Attachment B. Site Design Strategies and Residential Source Control BMPs

DO NOT SUBMIT. Include with the Owner’s Copy.

Refer to the below general guidance information on storm water management BMPs for residents. More information on activities residents can do to reduce storm water pollution are available at the Department of Facility Maintenance- Storm Water Quality Branch Website: http://www.honolulu.gov/dfmswq/learningctr.html

Site Design Strategies
The following general guidance corresponds to Section i of the RSWMP.

Landscaped Areas
- Minimize disturbance to existing natural areas, soils, and landscape areas.
- Limit runoff from landscaped areas to hardscape areas.
- Direct runoff from roof(s) and hardscape areas to landscaped areas.
- Select native plants for landscaped areas.
- Protect slopes and channels.

Storm Drain Inlets
- All storm drain inlets and catch basins, constructed or modified, within the Project area should be labeled with prohibitive language.
- Do not place signage on the face of curbs where they may be damaged by vehicle traffic.

Automatic Irrigation
- Design irrigation systems for each landscape area’s specific water requirements and to minimize runoff of excess irrigation water.

Downspout Disconnect
- Downspouts should be disconnected from an underground connection and directed towards an adjacent vegetated area, planter box, or rain barrel instead. Caps are installed on the portion of the underground system (standpipe) that remains aboveground.

Downspout Outlet Protection
- Install splash blocks, rock dissipaters, flexible/retractable extensions, or other outlet protection device(s) at the downspout outlet(s) to minimize erosion and/or help direct water farther from the house.

Permeable Hardscape
- Use turf blocks, porous pavers, or porous pavements for patios, walkways, driveways, and/or overflow parking.
- Direct runoff from roof(s) and hardscape areas to permeable hardscape areas.

Rain Garden
- Direct runoff from rooftops, sidewalks, and driveways to a rain garden.
- Select native plants for rain gardens.

Planter Box
- Direct runoff from rooftops to planter box.
- Select native plants for planter boxes.

**Minimize Soil Compaction**
- Minimize disturbance to existing natural areas, soils, and landscape areas.
- Prevent heavy equipment from driving over areas where permeable hardscape or rain gardens will be installed.

**Residential Source Control BMPs**
The following general guidance corresponds to Section ii of the RSWMP.

**Gardening**
- Minimize disturbance to existing natural areas, soils, and landscaped areas.
- Sweep or use a mulching leaf vacuum to collect leaves, clippings and other yard wastes.
- Mow grass high and leave clippings on lawn as a natural fertilizer.
- Plant native plants to reduce fertilizer and herbicide uses.

**Pesticides, Herbicides and Fertilizers**
- Use pesticides, herbicides and fertilizers sparingly and switch to non-toxic products.
- Avoid applying near driveways or gutters.
- Never apply before or during a rain event or in high winds.
- Store fertilizers, pesticides, and other toxic garden chemicals in a covered area and in sealed, waterproof containers.

**Residential Car Washing**
- Take vehicles to commercial carwash to clean.
- Wash vehicles on grass, gravel or other pervious surfaces.
- Use phosphorous-free soap, and a bucket, sponge, and nozzle on the end of the hose to minimize water runoff to storm drain when vehicle is washed on a driveway or street. Dispose of water in bucket into toilet or sink.

**Residential Car Maintenance**
- Take vehicles to a shop for maintenance.
- Perform maintenance away from storm drains.
- Have old rags or other absorbent material readily available to clean up a spill.
- Use an “oil change box” if changing your own oil.
- Recycle your waste oil and antifreeze/coolant. Return batteries to the place of purchase.

**Swimming Pool Management**
- Discharging pool water to a storm drain requires an effluent discharge permit from DFM- Storm Water Quality Branch or the Department of Transportation.
- Dechlorinate swimming pool prior to discharging.
- Discharge using a pump and hose directly into storm drain inlet or catch basin.

**Trash Management**
- Bag and tie trash securely before placing in trash container.
- Cover trash containers with roofs, awnings, or attached lids.
- Trash storage area should not drain to storm drain inlet.
GREEN INFRASTRUCTURE FOR HOMEOWNERS
Green Infrastructure for Homeowners

Provided by the City and County of Honolulu, Department of Facility Maintenance

Statement of Purpose
This manual has been developed for educational purposes by the City and County of Honolulu. The stormwater runoff improvement practices included in this guide are meant to be used as general guidelines and are not to be used as professional engineering specifications. Prior to implementation of ANY practices, seek technical assistance from a licensed professional engineer, landscape architect, or certified professionals in erosion and sediment control for specification for these practices.

Printed January 2012

http://www.cleanwaterhonolulu.com
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Glossary of Terms

**Best Management Practice (BMP)** - refers to methods or techniques found to be most effective and practical for a particular situation.

**Downspout** – pipe that directs stormwater runoff from the roof of a house to the ground.

**Green Infrastructure** – a design element for a property that uses landscaped systems or manmade engineered systems and mimic natural systems.

**Hydrology** – the way water moves over the land and through the ground.

**Infiltration** – the process by which water is soaked into the soil.

**Impervious (non-permeable) surface** – does not allow water to be absorbed into or through the surface.

**Low Impact Development (LID)** – a stormwater management and land development strategy used at the lot and subdivision scale that uses thoughtful land use planning and on-site natural features with small-scale stormwater controls to try to match the way the stormwater traveled over and through the landscaping before development.

**Permeable (or pervious)** – allows water to be absorbed into or through the surface.

**Rain Barrel** – a catchment system that collects runoff from a roof for reuse.

**Rain Garden** – a planted depression that allows rainwater runoff from impervious urban areas like roofs, driveways, walkways and compacted lawn areas to be absorbed into the earth.

**Stormwater runoff (or runoff)** – rainwater that does not soak into the ground but flows over impervious areas or areas already saturated with water.
**Introduction to Green Infrastructure**

Urban development has changed the natural landscape of our environment, our native forests, farm lands, and waterways. Green natural areas have been replaced with rooftops, paved roads, and other hard surfaces. Such land use changes in Hawai‘i and elsewhere increase the amount of stormwater flowing to streams and beaches because less rainfall soaks into, or infiltrates, the ground (see Figure 1). More frequent contact with hard surfaces causes stormwater to flow more quickly. Stormwater also picks up pollutants such as trash, dirt, road grime, oil, pesticides, fertilizers, and hard metals and deposits them into our streams, onto our beaches, and into the ocean, degrading the quality of our natural water resources.

![Diagram showing infiltration and evapotranspiration]  
*Figure 1: Urban development increases stormwater runoff because less water seeps into the ground.*

Green infrastructure is a design element for a property that uses natural systems or uses manmade engineered systems that mimic natural systems which promote infiltration and treatment of pollutants. The amount of stormwater and pollutants released into our streams, beaches, and oceans is minimized when stormwater is retained and treated using green infrastructure on your property.

Mimicking the natural rainwater cycle by capturing rainfall from driveways and rooftops, green infrastructure reintroduces this cycle back to a developed area by providing an outlet where runoff can be absorbed into the soil, evaporated into the air, or stored in a container for later use to irrigate plants. Some pollutants, such as dirt, oil, and hard metals, are filtered out as stormwater soaks into the ground and other organic pollutants, such as phosphorous and nitrogen, are absorbed by plants to help them grow. Some of the major benefits of green infrastructure include:

- Less stormwater leaves the property
- Stormwater can be captured, stored and reused for irrigation
- More water is absorbed into the ground to recharge our drinking water from underground wells
- Less pollutants go to our streams and beaches and the ocean
- Habitat is improved for aquatic animals like fish and coral
**Introduction for Homeowners**

Rainfall is a precious natural resource that nourishes plants and replenishes artesian wells, our primary source of underground potable water here in Hawai‘i. When it rains hard enough that the ground cannot absorb all the rainwater, the rainwater begins to flow along the ground surface. This flow of water is referred to as stormwater runoff (sometimes simply referred to as runoff).

This handbook discusses the effects of pollutants and stormwater runoff on our environment, explores why urban runoff should matter to homeowners, proposes green infrastructure solutions for homeowners to manage stormwater, and outlines steps for homeowners to get started.

**Pollutants and Stormwater Runoff**

As stormwater leaves your property, it picks up trash, oil, pesticides, and other pollutants and carries them to street gutters and storm drains, which empty into our streams and coastal waters. Pollutants introduced into our bodies of water have harmful effects that can be detrimental to both health and habitat. Common sources of pollutants include cars leaking oil, construction activity, car washing, sewer spills, leaf litter, and grass clippings.

Table 1 – Common Stormwater Pollutants lists pollutants, their effects, and common sources.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Effect</th>
<th>Common Source</th>
</tr>
</thead>
</table>
| **Total Suspended Solids (TSS):** Very small solid particles such as dirt; weathered rock fragments; plant, insect and animal decay; minerals; and sediments. | High concentrations can create large plumes of murky water in the ocean that reduce the amount of sunlight for aquatic plants and suffocate fish, coral, and other organisms. | - Land surface erosion
- Pavement and vehicle wear
- Building and construction sites
- Illegal discharges
- Organic matter (e.g., leaf litter) |
| **Nutrients:** Small amounts are necessary to sustain life. For water quality, the main nutrients of concern are potassium and phosphorus. | An increase of nutrients in water stimulates the growth of aquatic plants and algae. Too much can cause excessive growth and algal blooms, which can deprive fish and aquatic habitants of oxygen. | - Organic matter
- Fertilizer
- Sewer overflows, cesspools
- Animal feces
- Detergents (car washing)
- Illegal discharges |
| **Micro-organisms:** Bacteria and pathogens which are not visible to the naked eye. | Hazardous bacterial and viral pathogens in water can cause illnesses in humans if ingested or if they come in contact with an open wound. | - Animal feces
- Sewer overflows, cesspools
- Organic matter decay
- Illegal discharges |
| **Heavy Metals:** Individual metals and metal compounds that in large amounts can be toxic. These metals include copper, cobalt, lead, chromium, and mercury. | Heavy metals tend to build up within living organisms when ingested causing cell damage and illness. Metals tend to persist in the environment and are not biodegradable. | - Atmospheric deposits
- Vehicle wear
- Weathering of buildings
- Sewer overflows, cesspools
- Illegal discharges |
Table 1 Common Stormwater Pollutants (continued)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Effect</th>
<th>Common Source</th>
</tr>
</thead>
</table>
| **Gross Pollutants**: Litter, trash, and debris. | Animals, especially aquatic life, can ingest these pollutants, choke on foreign objects, become ensnared in debris, and fall ill due to hazardous waste. | - Pedestrians and vehicles  
- Waste collection systems  
- Leaf-fall from trees  
- Lawn clippings  
- Spills and accidents |
| **Surfactants**: Soaps, shampoo, detergents, and oils. | Can be toxic to fish and other aquatic life. | - Asphalt pavements  
- Illegal discharges, sewer spills  
- Leaks from vehicles  
- Car washing  
- Organic matter |

Example Effects of Stormwater Pollution

Cloudy, discolored water from erosion and sediment  
Oil sheen on water surface  
Trash and sediment in a drainage channel
How Does Urban Runoff Affect Me?

