleaning or flushing of street, and utilize dry methods where possible

Pollution Prevention

- Use dry cleaning methods
- Use the least toxic materials available
- Use water-based paints, gels or sprays
- Sweep regularly
- Cover trash receptacles

Waste Disposal

- Do not store swept material along the side of the street or near a storm drain inlet
- Collect sweeping and dispose of in the trash
- Dispose of waste material at a properly permitted landfill

Illicit Discharge Prevention

- Use dry cleaning methods where possible
- Do not wash any material into the street or storm drain system
- Protect storm drain inlets and adjacent water bodies prior to beginning work
- Clean inlet and remove plugs (barriers) when job is complete

Spill Response & Prevention

- Respond to all spills immediately
- Contain the spill
- Use rags, absorbents for clean up of liquids
- Use brooms or shovels for clean up of dry materials
- Dispose waste material properly
- Report spills to supervisor immediately
- Notify Department of Emergency Management (808) 723-8960
- If spill impacts environment or public safety, report spill to 911



▲ Protect inlets from non storm water runoff

LANDSCAPE MAINTENANCE

The objective of this section is to minimize the discharge of pesticides, herbicides, fertilizers, clippings and cuttings to the storm drain system and receiving waters.

Pesticide & Herbicide Application

- Be familiar with material safety data sheets (MSDS)
- Follow the label, it is the law
- Use for spot treatment
- Apply on an as needed basis, not on a preventative schedule
- Use mulch or other groundcover to suppress weeds
- Do not use if rain is expected
- Do not apply during high winds
- Do not mix or prepare near storm drains
- Prepare the minimum amount needed
- Triple rinse containers, and use rinse water as product

Fertilizer Application

- Do not dump onto the surface
- Work fertilizer into the soil for new plantings

Leaf Blowers

- Gather debris in mounds away from storm drains
- Do not blow mounds from one location to another
- Place debris in trash bags, seal immediately
- Locate trash in central area for collection
- Do not blow bare ground

Grass Cutting

- Use mulch when soils are exposed
- Do not mow before heavy rains
- Collect waste and compost or dispose of at landfill

Irrigation

- Minimize runoff from the landscape area(s)
- Irrigate slowly or pulse irrigate to prevent runoff, irrigate only as much as is needed
- Water in the morning or evening as much as possible
- Repair leaks in irrigation systems immediately

Pollution Prevention

- Choose flowers, trees, shrubs and groundcover that require minimal amounts of water
- Properly time fertilizing, weeding, pest control and pruning
- Minimize excessive watering and repair leaky irrigation systems

Waste Disposal

- Compost vegetation or dispose of at a permitted landfill
- Dispose of empty pesticide, herbicide and fertilizer containers according to the instructions on the container label

Illicit Discharge Prevention

- Do not wash any material into the street or storm drain system
- Place stockpiles away from storm drain inlets and water courses
- Protect storm drain inlets and adjacent water bodies prior to beginning work
- Remove plugs (barriers) when job is complete

Spill Response & Prevention

- Inspect pesticide/fertilizer equipment and transportation vehicles daily
- Respond to all spills immediately
- Contain the spill
- Use rags or absorbents for clean up of liquid
- Use brooms or shovels for clean up of dry material
- Dispose of waste material properly
- Report spills to supervisor immediately
- Notify Department of Emergency Management (808) 723-8960
- If spill impacts environment or public safety, report spill to 911



▲ Follow labels when using lawn care chemicals (the label is the law!)

VEHICLE & EQUIPMENT MAINTENANCE

Spills and leaks that occur during vehicle and equipment operation and maintenance can contribute pollutants to storm water runoff. Implementing the following management practices will reduce the potential for pollutant discharge.