During the initial phase of rainfall, loose trash and debris, such as oil from cars, plastic bags, leaves, cigarette butts, and soft drink cups, are carried off by stormwater runoff. Yards can also contribute loose dirt and nutrient pollutants, such as nitrogen and phosphorous. When these pollutants reach our streams and ocean they increase the occurrence of algal blooms (from nutrients), which rob the water body of oxygen; sediment clouds (from loose dirt), which restrict the amount of sunlight to aquatic plants and corals that require it; and fish deaths from toxic chemicals. Stormwater runoff further contributes to flooding and stream bank erosion, and can overload municipal drainage systems.

What Can I Do about Urban Runoff?

Every property owner can evaluate how water collects on and leaves their property and determine whether employing green infrastructure is appropriate and feasible. The amount of water your yard can absorb depends on a number of things, including the type of soil, slopes, and available space.

Reducing Runoff

The goals of green infrastructure are to restore the natural water cycle for a property or community and improve the water quality of runoff leaving the property or community. The approaches of green infrastructure use techniques for reducing the amount of hard surfaces on a property, increasing the amount of lawn and garden areas, and redirecting stormwater runoff to low lying vegetated areas. Runoff can soak into the ground in these areas and undergo filtration by plants. Runoff can also be collected and stored in a manmade container for later use.

Some green infrastructure practices, like rain gardens and vegetated swales, collect stormwater runoff and allow the rainwater to soak into the ground; others, like rain barrels, store it for later use. Simply redirecting stormwater runoff from roofs and paved areas to vegetated areas reduces the amount of runoff and can significantly reduce pollutants from light rainfall events.

Removing Pollutants

Plants and soil in lawns and gardens are also effective in removing pollutants from stormwater through a process called bio-filtration. In this process, the soil traps and plant roots breakdown pollutants into food or fertilizer. Some of the pollutants that can be trapped or removed by the soil and plants include:

- Suspended Solids (dirt)
- Nutrients (nitrogen and phosphorous)
- Gross Pollutants (trash)
- Heavy Metals (lead, copper, and zinc)
- Micro-Organisms (bacteria)
- Surfactants (detergents, oils, and grease)
How Do I Get Started?

The following process will show you how to evaluate your property and select the appropriate green infrastructure and its location. First, you will assess your property to identify pollutant sources, identify and/or verify existing water flow drainage (and runoff) patterns, and determine the best location(s) and most suitable type(s) of green infrastructure for your particular property. Next, you will evaluate practical limitations and cost considerations.

We attempted to present the green infrastructure in a manner that would allow you to perform the installation yourself; however, as every individual has different abilities, resources, and experience, you may feel the need to hire professionals to perform the selection, design, and/or installation. Also, depending on building codes, size, or complexity, some installations may require the services of a licensed professional engineer and the installation and maintenance services of a licensed contractor.

The following steps are provided for the property assessment process:

1. Sketch your property
2. Locate sources of storm water runoff and pollutants
3. Determine how water drains/where it goes
4. Identify possible locations for green infrastructure
5. Recognize limitations (space limitations, poorly draining soils, steep slopes, and existing structures)
6. Select green infrastructure

Sketch Your Property and Locate Potential Sources of Pollutants

Step 1: Begin with a sketch showing a general outline of the property, structures (e.g., house, garage and deck), and other hard surfaces (e.g., driveway, patio and pavements) similar to Figure 2.

Step 2: Locate points where stormwater is concentrated, such as downspouts and pipes through curbs or walls, and where it runs off hard surfaces.

Step 3: Identify areas where pollutants can be exposed to rainwater, such as bare ground cover, oil stains, and dirt piles.

Figure 2: Property sketch with potential sources of pollutants
As a more elaborate example, Figure 3 shows a rendering of a house lot and several pollutant sources.

Figure 3: Site map with potential sources of pollutants

The potential pollutant sources shown in the figure are as follows:
1. Roof downspouts
2. Drain connections to the curb (downspout with buried pipe)
3. Paved and other hard surfaces (driveways, concrete slabs)
4. Bare areas with little or no vegetation
5. Oil stains from car leaks
6. Dirt piles
7. Leaf litter not picked up or mulched
8. Trash and debris

Potential Pollutant #2 – Drain connection to curb
Potential Pollutant #5 – Oil stains in the driveway
**Determine Where the Water Goes**

Determine the direction stormwater flows off your property and mark it on the sketch. The stormwater will flow from the high points, such as the peak of the roof, to the low points, such as down the gutter downspout or the driveway apron. You may also want to observe the stormwater runoff pattern on your property during a rain event, or watch the way water flows when you water the lawn. Identify any depressions (e.g., low lying areas, potholes, sinkholes) that may collect rainwater or alter its flow off of your property. Figure 4 shows typical flow patterns on the house lot rendering.

![Figure 4: Arrows showing water flow direction during a rain event](image)

Identify any low lying areas on your property. Locate downspouts and where runoff is directed.
Select and Locate Green Infrastructure

Generally, green infrastructure should be placed in areas where water collects, or in areas where water will flow prior to leaving your property. Splash blocks can be placed at downspouts to slow stormwater runoff or downspouts can direct runoff into rain barrels that collect rainwater from your rooftop. Consider landscaping areas that are not vegetated to control sediment runoff. Use the Fact Sheets at the end of this chapter to get information on the various types of green infrastructure that you can use for your home.

Figure 5 shows how and where we selected green infrastructure for our example house lot. Notice that we removed leaves, trash, and debris from our property. Even if you do not install any green infrastructure, keeping loose clippings, leaves, and trash out of the storm drain system helps prevent stormwater pollution.

1. We covered bare dirt areas with grass.
2. We installed rain gardens to slow down and capture runoff in areas where flowing water converges or where water flows before leaving the property.
3. We installed a rain barrel to capture and store water from the gutters/downspout.
4. We extended the downspout to drain directly into our rain garden.
5. We installed a rain barrel to reduce some of the runoff volume in the corner of the property. The runoff coupled with the steep slope created the dirt pile we saw earlier.
6. We removed the concrete pavement next to the garage and replaced it with grass, thereby creating more surface area for water to be absorbed into the soil.
7. We replaced the concrete driveway with turf blocks (permeable pavement) which slowed down runoff and allowed the grass between the blocks to utilize their natural ability to break down the oil that used to stain the concrete driveway using biofiltration.

Figure 5: Locations for potential green infrastructure practices
Limitations to Consider

During your property assessment, consider limitations that affect the types of green infrastructure you can install. These limitations include:

- **Space**: Consider to the space between the green infrastructure you want to install and physical features of your property, such as your house or your neighbor’s property. It is a good idea to keep areas that collect and contain stormwater runoff away from both your house and your neighbor’s property. Low areas that pond can increase the chance of flooding and, if the drainage is poor, may cause structural damage to your house.

- **Steep slopes**: The steeper the slope, the faster water travels. If slopes are too steep, the water will not have enough time to soak into the ground. Steep slopes may not be appropriate for some types of green infrastructure.

- **Existing structures**: Not all types of green infrastructure can easily be adapted to existing structures.

- **Poorly draining soil**: Poorly draining soils limit the amount of stormwater a site can handle, so certain types of green infrastructure may not be effective or appropriate. There are four major types of soils: gravel, sand, silt, and clay. Gravel and sand allow runoff to infiltrate quickly, as can be seen by how fast water drains at a beach. Alternatively, silt and clay drain much more slowly.

**Exercise: See how fast your soil drains - dig a hole, pour water and watch it drain**

This test, which is based on the City of Portland Environmental Services Site Assessment Guide, measures the soil infiltration rate at the location you plan to use for your rain garden or other green infrastructure. You will be digging a hole, filling it with water and finding out how long it takes for the water to soak into the ground.

You will need a shovel, water, a timer, and something to write with and write on.

**Directions:**
1. Dig a minimum 6-inch diameter hole at least 12-inches deep at your proposed location for the rain garden or green infrastructure that will need to have rainwater soak into the ground.
2. Fill the hole with water from a bucket or hose, record the time, and see how long it takes to drain completely.
3. Fill the hole with water again and start keeping time.
4. If the water on the second fill does not drop at least two inches in one hour, your soils may not drain well enough without modifying or replacing some soil.
Green Infrastructure Fact Sheets for Homeowners

Several helpful fact sheets are available to assist the homeowner in going green. The first fact sheet provides general information on sustainable practices. It also introduces the concept of low impact development (LID) and how it can be applied to an existing house lot. The remaining fact sheets are how-to guides for specific green infrastructure practices. These how-to guides include the benefits to the environment and homeowner, and specific considerations for implementation. They also offer a rating for ease of implementing and maintaining the green infrastructure as well as its relative cost. The available fact sheets are as follows:

Fact Sheet #1: Sustainable Practices for Homeowners
Fact Sheet #2: Downspout Disconnection
Fact Sheet #3: Downspout Outlet Protection
Fact Sheet #4: Ground Covers
Fact Sheet #5: Permeable Hardscape
Fact Sheet #6: Rain Gardens
Fact Sheet #7: Planter Boxes
Fact Sheet #8: Rain Barrels
Fact Sheet #9: Native Plants

Table 2, Green Infrastructure Practices for Small Sites, lists several options for homeowners. While some are fairly simple (splash blocks, rain barrels, and buffer strips), others may require hiring a contractor.

Table 2, Green Infrastructure Practices for Small Sites

<table>
<thead>
<tr>
<th>Site Design Strategies</th>
<th>Vegetative Systems</th>
<th>Permeable Pavements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curb Cutouts</td>
<td>Downspout Disconnections</td>
<td>Rain Barrels</td>
</tr>
<tr>
<td>Space limitations</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Poorly-draining soils</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Steep Slopes</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ease of Site Adapting</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Improves Water Quality</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Flow Control</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Legend

Most Appropriate
Moderately Appropriate
Not appropriate

1 Additional information on where to get a 55-gallon drum and how to construct your own rain barrel can be found on the Honolulu Board of Water Supply website: http://www.hbws.org/cssweb/display.cfm?sid=2091.
Where Can I Get More Information?

The City and County of Honolulu, Department of Facility Maintenance has a website dedicated to providing information, education, and outreach for stormwater efforts on Oahu. The website address is:

www.cleanwaterhonolulu.com

Implementing green infrastructure is not the only way to reduce pollutants from leaving your property; good housekeeping practices can be equally as effective at accomplishing this and are as simple as:

1. Fixing oil leaks on your vehicle and using oil change boxes to dispose of oil properly
2. Minimizing the use of soaps and running water when washing your car
3. Preventing soil and debris from leaving your property
4. Following the labels and using only the recommended amount when applying fertilizer and pesticides
5. Disposing of or composting your grass and tree cuttings properly
6. Picking up and disposing of your pet’s waste
7. Sweeping the sidewalk and gutter in front of your home

Help Protect Our Waters – For Life. E Mālama I Ka Wai Ola.
**Low impact development**, or LID, is an environmentally responsible approach to managing rainfall runoff on your property. When it rains, water flows from rooftops, lawns, and driveways, to streets, gutters, and storm drains, and ultimately to our streams and coastal waters. LID designs are simple and effective ways to stop, slow, or spread the flow of storm water on your property. Altering the flow reduces flooding, gives the water a chance to soak into the ground, or gives you a chance to reuse the water for a healthy yard. By reducing the volume of water runoff, you can also decrease the amount of pollutants washed into our streams and the ocean.

**Be an Everyday Clean Water Hero!**

Consider LID for your home and yard to:
- reduce storm water runoff from your property,
- reduce flooding on your property and in your neighborhood,
- reduce erosion,
- allow rain to replenish our ground water supply,
- prevent pollutants from reaching our streams and the ocean,
- conserve our precious drinking water by reusing runoff to irrigate your yard, and
- save money on your water bill.

**Examples of LID designs to consider:**

- Rain garden
- Permeable hardscape
- Downspout with a splash block
- Mulch groundcover
- Rain barrel
The below listed fact sheets provide additional information you will need to build LID designs into your home:

<table>
<thead>
<tr>
<th>Fact Sheet #</th>
<th>Title</th>
<th>Description</th>
<th>Cost</th>
<th>Installation Difficulty</th>
<th>Regular Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Downspout Disconnection</td>
<td>Some downspouts may be connected directly to the storm drainage system. By detaching the downspouts you can help reduce the volume of water that reaches the streams.</td>
<td>$</td>
<td>Easy</td>
<td>Easy</td>
</tr>
<tr>
<td>3</td>
<td>Downspout Outlet Protection</td>
<td>Downspout outlet protection is a structure at the base of the downspout that reduces the initial impact of the runoff before it hits the ground.</td>
<td>$$</td>
<td>Easy–Medium</td>
<td>Easy</td>
</tr>
<tr>
<td>4</td>
<td>Ground Covers</td>
<td>Ground covers are temporary or permanent means of protecting and stabilizing the soil to prevent soil erosion.</td>
<td>$$</td>
<td>Easy</td>
<td>Easy–Moderate</td>
</tr>
<tr>
<td>5</td>
<td>Permeable Hardscape</td>
<td>Permeable hardscapes allow water to soak into the ground while also reducing the amount of runoff leaving your property.</td>
<td>$$–$$</td>
<td>Medium–Complex</td>
<td>Moderate–High</td>
</tr>
<tr>
<td>6</td>
<td>Rain Gardens</td>
<td>Rain gardens are depressed planted areas where rain water can collect and soak into the soil.</td>
<td>$$</td>
<td>Easy–Medium</td>
<td>Easy</td>
</tr>
<tr>
<td>7</td>
<td>Planter Boxes</td>
<td>Planter boxes are elevated containers with plants that collect and filter rain water. Disconnected downspouts can be redirected to planter boxes to help irrigate the plants.</td>
<td>$$</td>
<td>Easy–Medium</td>
<td>Easy</td>
</tr>
<tr>
<td>8</td>
<td>Rain Barrel</td>
<td>A rain barrel is a catchment system that collects runoff from your roof for reuse to water your lawns and other plants.</td>
<td>$$</td>
<td>Complex</td>
<td>Easy–Moderate</td>
</tr>
<tr>
<td>9</td>
<td>Native Plants</td>
<td>A listing of native plants to use as ground cover, in rain gardens, and planter boxes.</td>
<td>$–$$</td>
<td>Easy–Medium</td>
<td>Easy–Moderate</td>
</tr>
</tbody>
</table>
What is downspout disconnection?
If the downspouts (the vertical pipes) from your roof gutters disappear into the ground, they may be directly connected to the City’s storm drainage system. Downspout disconnection is detaching a downspout from the storm drain system thereby reducing the volume of water entering the system.

Why is downspout disconnection good for the environment?
Rain water discharged onto a permeable area soaks into (infiltrates) the ground, which helps to replenish our ground water supply. Infiltration can also help to filter out sediment and nutrients from the water, which decreases the amount of pollutants washed into our streams and the ocean.

Why is downspout disconnection good for me?
Disconnected downspouts are easier to maintain than those that connect to underground pipes—clogs are easier to reach, and damaged or leaking pipes are easier to inspect and replace. Disconnecting your downspout can also give you the opportunity to harvest the rainwater for reuse in your yard, which can help to lower your water bill.

For more information about ways to harvest and reuse water from your disconnected downspout, check out other Fact Sheets in this Sustainable Practices for Homeowners Series, including:

- Fact Sheet #6: Rain Gardens
- Fact Sheet #7: Planter Boxes
- Fact Sheet #8: Rain Barrels

Disconnected downspout with an extension directing water away from the house
Check for Connections: Identify where your downspouts are located around your house, and see if they disappear into an underground connection. In some cases, you may notice an outlet at the curb or property line that discharges runoff to the street when it rains.

Assess the Area: The easiest and most common disconnections direct runoff into the adjacent vegetated area. If the downspout is located within an impervious area, you will need additional materials to extend the outlet, or consider adding a planter box or rain barrel to capture the runoff for reuse.

Create an Outlet to Your Yard:
1. Using a hacksaw, cut the existing downspout approximately 9 inches from where the downspout enters the underground connection, reattach downspout bracket as needed, and remove the lower portion of the downspout.
2. Cap the standpipe (the portion of the underground system remains on the ground).
3. Crimp the bottom of the downspout with pliers and insert the downspout INTO the elbow (if you put the elbow into the downspout, it will leak). Connect the elbow to the downspout using sheet metal screws. It might be necessary to pre-drill the holes.
4. Insert the elbow into the extension and secure it with sheet metal screws, if necessary.
5. The rainwater should discharge at least five feet away from the house, so direct the extension accordingly. A splash block or other outlet protection can help direct water farther from the house and minimize erosion.

Protect Your Building: Direct the water onto a permeable surface and away from existing structures to avoid damage to the foundation. Do not alter runoff patterns from your property by directing more flow onto your neighbor’s property.

Protect the Ocean: Check for existing downspout outlets that are directed toward an impervious surface that carries runoff and pollutants directly into the storm drain system and out to the stream or ocean. Redirect such outlets to discharge to a permeable area, or capture the water for reuse.

Maintain Downspouts and Outlets: Clean your gutters and downspouts at the beginning of the rainy season and inspect after severe storms. Use a plumber’s or electrician’s snake to clean out any obstructions. Adjust or replace the outlet protection (splash block, gravel, etc.) as needed to prevent erosion at the outlet.

For more Information call the City’s Environmental Concern Line at 768-3300, or visit us online at www.cleanwaterhonolulu.com.
**What is downspout outlet protection?**

Downspouts are the pipes that direct the rain water from your roof to the ground, and downspout outlet protection is a structure at the outlet of the downspout that reduces the initial impact of the runoff before it hits the ground. Common examples include splash blocks and rock dissipaters.

If your downspout connects directly into a storm drain system, consider disconnecting your downspouts and adding an outlet to a permeable surface (see Fact Sheet #2 of the Sustainable Practices for Homeowners Series). You can also consider directing the flow to a rain garden (Fact Sheet #6), planter box (Fact Sheet #7), or rain barrel (Fact Sheet #8).

**Why is downspout outlet protection good for the environment?**

Downspout outlet protection slows down the flow of runoff from your roof and/or spreads it out so it can soak into the ground. Impeding the flow helps to filter out the sediment and nutrients that were washed off your roof and decreases the amount of pollutants carried into our streams and the ocean. Increasing the amount of rain water that soaks into the ground also helps to replenish our ground water supply.

**Why is downspout outlet protection good for me?**

Downspouts can sometimes produce concentrated, high velocity runoff that creates ruts and puddles in your yard. Protecting the ground at the outlet of your downspout helps to minimize erosion and damage on your property.

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**DOWNSPOUT OUTLET PROTECTION**

<table>
<thead>
<tr>
<th>Cost:</th>
<th>LOW to MODERATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation:</td>
<td>EASY to MODERATE</td>
</tr>
<tr>
<td>Maintenance:</td>
<td>EASY</td>
</tr>
<tr>
<td>Types:</td>
<td></td>
</tr>
<tr>
<td>- Vegetation</td>
<td></td>
</tr>
<tr>
<td>- Splash Block</td>
<td></td>
</tr>
<tr>
<td>- Flexible/Retractable Extension</td>
<td></td>
</tr>
<tr>
<td>- Rock Dissipator</td>
<td></td>
</tr>
<tr>
<td>- Rain Chain</td>
<td></td>
</tr>
</tbody>
</table>

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Site Selection: ALL outlets on your property.

Choose wisely. When selecting a downspout outlet protection for your home, consider the amount of runoff, space requirements and visual impact:

- **VEGETATION:** Thick, well-established grass may be adequate for infrequent, low-velocity flows on relatively level ground that slopes away from the building. Concentrated, higher velocity flows may result in erosion. Shade or sun exposure should be considered when selecting the vegetation.

- **SPLASH BLOCK:** A rectangular wedge made of concrete, metal, or plastic, where the lower, wider portion of the wedge faces away from the building to divert water away from the structure. For areas with frequent, heavy rains, choose a splash block with a broad base to spread the runoff over a wider area. The force of the water may cause the block to shift, so inspect splash blocks occasionally and adjust or re-level as needed.

- **FLEXIBLE/RETRACTABLE EXTENSION:** A plastic pipe or tube used to redirect water away from the outlet. Flexible extensions can be angled around corners or into rain catchments like rain gardens, rain barrels, or planter boxes. Retractable extensions occupy less space during dry conditions and automatically unroll to discharge runoff at the beginning of the rain event. Prevent tripping hazards and avoid placing downspout extensions across walkways.

- **ROCK DISSIPATOR:** Recommended option for concentrated, high velocity runoff. Rocks must be properly sized to prevent movement; smaller rocks are more likely to be washed away. Angular rocks, such as gravel, are recommended for high velocity flows because they lock in place and will slow down the water more than smoother stones. Provide a layer of rock at least 2 inches deep. Direct the water away from the building to prevent damage to the structure and/or its foundation. Inspect and adjust rocks as needed; stagnant water can breed mosquitoes.

- **RAIN CHAIN:** A decorative feature used in place of a downspout to slow the flow of water from the gutter. The base of the chain should be secured to the ground and surrounded by vegetation or rocks to minimize erosion.

  **Take out the trash.** Clean your gutters and downspouts at the beginning of the rainy season and inspect after severe storms. Use a plumber’s or electrician’s snake to clean out any obstructions.

  **Prevent damage and floods.** Direct the water away from the building to prevent damage to the structure and/or its foundation. Do not alter runoff patterns from your property by directing more flow onto your neighbor’s property.

  **Double down.** Do more for yourself and the environment with your downspout outlet protection by combining it with another sustainable practice! Rain gardens, planter boxes, and rain barrels can be designed to capture runoff from multiple outlets; read more about these ideas in Fact Sheets #6, #7, and #8 in this series.

For more Information call the City’s Environmental Concern Line at 768-3300, or visit us online at [www.cleanwaterhonolulu.com](http://www.cleanwaterhonolulu.com).
What is a ground cover?
Ground covers are temporary or permanent means of protecting and stabilizing the soil. Ground covers include vegetation, gravel, wood chips, erosion control mixes (ECMs), and mulches.

Why are ground covers good for the environment?
Ground covers can be used to protect areas of bare soil and prevent erosion on your property. They can also slow down the flow of rain water along the ground and filter out sediment and nutrients. Slowing the flow helps to decrease the amount of pollutants washed into our streams and ocean.