Fueling

- Fuel at designated fueling area
- Locate pump emergency shutoff
- Place drip pans or absorbent pads under leaking vehicle/equipment
- Do not leave vehicle/equipment unattended while fueling
- Do not top off fuel tanks
- Check for leaks or spills during pumping of liquids; repair leaks immediately

Repair

- Perform maintenance activities indoors or under covered work area
- Perform all liquid cleaning at a centralized station
- Do not pour materials down drains or hose down work areas, dispose according to applicable laws and regulations
- Store used batteries in a non-leaking covered secondary containment and recycle or dispose of at a hazardous waste facility
- Minimize use of solvents

Cleaning

- Keep the area clean, sweep up trash and wipe up spills with rags or absorbent material immediately
- Oil changes and other engine maintenance cannot be conducted in the wash area
- Discharge vehicle wash water to an oil-water separator connected to the sanitary sewer, not to the storm drain



▲ Do all liquid cleaning at a centralized station

Material Storage

- Clearly tag or label all containers
- Keep an accurate, up-to-date MSDS
- Store equipment under cover

Waste Disposal

- Transfer waste fluids to a labeled waste storage container
- Recycle/Reuse materials when possible
- Manage used rags through a rag service or as hazardous waste
- Do not dispose of leftover or used cleaning solutions, solvents or automotive fluids into the sanitary sewer

Illicit Discharge Prevention

- If temporary work is conducted outside use a tarp or drip pans to capture all spills and dispose of the fluids properly
- Protect storm drain inlets and adjacent water bodies prior to beginning work

Spill Response & Prevention

- “Spot Clean” leaks and drips routinely
- Respond to all spills immediately
- Contain the spill
- Use rags or absorbents for clean up of liquids
- Use brooms or shovels for clean up of dry materials
- Dispose of waste material properly
- Report spills to supervisor immediately
- Notify Department of Emergency Management (808) 723-8960
- If spill impacts environment or public safety, report spill to 911



▲ Provide spill kits next to fueling and maintenance areas

▶ Dispose of waste material appropriately



DRAINAGE SYSTEM & UTILITY MAINTENANCE

Storm water system collects and transports urban runoff that may contain pollutants. Maintaining catch basins, storm water inlets and other structures will remove pollutants, prevent clogging and restore the systems sediment trapping capability.

Boulder/Retention Basin Cleaning

- Clear and remove (overgrowth, debris, rocks and silt)
- Check basins monthly and clean as required

Catch Basin

- Clean drainage structures before the wet season
- Clean out the drain structure before it is 40% full
- Inspect drain line and structures regularly and more often during the rainy season
- Use required equipment for confined space entry
- Perform daily check on assigned truck and attachments, make any repairs
- Dispose of removed/collected wastes at designated disposal site
- Keep accurate logs of number of catch basins cleaned
- Record the amount of waste collected/removed

Stream, Ditch & Flood Channel Cleaning

- Inspect stream, ditch and flood channel regularly and after large storm events
- Clear and remove overgrowth, debris, rocks and silt
- Do not stockpile material in stream, ditch, flood channel or other waterways

Drainage System Repair

- See Road, Street, Parking Lot and Sidewalk Operation and Maintenance pg. 4 & 5



▲ Regulate and control pressure of water jetting and vacuum apparatus

◀ Stencil storm drains

Documentation

- Log amount of debris removed
- Use appropriate equipment and procedures for confined space entry
- Document if no cleaning required
- Complete foreman's report, drainage reports and Confined Space Entry Permit

Waste Disposal Prevention

- Transfer waste fluids to appropriate disposal site
- Do not discharge to the storm drain system
- Dispose of material at landfill

Illicit Discharge & Illegal Dumping Prevention

- Record locations of apparent illegal discharges/illicit connections
- Notify supervisor immediately
- Stop the discharge as quickly as possible
- Note evidence of spills such as paints, discoloring, etc.
- Note any odors associated with the drainage system
- Track flow back to potential dischargers and conduct above ground inspection

Spill Response & Prevention

- Contain the spill immediately
- Use rags or absorbents for clean up of liquids
- Use brooms or shovels for clean up of dry materials
- Dispose of waste material properly
- Report spills to supervisor immediately
- Notify Department of Emergency Management (808) 723-8960
- If spill impacts environment or public safety, report spill to 911



▲ Spot treat, use only as needed

USEFUL CHECKLISTS

Catch Basin Cleaning Checklist

Crew # _____ Date: _____

Location: _____ Structure ID: _____

Condition of CB:

Empty ¼ Full ½ Full ¾ Full Full

Type of Cleaning: Manual Vactor

Volume of Debris: _____ cubic feet

Disposal Site: _____ Total Tons: _____ Dumping Fee: \$_____

Erosional Area Inspection Checklist

Location: _____ Date: _____

Inspector: _____

Type of Inspection:

Monthly After Heavy Rain Event Compliant

Type of Erosion Observed:

Sheet Rill Gully Channel Slide/Rock Fall

Area: _____ Length: _____ Height: _____

Description of Erosion: _____

Existing Vegetative Cover: Yes No

Describe type of vegetation and percent coverage:

Existing Erosion Controls: Yes No

If Yes, provide location and description

Sediment Observed Downstream of Erosional Area: Yes No

If Yes, describe location, flow patterns, estimated volume of sediment

Public or Traffic Safety Concerns: Yes No

If Yes, describe in detail

Litter Receptacle Pickup Checklist

Operator Name: _____ Date: _____

Day of Week: M T W TH F Sa Su

Route Name: _____ Truck ID: _____

Number of Stops: _____

Number of Containers Serviced: _____

Est. Number of Full Bags: _____

Disposal Site: _____

Total Tons: _____ Dumping Fee: \$ _____

Daily Sweeping Operations Checklist

Operator Name: _____ Sweeper ID: _____

Route Name: _____ Date: _____

of Streets: _____

Curb Miles Swept: _____

Number of Hopper Load(s) ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or full): _____

Boulder Basin/Detention Basin Inspection Checklist

Basin Name: _____ Channel Name: _____

Inspector: _____ Date: _____

Type of Inspection

Monthly After Heavy Rain Event Compliant

Amount of Sediment Observed

Empty $\frac{1}{4}$ Full $\frac{1}{2}$ Full $\frac{3}{4}$ Full Full

Description of Sediment (sediment, rock, vegetation, trash, etc)

Outlet Structure Clear: Yes No

If No, provide description of obstructions

Upstream and Downstream Clear: Yes No

If No, provide description of obstructions

Erosion Observed: Yes No

If Yes, provide location and description

Structural Integrity Intact: Yes No

If Yes, provide description (damaged concrete, outlet structure, berm, etc)

USEFUL TELEPHONE NUMBERS

City & County of Honolulu

- Environmental Concern Line..... 768-3300
Department of Emergency Management..... 732-8960
Department of Planning and Permitting (DPP)
Grading, Stockpiling, Grubbing, Trenching Permits..... 768-8219
Erosion Control, Grading Plan Review/Approval Process..... 768-8108
Storm Drain Connection Licenses..... 768-8106
*Effluent Discharge Permit to City Storm Drains—
Construction Dewatering*..... 768-8106

Department of Facility Maintenance (DFM)

- Effluent Discharges Permit to City Storm Drains—Hydrotesting,
Well Drilling, Other Activities (Storm Water Quality Br.)* ... 768-3243

Department of Environmental Services (ENV)

- Industrial Discharges to Sanitary Sewer System
(Regulatory Control Br.)*..... 768-3286
Refuse & Recycling (Solid Waste Br.)..... 768-3200

Hawaii State Department of Health

- NPDES Effluent Discharge Permit (Clean Water Br.)*..... 586-4309
*Construction & Demolition Waste, Pollution Prevention & Waste
Minimization Program (Solid & Hazardous Waste Br.)*..... 586-4226
Hazard Evaluation & Emergency Response Ofc...... 586-4249
After Hours..... 247-2191

Hawaii State Department of Land & Natural Resources

- Stream Protection & Management Br., Commission
on Water Resource Management Div.*..... 587-0234
Stream Channel Alteration Permit (CWRM Regulation Br.).. 587-0225
Dam Safety Program (Engineering Div.)..... 587-0230

Federal Agencies

- US Department of Agriculture—National Resources
Conservation Services Pacific Islands Area State Ofc.*..... 541-2600
*US Army corps of Engineers—
Honolulu regulatory Br. (Permits)*..... 438-925
*US Coast Guard—National Response Center
(oil spills or hazardous materials releases)*..... (808) 424-8802
*US Environmental Protection Agency,
Pacific Islands Contact Ofc.*..... 541-2710

**Call “911” to report a situation that may impact public safety or
an environmental emergency that requires immediate assistance.**