Why are ground covers good for me?
Ground covers help to retain moisture in the soil by promoting infiltration and slowing evaporation. Higher soil moisture means less irrigation and you conserve water. Ground covers can also help to prevent weed growth and reduce erosion of soil. Install ground covers on your property to address areas of bare soil or to simply beautify your yard.

GROUND COVERS
Cost: LOW to MODERATE
Installation: EASY
Maintenance: EASY to MODERATE

GROUND COVERS

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Organic Mulches</th>
<th>Erosion Control Mixes</th>
<th>Inorganic Mulches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasses and other low-lying plants.</td>
<td>Grass clippings, wood chips, bark mulch, etc.</td>
<td>Mulch mixture composed of wood fragments, sand, gravel, and stone.</td>
<td>Gravel, stones, brick chips, recycled glass, etc.</td>
</tr>
</tbody>
</table>

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This rain garden at Punahou School’s K–1 campus utilizes several types of ground cover.


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FREE%20Mulch.jpg.htm

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EASY to MODERATE
EASY
LOW to MODERATE
Things to Consider Before Choosing Your Ground Cover:

- **Maintenance Depends on Location and Use:** Decorative ground covers in level landscaping are easy to maintain, but on slopes and in higher-traffic areas, like footpaths or driveways, they require regular inspection and maintenance.

- **Slopes:** Vegetation and erosion control mixes are a good choice for areas with less than a 50% slope. Mulches typically work best in areas with less than a 33% slope. Terraced steps should be considered for steeper areas.

- **Don't Get Washed Away!** Inorganic mulches (stones, gravel) and certain types of vegetation can withstand larger amounts of runoff, but some organic mulches are easily washed away on slopes. Do not use mulches in areas with concentrated water flows.

- **Go Green:** Vegetation is usually the most visually appealing option. Native plants (Fact Sheet #9) are a great option because they are adapted to the climate and often require less fertilizer than other plants. Check with your local garden shop or plant nursery for recommendations.

- **Recycle:** Your yard can be a good source for grass clippings and leaves. Organic mulch is also available from the City; for more information, contact the City’s Recycling Office at 768-3200 or info@opala.org.

- **Go Organic:** Organic mulch will slowly decay and may need to be replaced annually. Keep organic materials at least 6 inches away from building siding to prevent transfer of fungus growth or other unwanted pests.

- **Rake’n’Replace:** Inorganic mulch should be raked regularly to prevent buildup of organic materials. Inorganic mulch may need to be replaced every few years if they tend to work down into the soil.

<table>
<thead>
<tr>
<th>Mulch Material</th>
<th>Depth</th>
<th>Life Span of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass clippings</td>
<td>1–2 inches</td>
<td>1–3 months</td>
</tr>
<tr>
<td>Compost</td>
<td>3–4 inches</td>
<td>6–8 months</td>
</tr>
<tr>
<td>Wood chips</td>
<td>3–4 inches</td>
<td>6–9 months</td>
</tr>
<tr>
<td>Macadamia husks</td>
<td>3–4 inches</td>
<td>8–10 months</td>
</tr>
<tr>
<td>Gravel</td>
<td>3–4 inches</td>
<td>1–2 years</td>
</tr>
</tbody>
</table>

For more Information call the City’s Environmental Concern Line at 768-3300, or visit us online at www.cleanwaterhonolulu.com.
**What is permeable hardscape?**
Permeable hardscape is a hard surface that allows water to soak into the ground, unlike traditional non-permeable hardscapes that result in increased storm water runoff. Turf blocks, porous pavers, and porous pavement are different types of permeable hardscapes that can be used for terraces, walkways, driveways, and overflow parking.

**Why is permeable hardscape good for the environment?**
Permeable hardscapes can slow down the flow of runoff from rooftops, sidewalks, and driveways and filter out sediment and nutrients. Slowing down the flow helps to decrease the amount of pollutants washed into our streams and the ocean. Permeable hardscapes also increase the amount of rain water that soaks into the ground, which helps to replenish our ground water supply.

**Why is permeable hardscape good for me?**
Permeable hardscape can be an environmentally responsible and aesthetically pleasing alternative to traditional pavements like concrete and asphalt. Permeable hardscape can also help to stabilize soil, eliminate puddles, or minimize erosion on your property.

**Site Selection:** Permeable hardscapes work best over sandy or well-drained soils that are relatively flat. They are not suitable for areas near or downslope of loose or eroded materials, as sediment may clog the soil layers.

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**PERMEABLE HARDSCAPE**

<table>
<thead>
<tr>
<th>Cost:</th>
<th>MODERATE to HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation:</td>
<td>MODERATE to COMPLEX</td>
</tr>
<tr>
<td>Maintenance:</td>
<td>MODERATE to HIGH</td>
</tr>
</tbody>
</table>

---

**PERMEABLE HARDSCAPE**

<table>
<thead>
<tr>
<th>Traditional Hardscape</th>
<th>Turf Blocks</th>
<th>Porous Pavers</th>
<th>Porous Pavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt concrete (AC) pavement or concrete pavement</td>
<td>Interlocking concrete or plastic cells that are filled with soil and planted with grass or ground cover. Rain water soaks into the ground in the planting spaces.</td>
<td>Pavers come in various shapes and materials and interlock to create a variety of geometric patterns. Rain water can soak into the ground in the spaces between the pavers.</td>
<td>Porous pavement appears to look like traditional pavement but contains pore spaces that allow rain water to soak into the ground.</td>
</tr>
</tbody>
</table>

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**Healthy Yards ➔ Clean Streams**

Sustainable Practices for Homeowners: PERMEABLE HARDSCAPE

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**Fact Sheet #5**

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**Be an Everyday Clean Water Hero**

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**State of Hawaii**
SUBBASE LAYER

The stone or gravel subbase under the permeable hardscape collects rain water before it is soaked into the ground. Two types of gravel are used; the upper layer uses small-sized gravel to stabilize the hardscape, and the bottom layer uses gravel to store the storm water. Refer to the manufacturer’s instructions for recommended depths and types of gravel.

GEOTEXTILE FABRIC

The non-woven geotextile fabric is installed below the subbase layer. The fabric provides a barrier to prevent fine soil particles from migrating up into the subbase layer and clogging it.

<table>
<thead>
<tr>
<th>Where to use permeable hardscapes</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>On relatively flat slopes, less than 10% grade</td>
<td>Plants in the turf blocks require irrigation</td>
</tr>
<tr>
<td>On sandy soils that absorb water quickly</td>
<td>Higher construction costs than traditional pavement</td>
</tr>
<tr>
<td>Away from erosion-prone areas that could clog the surface</td>
<td>Porous pavers and pavement require regular sweeping and occasional vacuuming to prevent clogging</td>
</tr>
<tr>
<td>Away from where hazardous materials are stored or handled</td>
<td>Proper installation is required; hire a licensed contractor to install these products</td>
</tr>
<tr>
<td>Away from areas where groundwater can be found at shallow depths, 5–6 ft. below the surface</td>
<td></td>
</tr>
</tbody>
</table>
What is a rain garden?
A rain garden is a planted area within a natural or man-made depression in the ground where rain water runoff can collect and soak into the soil. Rain gardens can be designed in any shape, and plants can be selected for areas in the shade or with full sun exposure.

Why is a rain garden good for the environment?
Rain gardens can slow down the flow of runoff from rooftops, sidewalks, and driveways and filter out sediment and nutrients, decreasing the amount of pollutants washed into our streams and the ocean. Rain gardens also increase the amount of rain water that soaks into the soil, which helps to replenish our ground water supply.

Why is a rain garden good for me?
Rain gardens can be a beautiful addition to your yard. A properly designed rain garden can also help to eliminate puddles or minimize erosion on your property.
Site Selection: Locate your rain garden away from buildings and ensure that any overflow will be directed away from them to avoid damage to the foundation. Do not alter runoff patterns from your property by directing more flow onto your neighboring parcels.

Plant Selection: Native plants (Fact Sheet #9) are a great option because they are adapted to the climate and often require less fertilizer than other plants. Choose moisture-tolerant plants for the lowest portion of the garden and drought-tolerant plants for the upper edges of the garden. Check with your local garden shop or plant nursery for recommendations.

If you have to dig: The lowest point of the garden should be no more than 6 inches below the surrounding land, but you may need to dig deeper to install a sublayer of coarser soil for improved drainage. Be careful not to cut or damage any utility lines.

It’s not a wastewater garden! Use your rain garden to collect storm water only. Never reroute water from your sinks, toilets, dishwasher, or laundry washer into a rain garden. Disposal of non-rain water sources could be a violation of regulations related to ground water and wastewater.

For more Information call the City’s Environmental Concern Line at 768-3300, or visit us online at www.cleanwaterhonolulu.com.
What is a planter box?
A planter box is an elevated container of plants that collects and filters rain water. Planter boxes can be used as part of a downspout disconnection system to treat and reuse roof runoff. Planter boxes can be prefabricated containers or constructed in place.

Why is a planter box good for the environment?
Planter boxes use rain water for irrigation. They should be considered to address ponding in an impervious or poorly drained area. As part of a downspout disconnection system, planter boxes can slow down the flow of runoff from your rooftop and filter out sediment and nutrients, decreasing the amount of pollutants washed into our streams and the ocean.

Why is a planter box good for me?
Planter boxes can be a beautiful addition to your yard or patio. Rerouting excess runoff into a planter box can also help to eliminate puddles or minimize erosion on your property.

PLANTER BOX
Cost: LOW to MODERATE
Installation: EASY to MODERATE
Maintenance: EASY
Materials:
- Prefabricated container or construction materials—wood, concrete, brick, etc.
- Soil
- Gravel
- Geotextile fabric
- Native or non-invasive plants with different moisture tolerances
- Garden tools: shovels, rakes, etc.
- Optional: Downspout disconnection/ modification materials (see Fact Sheet #2) and Downspout outlet protection (see Fact Sheet #3)
**Site Selection:** Planter boxes can be used in many locations, including on impervious surfaces, areas that do not drain well, or slopes. Ensure that any overflow from your planter box will be directed away from existing structures to avoid damage to the foundation. Do not alter runoff patterns from your property by directing more flow onto your neighbor’s property.

**Plant Selection:** Native plants (Fact Sheet #9) are a great option because they are adapted to the climate and often require less fertilizer than other plants. Check with your local garden shop or plant nursery for recommendations. Potted plants may require more water than the same plants growing in the ground.

**Rain water, not wastewater:** Use your planter boxes to collect storm water only. Never reroute water from your sinks, toilets, dishwasher, or laundry washer into a planter box; disposal of non-rain water sources could be a violation of regulations related to ground water and wastewater.
What is a rain barrel?
A rain barrel is a catchment system that collects runoff from your roof for reuse.

Why is a rain barrel good for the environment?
Rain barrels capture runoff that might otherwise flow through your yard, potentially picking up sediment and other pollutants on its way to a stream or the ocean. Rain barrels also conserve water. Stored rain water can be used to water lawns, ornamental gardens, and indoor plants.

Why is a rain barrel good for me?
Rain barrels reduce your use of potable (drinking) water for non-potable uses and lower your water bill. Using a rain barrel in your yard demonstrates your commitment to water conservation.

Materials to build your own rain barrel can be purchased from local vendors or ordered online. The Board of Water Supply also offers workshops on rain barrels at the Hālawa Xeriscape Garden.

Lots of (Re)uses!
- Water your lawn
- Water an ornamental garden
- Water indoor and potted plants
- Wash your car or bike
- Rinse the sand off your feet after a trip to the beach

RAIN BARREL
Cost: LOW to HIGH
Installation: COMPLEX
Maintenance: EASY to MODERATE
Tools and Materials:
- Barrel: 55-gallon food grade plastic
- Saw: jig saw or keyhole saw
- Fine-Mesh Screen Material
- Sealant: Caulk, Teflon tape, etc.
- ¾” (or ½”) hose bibb (faucet)
- ¾” (or ½”) hose adapter
- Downspout elbow joint and extensions, if needed
- Optional: Cinder blocks for the base
- Optional: downspout disconnection supplies (see Fact Sheet #2)
Site Selection:
• Where are your downspouts? The closer the rain barrel sits to the existing downspout, the easier it will be for you to reroute the outlet to discharge into the barrel.
• Where will you use the water in your yard? A rain barrel is a gravity flow system, so the rain barrel should be higher than the area to be watered.
• Where do you have space to put a rain barrel? A 55-gallon drum will require about 4 square feet of space.

Build-a-Barrel:
1. Buy a new barrel from a local vendor or buy a used one from a local company that uses barrels for food product storage (Note: barrels that were used to hold chemicals or toxins should never be used to build a rain barrel). Wash the barrel, inside and out.
2. Drill a hole in the side wall near the bottom of the barrel for the hose bibb fitting, leaving enough space to fill a watering can or connect a watering hose.
3. Tap the hole, wrap the threads of the hose bibb with the sealant, and screw into the hole.
4. Optional: add an overflow hose near the top of the barrel to connect to a second container or to direct excess water away from your house.
5. Use the saw to cut a hole at the top of the barrel. Cover the hole with a screen to keep debris out of your rain barrel.
6. Level the area where your rain barrel will sit. Cinder blocks can be used to create a raised base, but make sure it is sturdy and level. A 55-gallon barrel, when full, will weigh over 400 pounds!
7. Connect your gutter to the rain barrel by disconnecting or shortening the downspout pipe. Direct the downspout outlet toward the screen-covered hole using an elbow joint and/or extension.

WARNING: Non-Potable! Do not drink the water stored in your rain barrel.

Maintenance: Clean your gutters and downspouts at the beginning of the rainy season and inspect after severe storms. Check the screen at the top of your rain barrel after each storm to remove debris that can clog or damage the screen. Use a tight-fitting lid to keep children and animals out of the water.

Mosquitoes: Keep the lid of your rain barrel sealed to keep mosquitoes from breeding in the standing water.

Only Rain in the Rain Barrel! Use your rain barrel to collect storm water only. Never reroute water from your sinks, toilets, dishwasher, or laundry washer into a rain barrel; disposal of non-storm water sources could be a violation of regulations related to ground water and wastewater.
What are native plants?
A native plant is a plant that arrived in Hawaii by wind, water, or on the wings of birds and survived in the islands prior to human contact. Native plants should be used instead of non-native plants because native plants are best suited for local conditions. There are a variety of native plants available for purchase at most local nurseries and can be used as groundcover (Fact Sheet #4), in rain gardens (Fact Sheet #6), or in planter boxes (Fact Sheet #7).

The following plant list provides some information on native plants suitable for most home landscapes:

<table>
<thead>
<tr>
<th>GROUNDCOVER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANT NAME</td>
<td>SCIENTIFIC NAME</td>
</tr>
<tr>
<td>‘Ae’ae</td>
<td>Bacopa monnieri</td>
</tr>
<tr>
<td>‘Akulikuli</td>
<td>Sesuvium portulacastrum</td>
</tr>
<tr>
<td>Hinahina</td>
<td>Heliotropium anomalum</td>
</tr>
<tr>
<td>‘Ilima papa</td>
<td>Sida fallax</td>
</tr>
<tr>
<td>Pohinahina</td>
<td>Vitex rotundifolia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHRUBS/BRUSH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANT NAME</td>
<td>SCIENTIFIC NAME</td>
</tr>
<tr>
<td>‘A’ali’i</td>
<td>Dodonaea viscoso</td>
</tr>
<tr>
<td>‘Akia</td>
<td>Wikstroemia uva-ursi</td>
</tr>
<tr>
<td>Pāpala</td>
<td>Charpentiera sp</td>
</tr>
<tr>
<td>‘Uki’uki</td>
<td>Dianella sandwicensis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TREES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANT NAME</td>
<td>SCIENTIFIC NAME</td>
</tr>
<tr>
<td>Bastard Sandalwood</td>
<td>Myoporum sandwicense</td>
</tr>
<tr>
<td>Lonomea</td>
<td>Sapindus oahuensis</td>
</tr>
<tr>
<td>‘Ohi’a Lehua</td>
<td>Metrosideros polymorpha</td>
</tr>
</tbody>
</table>

For additional plant listings see Attachments A-1 and A-2 in the Green Infrastructure Handbook for the State of Hawaii.
HOME AND GARDEN

Green waste and household toxics like paints and fertilizers often make their way into the City and County of Honolulu storm drain system and do not get treated before reaching our streams, wetlands and the ocean. These wastes pollute our drinking water and contaminate waterways, making them unsafe for people and wildlife. Follow these simple tips to prevent pollution and protect your health.

Yard Waste
Blowing or hosing leaves, grass clippings, tree cuttings, fruits and other yard waste into the stream, can clog catch basins and polluting waterways. Sweep or use a mulching leaf vacuum as opposed to a leaf blower. Place green waste at the curb for recycling collection (twice/month scheduled at www.opala.org or call your collection yard) or recycle by composting. Mow high and try grasscycling or leaving grass clippings on your lawn instead of using a grass catcher. The clippings act as a natural fertilizer, and because grass is mostly water, it also irrigates your lawn, conserving water.

Household Hazardous Waste
Household products like pesticides and highly flammable substances like gasoline and kerosene are too dangerous to dump and too toxic to trash. These wastes require special handling and should be taken to the City's hazardous waste contractor at one of the quarterly drop-off events. Call 768-3201 for an appointment.

Painting
Use water-based paints whenever possible. Never clean brushes or rinse paint containers in the street, gutter or near a storm drain. Clean water-based paints in the sink, and let paint residue harden in its container and dispose of it in the trash.

Pet Waste
Preventing pollution is as easy as 1-2-3: Bring a bag, pick it up, and dispose of it properly, in the toilet or trash. No plastic bags are to be flushed down the toilet.

Planting In The Yard
Produce less green waste and save water by planting low maintenance, drought-tolerant trees and shrubs; deeper rooted native plants can help bind loose soil and prevent erosion. Using drip irrigation, soaker hoses or micro-spray systems for plants can also help reduce your water bill and prevent runoff. Consider natural landscaping.

Disconnect Your Downspout
If your home has roof gutters and downspouts, you might be able to easily reduce the impact of your roof runoff on the down-stream waters in your watershed. Disconnect, if necessary, and redirect your down-spout(s) to a discharge location where the water can soak into the ground or install a rain barrel and use the water to reduce your irrigation demands.

Preserve Existing Drainage Patterns
If your property has a drainage ditch or swale, do not fill it in. Do not build anything on top of it, and keep it free of debris which may be washed away.

Conserve Water
Irrigate in the early morning or early evening. Use soaker hoses or drip irrigation versus sprinklers. Use organic mulch around plants. Use native plants, when possible, that have lower requirements for water. Sweep as opposed to washing down with a hose.

Get Involved
As a resident, you can make a difference, both on the job and in your community. When you're at home, share your knowledge with neighbors and friends. To report illegal discharges or to volunteer for a project to mark storm drains with the message, "No Dumping, Drains To Ocean" or cleanup a stream, go to www.cleanwaterhonolulu.com, click on "Contact Us".
Oahu is home to nearly one million residents who have a direct effect on our island environment and water quality.

WHAT IS STORM WATER?
Storm water suggests large quantities of water (from rain, flooding) at any one given time. Basically, homeowners should keep three things in mind: 1) Storm water that stays on their property and soaks in is a resource helping replenish our groundwater; 2) Runoff should stay as clean as possible before making its way to the nearest storm drain; 3) Unlike the sanitary sewer system, anything dumped into the storm drain system usually flows directly into the nearest stream or drainage channel, usually without any treatment to remove pollutants.

With more than 20,000 storm drain inlets, and over 670 miles of storm drains to clean and maintain, we need your help.

WHAT IS POLLUTED RUNOFF?
Because impervious surfaces (roofs, driveways, compacted soil, sidewalks, gutters, roads, parking lots, and other urban or developed land) do not allow rain to soak into the ground, the result is urban runoff.

This runoff becomes polluted by litter, pesticides, fertilizers, sediment from construction, bare soil, oil, pet waste, grass clippings and leaves that it picks up along the way to storm drains. In addition to rain, various human activities like irrigation, car washing, and malfunctioning septic tanks can also be the source of polluted runoff.

When polluted runoff reaches a water body it can have a harmful impact on the plants and animals in and around the water. It can also affect humans who swim or fish in the water, or whose drinking water comes from the water body.

WHAT ARE POLLUTANTS?
“Pollutant” means any waste, cooking or fuel oil, waste milk, waste juice, pesticide, paint, solvent, radioactive waste, hazardous substance, sewage, dredged spoils, chemical waste, rock, sand, biocide, toxic substance, construction waste and material, and soil sediment. The term also includes commercial FOG waste as defined under Revised Ordinances of Honolulu Section 14-5A.1.

HOME IMPROVEMENT TIPS FOR RESIDENTS

Paints, solvents, and other toxic substances used in home improvement projects make their way to the storm drain system, streams, drainage channels and the ocean, usually without treatment to remove pollutants.

WHAT ARE BMPs?
Many simple yet effective methods can be used to help minimize individual runoff. These are called Best Management Practices or BMPs. Some storm water BMPs can be implemented when first planning and building the home and designing the landscape. Others are incorporated into daily activities. The cumulative impact from all residents in a watershed, the land area that “sheds water” to a single body of water, can have a big impact on water quality.

Here are 9 simple actions you can do around your home to be an Everyday Clean Water Hero!

1. **Keep It Clean:** It is your responsibility to keep sidewalks, curbs and gutters in front of your property clean.

2. **No Dumping:** Mark storm drains with the message, “No Dumping, Drains To Ocean,” to help the community make the connection between neighborhood storm drains and local waterways used for drinking water and recreation.

3. **Do It Right:** Use water-based paints whenever possible. Never clean brushes or rinse paint containers in the street, gutter or near a storm drain. Clean water-based paints in the sink, and oil based paints with thinner. Wrap dried paint residue in newspaper or harden in its container and dispose in the trash.

4. **Don’t Be An Oil Drip:** Identify and fix oil leaks on your vehicle; clean up drips and spills with absorbent material; dispose of used oil in an oil change box.

5. **Car Wash:** The best practice is to use a commercial car wash, where the wash water is recycled. When washing your car at home, wash it on grass, gravel or a pervious surface, e.g. grass pavers, so water can soak into the ground. If you wash your car in a driveway or City street, use water and phosphorus-free soap, sparingly, with a bucket, sponge, and nozzle on the end of the hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean.

6. **Cover Up:** Prevent soil and debris from leaving your property.

7. **Read The Label:** Read and follow the label on all fertilizers and pesticides. The label is the law.

8. **Yard Maintenance:** Gather grass, leaves, and yard trimmings for proper disposal or composting.

9. **Pick It Up:** Remove and dispose of pet waste before you leave an area.
HOME CONSTRUCTION WORK, SEDIMENT/LOOSE DIRT
1. Do all home construction work in phases.
2. Schedule grading and excavation projects for dry weather.
3. Seed or mulch to cover bare soil and disturb no more ground than necessary for a project while preserving existing vegetation and managing invasive species.
4. Plant vegetation on slopes and properly maintain your landscaped area.
   Roots from plants bind loose soil and prevent erosion.
5. Control runoff during construction and divert it from areas of exposed soil. Bank or berm around home construction projects and cover loose dirt to prevent erosion and sediment from clogging streams, and storm drains. Reduce runoff velocities with vegetation or check dams.
6. Protect storm drains close to your construction site against runoff with commercial filters or storm drain inlet protection.
7. Collect and dispose of concrete wash water from construction sites promptly and properly. When clearing concrete trucks and vehicles, use off-site facilities or wash in designated and contained areas only.
8. If loose dirt is left on sidewalks or streets at the end of the day, dispose of it in your yard. Do not sweep into streets, gutters and storm drains that drain to streams, channels, and ultimately the ocean.
9. Keep work areas clean. Clear out waste and litter at the work site daily. Sweep paved surfaces that flow to the storm drain system. Collect and dispose of sweepings properly.
10. Do not throw rock, dirt or concrete in the trash. Deliver to the Waimanalo Gulch Sanitary Landfill (Ewa). If your home has roof gutters and downspouts, you might be able to easily reduce the impact of your roof runoff on the downstream waters in your watershed. Disconnect, if necessary, and redirect your downspout(s) to a discharge location where the water can soak into the ground or install a rain barrel and use the water to reduce your irrigation demands.

PAINT AND BUILDING MATERIALS
1. Schedule painting projects for dry weather.
2. Never leave paints and building materials unattended in driveways, sidewalks, streets, gutters or next to storm drains.
3. Prior to painting, prep exteriors using methods such as sandblasting or scraping that do not require water. Use tarps and vacuum to collect all waste in sealed bags.
4. If water must be used during the cleaning process, wet vacuum and dispose of wash water into the sanitary sewer system. Any materials and equipment that require water with application and cleaning such as grout, gypsum compound, dry wall mud, plaster, stucco, or concrete cannot be rinsed down a street, into a gutter or storm drain.
5. When possible, use water-based instead of oil-based paints.
6. Never rinse paint brushes in a floor drain, in the street, or in any area that might flow to the street or into a storm drain.
7. If you use a water-based paint, wash out paintbrushes, pans, sprayers and other equipment in a sink connected to the sewer or over your grass or garden. Use a paint thinner to clean oil-based paints.
8. Have absorbent materials and other cleanup items readily available for spills.
9. If you spill paint, use towels, absorbents or kitty litter immediately to prevent the spill from flowing into the street. If you use kitty litter, be sure to sweep it up and dispose of it in the trash.
10. Latex paints can be hardened in the can, then thrown away. Oil-based paints must be solidified with an absorbent material, such as shredded paper, old rags, or sawdust, then sealed in a plastic bag. An oil change box provides the same results. When thoroughly dry, place the paint can or box on the curb along with your regular trash. Leave the lids off the paint can so the refuse collector can see the paint has hardened.
11. Store paint and building materials under cover with secondary containment.
12. Do not pour paint on the ground or down storm drains. Prevent paint chips from entering the storm drain system.
13. Do not throw liquids in the trash. It may be released from the can when trash is compacted and spill out of the waste collection vehicle onto your street.
14. To empty spray cans, place absorbent material in a plastic bag, spray until can is empty, being careful not to inhale the fumes; leave can in bag, then tie and throw bag away in trash container.
15. Businesses are responsible for all contracted work that takes place on their premises.
16. All discharge routed to the sanitary sewer system requires an Industrial Wastewater Discharge Permit; contact 768-3262 or 768-3263.

CLEANING SIDEWALKS, DRIVEWAYS, OTHER SURFACES
1. Sweep and/or clean the surface of any visible pollutants and dispose of the collected material in the trash
2. Clean surface oil with rags of absorbents. If using granular absorbent materials (kitty litter), sweep and dispose of before washing.
3. After visible pollutants are removed, use water (i.e., no chemicals) only to clean the area.
4. Direct wash water to landscaped or permeable areas within the property.
5. If the discharge enters the City drainage system, it should be filtered through geotextile filter at the drain inlet. Filter fabric should be changed periodically in order to avoid flooding. Filtered residue and fabric should be disposed of through acceptable means. If the treatment system does not work then the discharge shall be terminated until appropriate treatment system is in place.
6. All discharge routed to the sanitary sewer system requires an Industrial Wastewater Discharge Permit; contact 768-3262 or 768-3263.

LAWS AND ORDINANCES
Discharging pollutants to the storm drain system is against the law. Violations of the Clean Water Act can result in fines of up to $25,000 per violation, per day.

The Clean Water Act gave the Environmental Protection Agency authority to implement water pollution control programs. In an effort to comply with the EPA’s mandate, the Revised Ordinance 1006, 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 permit or the water quality standards of the State of Hawaii.”

BE A PART OF THE SOLUTION
The City and County of Honolulu, working under Federal Clean Water Act Guidelines, has a number of public education programs that focus on targeted participation and involvement to minimize and prevent urban runoff pollution. Existing projects such as Adopt-A-Stream/Adopt-A-Block, storm drain marking, World Water Monitoring Challenge, Make a Difference Month, Earth Month, Annual Pearl Harbor Bike Path Cleanup, and workshops provide opportunities to educate an interested and committed neighborhood.

REPORT, WHO TO CALL
As a resident, you can make a difference, both on the job and in your community. When you’re at home, share your knowledge with neighbors and family. As you drive to work, report any illegal discharge.

Spill Response (Hazard Evaluation and Emergency Response)
- Local (HFD): 911 (24/7)
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Storm drain connection license 768-8106, http://www.honolulu ddp.com/ApplicationsForms/SiteEngineeringandSubdivisionPermit

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8. Yard Maintenance: Gather grass, leaves, and yard trimmings for proper disposal or composting.
9. Pick It Up: Remove and dispose of pet waste before you leave an area.
**PLANNING AND LANDSCAPING BMPs**

1. Prevent soil and debris from leaving your property.
2. Sweep excess dirt and sediment runoff from landscaping or watering from sidewalks and driveways into grassed or planted areas.
3. Consider alternatives to impervious or hard surfaces. If you have a choice, consider more porous surfaces such as brick, gravel, wood chips, stone slab or geotextile materials.
4. If areas must be paved, keep paving to a minimum and direct runoff onto vegetated areas, not onto areas that flow to storm drains.
5. Mulch and plant bare soil as soon as possible. Use sediment barriers when necessary.
6. Plant buffer strips of natural vegetation and woody plants to filter and slow runoff alongside waterways.

**YARD WASTE POLLUTION PREVENTION TIPS**

1. Clean leaves and trash out of downspouts, roof and street gutters.
2. Prevent blowing or hosing grass clippings, leaves, fruits, criea guttings and other yard waste into street gutters and storm drains.
3. Prevent dumping of yard waste in streams or drainage channels.
4. Contain and place yard waste at the curb for recycling collection.
5. Grasscycle! Leave grass clippings on lawn after mowing. The nitrogen from the clippings acts as a natural fertilizer.
6. Use fallen leaves for mulching. Consider onsite do-it-yourself shredding and mulching as an option.
7. Compost your biodegradable wastes.
8. When using a yard service, be sure they follow these guidelines.

Discharging pollutants to the storm drain system is against the law. Violations of the Clean Water Act can result in fines of up to $25,000 per violation, per day.

**LAWS AND ORDINANCES**

**Revised Ordinances of Honolulu (ROH)**

**Section 14-12.23 Environmental Quality Control - Violation**

(a) 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 permit or the water quality standards of the State of Hawaii.

(b) It shall be unlawful for any person to discharge or cause to be discharged any storm water runoff associated with industrial activity into any drainage facility which causes a violation of any provision of the city NPDES permit.

(c) It shall be unlawful to discharge domestic wastewater and industrial wastewater into any drainage facility or any separate storm sewer system. It also shall be unlawful to discharge commercial cooking oil waste and commercial FOG waste, as defined under Section 14-5A.1, into any drainage facility or any separate storm sewer system.

(d) It shall be unlawful to discharge any storm water on any public right-of-way which creates a drainage problem or causes a nuisance.

**Section 14-20.1 Cleaning of sidewalks.**

Every property owner whose land abuts or adjoins a public street shall continually maintain, and keep clean, passable and free from weeds and noxious growths, the sidewalk and gutter area which abuts or adjoins the property owner's property; provided, however, that this requirement shall not apply where maintenance of an abutting sidewalk and gutter may be hazardous to the owner, or where a sidewalk and gutter, although abutting the owner's residential property, are so situated that there is no reasonable access from the property to the sidewalk and gutter. The term "sidewalk" as used herein, shall mean that portion of a street between a curb line or the pavement of a roadway, and the adjacent property line intended for the use of pedestrians, including any setback area acquired by the city for road widening purposes. The term "gutter" as used herein, shall mean that paved portion of a roadway immediately adjacent to the curb or that portion of a roadway in concrete and 12 to 14 inches wide immediately adjacent to the curb. (Sec. 20-4.1, R.O. 1978 (1983 Ed.))

**Sec. 41-26.3 Maintenance of streams.**

The owner of any stream has the duty to maintain, dredge and clear such stream so that the natural flow of water runs unimpaired. The owner shall also be responsible for the removal of any debris, vegetation, silt or other items or material of any kind, that may interfere with the natural flow of water. (Added by Ord. 89-59)

**Sec. 41-26.5 Notice of violation—Order to maintain, clear, and remove.**

The chief engineer is authorized and empowered to notify the owner of any stream to maintain and clear any stream, and to remove any debris, vegetation, silt or other items or material of any nature, as is necessary for the proper maintenance of such stream. Such notice shall be as provided for in Section 41-26.12. (Added by Ord. 89-59)

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**Implementation**

As a resident, you can make a difference, both on the job and in your community. When you’re at home, share your knowledge with neighbors and family. As you drive to work, report any illegal discharge.

**Spill Response (Hazard Evaluation and Emergency Response)**

- Local (HFD): 911 (24/7)
- State (HSERC): 586-4249 (business hours), 247-2191 (after hours)

Storm drain connection license 768-8106, http://www.honoluludpp.org/ApplicationsForms/SiteEngineeringandSubdivisionPermit

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For questions or concerns regarding NPDES permitting, storm water illegal discharges, storm water public outreach, and/or storm drain connection licenses, call 768-3268

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Revised May 18 2016
Soil Sediment Runoff From Yards

Background Information

The Clean Water Act was established in 1972 with the goal to make US waters clean enough to be swimmable and fishable. To do this, the Environmental Protection Agency (EPA) established the National Pollutant Discharge Elimination System (NPDES) program.

Since the City’s Municipal Separate Storm Sewer System (MS4), or drainage system, discharges directly to streams and the ocean, the City is required to obtain an NPDES permit from the State Department of Health. This permit requires the City to reduce the amount of pollutants discharged from the City’s MS4 in order to meet the water quality standards of the State of Hawaii to the maximum extent practicable.

The City’s MS4 is the system for the conveyance of storm water, and includes roads and streets with drainage systems, catch basins, curbs, gutters, ditches, man-made channels, and storm drains owned by the City.

Components of the City’s permit include investigating complaints of pollutant discharges, pursuing enforcement action against dischargers, and requiring licenses for all private storm drain connections to the City’s MS4.

What is the law saying?

The City’s MS4 was designed to convey storm water, not trash or pollutants. It is unlawful to discharge pollutants into the City’s storm drainage system.

Soil sediment is a typical pollutant that can flow onto roadways from unvegetated areas. Soil sediment can also get tracked onto the road by vehicles that have been parked on lawns, sidewalk planting strips, or poorly vegetated frontages. When it rains, sediment is picked up by storm water and carried into our streams and goes out to the ocean. Sediment can clog fish gills, cloud water, block sunlight needed by aquatic plants, and smother coral reefs. It can also block or reduce the capacity of the storm drain system causing flooding.

Homeowners are responsible for all conditions on their property that may cause pollution, including poorly vegetated areas that release sediment into the drainage system.

The Ordinance

The Revised Ordinances of Honolulu addresses the potential discharge of pollutants into the City’s MS4 in the following sections:

Sec. 14-12.12 Connection to city-owned separate storm sewer system

(a) (1) All connections from nonmunicipal and private drainage systems to the city-owned separate storm sewer system shall require a storm drain connection license issued by the chief engineer.

Sec. 14-22 Discharge of effluent other than storm water runoff

(a) No person shall discharge any effluent other than storm water runoff onto any public right of way and/or into any drainage facility without first obtaining a permit from the chief engineer.

Sec. 14-12.23 Environmental quality control

(a) 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 permit or the water quality standards of the State of Hawaii.
Examples of BMPs

Plant grass to prevent sediment from flowing from your yard. Temporary control measures should be used until grass has been established.

Filter socks should be placed to contain sediment from flowing out of the landscaping area.

A turf-reinforcing mat over a planted area stabilizes bare soil until vegetation is established.

Mulch cover protects the soil surface, and helps to prevent erosion.

What should I do to prevent sediment pollution from my yard?
Stabilize any bare soil or unvegetated areas with one of the following:
- Vegetation, such as grass or ground cover
- Mulch or gravel
- Pavers, such as turf blocks, which stabilize the ground for parking and allows storm water to infiltrate into the ground.
- Pavement

Contain sediment to prevent it from leaving your property. Keep soil below the sidewalk or curb to prevent soil runoff. One of the following temporary control measures should be maintained until vegetation is fully established to stabilize the soil:
- Place filter socks along the downslope edge
- Install silt fences at the downslope edge
- Place a turf-reinforcing mat over the planted area

For examples of these best management practices (BMPs) to prevent sediment pollution, see photos at left.

Frequently Asked Questions

Q: What is sediment?
A: Sediment is particles of dirt, soil, sand, clay, silt, and other substances that comes from the natural weathering and erosion of the land and decomposing plants.

Q: Why is sediment considered a pollutant? Isn’t soil just a natural material?
A: Although sediment is a natural material, it is considered a pollutant in storm water because of its negative impact on aquatic life and water quality. In addition, the EPA considers it to be the most prevalent pollutant in storm water runoff.

Q: Why are property owners required to maintain their own properties?
A: The EPA has required the State to set limits to sediment discharges to its waterways as an effort to improve water quality. In order to meet the limits set by the State, residents must maintain their property to prevent sediment from being picked up by storm water, which flows into the drainage system and ultimately to State waters. As such, it is against the law to knowingly and willfully discharge pollutants, including soil and sediment, into any drainage facility.

Q: Who is responsible for maintaining the sidewalk area fronting my property?
A: It is the homeowner’s legal responsibility to maintain and keep sidewalks, curb, and gutters in front of their property clean. The sidewalks are for the general public and should also be kept clear of obstructions. For more information, see Revised Ordinances of Honolulu Section 14-20.1.

Q: Are there any penalties for runoff during a natural rain event?
A: Yes, the City could issue warning or fines for sediment runoff. You are required to prevent loose soil, sand, saw dust or any other material that can be washed from your property into the storm drain system.

Enforcement

The City may issue warnings or fines depending on the severity of the violation, which could range from $1,000 to $25,000 per violation per day.

How can I get more information?

Storm Water Quality Branch......................... 768-3268
Environmental Concern Line....................... 768-3300

Visit the City’s website at www.cleanwaterhonolulu.com

Updated 5/12/2016
Be an Everyday Clean Water Hero!

Be AWARE, take ACTION, report ACTIVITIES that adversely affect streams, drainage channels and the ocean.

BE AWARE:
Fertilizers contain nutrients such as nitrogen and phosphorous that can wash into streams, and may cause algae blooms (overgrowth of aquatic plants that smother other aquatic life). These blooms use up the oxygen in the water that fish and other organisms need to breathe. Pesticides (substances that kill bugs and animals) and herbicides (substances that kill weeds and plants) also contain toxic substances that are harmful to humans and aquatic life.

TAKE ACTION:
• Read and follow the label. The label is the law.
• Never apply fertilizers or pesticides if rain is expected within 24 hours.
• Use fertilizer and pesticides sparingly. They can wash off your lawn, driveways and sidewalks into the storm drains and pollute waterways.
• Grasscycle! Leave grass clippings on the lawn after mowing; the nitrogen from the clippings acts as a natural fertilizer. Use organic fertilizers such as manure, mulch or compost in place of chemical fertilizers. Organic fertilizers increase the capacity of the soil to retain water and reduce runoff.
• Landscape with plants that require less water and fewer pesticides.
• Use a soaker hose or drip irrigation where excess water would flow to the sidewalk or street; runoff from these areas flows to the gutter and to storm drains.

REPORT ACTIVITIES:
City’s Environmental Concern Line at 768-3300 or visit www.cleanwaterhono.com

Reference:

Photo shot on location at City Mill 4/2012
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3. **Do It Right**: Use water-based paints whenever possible. Never clean brushes or rinse paint containers in the street, gutter or near a storm drain. Clean water-based paints in the sink, and oil-based paints with thinner. Wrap dried paint residue in newspaper or let it harden in its container and dispose of it in the trash.
4. **Don’t Be An Oil Drip**: Identify and fix oil leaks on your vehicle; clean up drips and spills with absorbent material; dispose of used oil in an oil change box.
5. **Car Wash**: See below
6. **Cover Up**: Prevent soil and debris from leaving your property.
7. **Read The Label**: Read and follow the label on all fertilizers and pesticides. The label is the law.
8. **Yard Maintenance**: Gather grass, leaves, and yard trimmings for proper disposal or composting.
9. **Pick It Up**: Remove and dispose of pet waste before you leave an area.

**COMMERCIAL CAR WASH**

This is the best option to keep harmful chemicals from entering our streams and the ocean. Commercial car wash water is recycled and sent to the wastewater plant for treatment.

**CAR WASHING AT HOME**

When washing your car at home, wash it on grass, gravel or a pervious surface, e.g. grass pavers, so water can soak into the ground (infiltrate), not into the storm drains. If the driveway drains to a place where water can infiltrate, that is okay. If you wash your car in a driveway or City street, use water and phosphorus-free soap sparingly with a bucket, sponge, and nozzle on the end of the hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean. Excess phosphates decrease water quality and harm aquatic life.
Discharging pollutants to the storm drain system is against the law. Violations of the Clean Water Act can result in fines of up to $25,000 per violation, per day.

Know the law to avoid fines. The Clean Water Act gave the Environmental Protection Agency (EPA) the authority to implement water pollution control programs. In an effort to comply with the EPA’s mandate, 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 permit or the water quality standards of the State of Hawaii.”

Be A Part Of The Solution

The City and County of Honolulu, working under Federal Clean Water Act Guidelines, has a number of public education programs that focus on targeted participation and involvement to minimize and prevent urban runoff pollution. Existing projects such as Adopt-A-Stream/Adopt-A-Block, storm drain marking, World Water Monitoring Challenge, Make a Difference Month, Earth Month, Annual Pearl Harbor Bike Path Cleanup, and workshops provide opportunities to educate an interested and committed neighborhood.

Frequently Asked Questions

Residential Car Washing and Storm Water

Q: Is it illegal to wash my car on a City street?
A: No. The City holds a storm water permit that requires implements of an ordinance to prohibit putting anything down the storm drains containing pollutants such as soapy water. The U.S. Environmental Protection Agency has interpreted the phrase “individual residential car washing” as applying to residents of both single family and multi-family residences. Residential car washing is not a violation as it is specifically excluded from the permit. Because of this, the City is using an educational approach for residential car washing. However, the City is still tasked by EPA to reduce the discharge of pollutants to the maximum extent practicable, and will do this primarily by educating the public about best management practices to achieve this requirement.

Q: Why is there a problem with car wash water going into storm drains?
A: Water that enters the storm drain goes into pipes and directly into our streams and ultimately to near shore waters. This wash water (and storm water) does NOT go to the wastewater (sewer) treatment plant like water from your sinks and toilets. It is NOT treated before going into our waterways. Car wash water contains pollutants such as soap, oil, grease, heavy metals, and dirt. Excess phosphates in soapy water can decrease water quality and harm aquatic life.

Q: How can my few gallons of soapy water cause damage?
A: One of the biggest contributions to water pollution is storm water.

Storm water runs off paved surfaces and collects all the pollutants that accumulate between storms, such as soap, oil, grease, dirt, pet waste, and trash. The accumulation of all the pollutants adds up. By doing our part to prevent pollution, washing our cars carefully, picking up after our pets, being careful with pesticides and fertilizers, we can help minimize and prevent pollution.

Q: What about the big fundraising car washes for schools and youth organizations?
A: Fundraiser car washing activities are prohibited if dirty water discharges to the storm drain. Here are some charity car wash options to assist in preventing pollution:
1. Sell commercial car wash coupons from local car wash companies. This allows you to sell tickets any time of year, expand fundraising beyond one event, and doesn’t leave you dependent on the weather.
2. Conduct fundraising events at locations with designated wash areas:
   - Infiltrate runoff into soil or surface, e.g. gravel, grass, permeable surface
   - Retain/detain runoff, e.g. direct wash water to where it can infiltrate or collect wash water
   - Filter runoff slowly through vegetation, e.g. native plants, trees
   - Direct pump harmful wash water to the sanitary sewer system. All discharges routed to the sanitary sewer system require an Industrial Wastewater Discharge Permit; contact 768-3262 or 768-3263. Remember to use water and phosphorous-free soap, sparingly, with a bucket, sponge and nozzle on the end of a hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean.

Q: How do I wash my car to prevent pollution?
A: Wash your car at home and prevent storm water pollution:
- Park your car on grass, gravel or a pervious surface, e.g. grass paving so water can soak into the ground (infiltrate), not into the storm drains. If the driveway drains to a place where water can infiltrate, that is okay.
- Dump soapy water into the sink or a place water can soak into the ground (infiltrate).
- If you wash your car in a driveway or City street, use water and phosphorous-free soap, sparingly, with a bucket, sponge, and nozzle on the end of the hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean. Excess phosphates decrease water quality and harm aquatic life.
- If these options are not available, take your car to a commercial car wash where the wash water is recycled and sent to the wastewater plant for treatment.

Q: Is the City going to fine me for washing my car in the driveway?
A: No. The City is taking a public education approach to residential car washing. Overtime, we expect to see habits change.

Report It, Who to Call

As a resident, you can make a difference, both on the job and in your community. When you’re at home, share your knowledge with neighbors and family. As you drive to work, report any illegal discharge.

Spill Response (Hazard Evaluation and Emergency Response)
- Local (HFD): 911 (24/7)
- State (HSERC): 586-4249 (business hours), 247-2191 (after hours)

Storm drain connection license 768-8106, http://www.honoluludpp.org/ApplicationsForms/SiteEngineeringandSubdivisionPermits

Clean stream hotline 768-7890 (potential flood problem)

Residential code enforcement: 768-8280 (Complaint investigations related to zoning and housing code for one and two family dwellings, sidewalk maintenance, vacant lot overgrowth, animal structures and setbacks)

For questions or concerns regarding NPDES permitting, storm water illegal discharges, storm water public outreach, and/or storm drain connection licenses, call 768-3268
Car care tips for residents

Oahu is home to nearly one million residents who have a direct effect on our island environment and water quality.

WHAT IS STORM WATER?
Stormwater suggests large quantities of water (from rain, flooding) at any one given time. Basically, homeowners should keep three things in mind: 1) Storm water that stays on their property and soaks in is a resource helping replenish our groundwater; 2) Runoff should stay as clean as possible before making its way to the nearest storm drain; 3) Unlike the sanitary sewer system, anything dumped into the storm drain system usually flows directly into the nearest stream or drainage channel, usually without any treatment to remove pollutants.

With more than 20,000 storm drain inlets, and over 670 miles of storm drains to clean and maintain, we need your help.

WHAT IS POLLUTED RUNOFF?
Because impervious surfaces (roofs, driveways, compacted soil, sidewalks, gutters, roads, parking lots, and other urban or developed land) do not allow rain to soak into the ground, the result is urban runoff.

This runoff becomes polluted by litter, pesticides, fertilizers, sediment from construction, bare soil, oil, pet waste, grass clippings and leaves that it picks up along the way to storm drains. In addition to rain, various human activities like irrigation, car washing, and malfunctioning septic tanks can also be the source of polluted runoff.

When polluted runoff reaches a water body it can have a harmful impact on the plants and animals in and around the water. It can also affect humans who swim or fish in the water, or whose drinking water comes from the water body.

WHAT ARE BMPs?
Many simple yet effective methods can be used to help minimize individual runoff. These are called Best Management Practices or BMPs. Some stormwater BMPs can be implemented when first planning and building the home and designing the landscape. Others are incorporated into daily activities. The cumulative impact from all residents in a watershed, the land area that “sheds water” to a single body of water, can have a big impact on water quality.

Here are 9 simple actions you can do around your home to be an Everyday Clean Water Hero!

1. Keep it Clean:  It is your responsibility to keep sidewalks, curbs and gutters in front of your property clean.
2. No Dumping:  Mark storm drains with the message, “No Dumping, Drains To Ocean,” to help the community make the connection between neighborhood storm drains and local waterways used for drinking water and recreation.
3. Do It Right:  Use water-based paints whenever possible.  Never clean brushes or rinse paint containers in the street, gutter or near a storm drain.  Clean water-based paints in the sink, and oil based paints with thinner.  Wrap dried paint residue in newspaper or harden in its container and dispose in the trash.
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5. Car Wash:  The best practice is to use a commercial car wash, where the wash water is recycled.  When washing your car at home, wash it on grass, gravel or a pervious surface, e.g. grass pavers, so water can soak into the ground.  If you wash your car in a driveway or City street, use water and phosphorus-free soap, sparingly, with a bucket, sponge, and nozzle on the end of the hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean.
6. Cover Up:  Prevent soil and debris from leaving your property.
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8. Yard Maintenance:  Gather grass, leaves, and yard trimmings for proper disposal or composting.
9. Pick It Up:  Remove and dispose of pet waste before you leave an area.

Environmental Concern Line 768-3300
www.cleanwaterhonolulu.com
CAR CARE POLLUTION PREVENTION TIPS

1. Recycle your waste oil. A best practice is to have your oil changed by a shop that recycles their waste oil.
2. If you change your own oil, use an “oil change box”. Change your oil away from storm drains and have old rags or other absorbent materials available to respond in case of a spill.
3. Recycle your antifreeze/coolant. A best practice is to go to a shop that recycles their coolants. Used coolants should not be flushed down the drain because they contain pollutants that may cause problems for wastewater treatment plants. Refer to http://www.opala.org/solid_waste/Hazardous_Waste.html#absorb
4. Check your radiator hoses when changing your oil and inspect your car at the first sign of coolant leak. Check and repair leaks. If you find yourself adding fluids monthly, weekly, or even daily or discover spots in your driveway, make repairs right away.
5. Clean up leaks or spills promptly, using dry absorbent materials, such as kitty litter and a broom. Do not wash down garage or driveway surfaces into the street or storm drain.
6. Return used batteries to the place you bought them.
7. To arrange for free auto junking services for your car, call 532-4325 or go to Satellite City Hall. To report abandoned auto, call 733-2530.
8. Do not store used vehicle parts in areas that drain to a storm drain.
9. Use a commercial car wash where wash water is recycled and sent to the wastewater plant for treatment.
10. When washing your car at home, wash it on grass, gravel or a pervious wastewater plant for treatment.

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(a) 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 permit or the water quality standards of the State of Hawaii.
(b) It shall be unlawful for any person to discharge or cause to be discharged any storm water runoff associated with industrial activity into any drainage facility which causes a violation of any provision of the city NPDES permit.
(c) It shall be unlawful to discharge domestic wastewater and commercial wastewater into any drainage facility or any separate storm sewer system.
(d) It shall be unlawful to discharge any storm water on any public right-of-way which creates a drainage problem or causes a nuisance.

Section 14-20.1 Cleaning of sidewalks.

Every property owner whose land abuts or adjoins a public street shall continually maintain, and keep clean, passable and free from weeds and noxious growths, the sidewalk and gutter area which abuts or adjoins the property owner’s property; provided, however, that this requirement shall not apply where maintenance of an abutting sidewalk and gutter may be hazardous to the owner, or where a sidewalk and gutter, although abutting the owner’s residential property, are so situated that there is no reasonable access from the property to the sidewalk and gutter. The term "sidewalk" as used herein, shall mean that portion of a street between a curb line or the pavement of a roadway, and the adjacent property line intended for the use of pedestrians, including any setback area acquired by the city for road widening purposes. The term "gutter" as used herein, shall mean that paved portion of a roadway immediately adjacent to the curb or that portion of a roadway in concrete 12 to 14 inches wide immediately adjacent to the curb. (Sec. 20-4.1, R.O. 1978 (1983 Ed.))

Sec. 41-26.3 Maintenance of streams.
The owner of any stream has the duty to maintain, dredge and clear such stream so that the natural flow of water runs unimpared. The owner shall also be responsible for the removal of any debris, vegetation, silt or other items or material of any kind, that may interfere with the natural flow of water. (Added by Ord. 89-59)

Sec. 41-26.5 Notice of violation—Order to maintain, clear, and remove.
The chief engineer is authorized and empowered to notify the owner of any stream to maintain and clear any stream, and to remove any debris, vegetation, silt or other items or material of any nature, as is necessary for the proper maintenance of such stream. Such notice shall be as provided for in Section 41-26.12. (Added by Ord. 89-59)
All storm drain connections to the City's Municipal Separate Storm Sewer System

Background Information

The Clean Water Act was established in 1972 with the goal to make US waters clean enough to be swimmable and fishable. To do this, the Environmental Protection Agency (EPA) established the National Pollutant Discharge Elimination System (NPDES) program.

Since the City's Municipal Separate Storm Sewer System (MS4), or drainage system, discharges directly to streams and the ocean, the City is required to obtain an NPDES permit from the State Department of Health. This permit requires the City to reduce the amount of pollutants discharged from the City's MS4 in order to meet the water quality standards of the State of Hawaii to the maximum extent practicable.

The City's MS4 is the system for the conveyance of storm water, and includes roads and streets with drainage systems, catch basins, curbs, gutters, ditches, man-made channels, and storm drains owned by the City.

Components of the City’s permit include investigating complaints of pollutant discharges, pursuing enforcement action against dischargers, and requiring licenses for all private storm drain connections to the City’s MS4.

What is the law saying?

The City’s MS4 was designed to convey storm water, not trash or pollutants. All connections from non-municipal and private drainage systems to a City drainage facility must have a storm drain connection license. This license is issued to the property owner (see 'Frequently Asked Questions' on the back of this page for definition). The property owner is responsible for the care and maintenance of the private drainage system and should prevent pollutants from entering the City’s drainage system to the maximum extent practicable.

Any private storm drain system that is connected to the City’s MS4 without a license issued to the property owner is considered to be an illegal storm drain connection.

The Ordinance

The Revised Ordinances of Honolulu (ROH), Section 14-12.12 describes the license and defines a private storm drainage connection as:

“A) Private Storm Drain Connection Licenses

(1) All connections from non-municipal and private drainage systems to the city-owned separate storm sewer system shall require a storm drain connection license issued by the chief engineer.

(8) Where a private storm drain connection is common to one or more parcels and is owned by more than one property owner, each property owner is required to have a private drain connection license and be responsible for the maintenance of the common private drainage system.

D) Private Storm Drain Connections

(1) Any private storm drain system that is connected to the city-owned separate storm sewer system without a license issued to the property owner of record shall be considered an illegal storm drain connection.

(3) Whenever a property owner is cited for an illegal private storm drain connection to the city-owned separate storm sewer system, the property owner shall be given 90 days after the date of the citation to obtain a connection license. The city will issue a connection license to the property owner without penalty within the 90-day period provided, however, no nonstorm water is being discharged into the city-owned separate storm sewer system. After the 90-day period, the property owner shall be in violation of the provisions of Article 12 of this chapter.”
Examples of Connections

A corrugated hose connected to the downspout discharges runoff directly into the gutter.

A sidewalk culvert conveys runoff directly to the gutter.

A pipe connects runoff from a private parking lot directly into a drainage channel.

An underground pipe from private property connects to a City storm drain manhole.

What are my options?

A) Disconnect your connection to the City’s MS4 or
B) Apply for a storm drain connection license. The online application process is:
   2. Click on Forms in the left bar.
   3. Scroll down to Private Storm Drain Connections.
   4. Click on “Application” to download the application.
   5. Complete and send in per the instructions on the form.
Or Call the Department of Planning and Permitting (DPP) at 768-8106

Frequently Asked Questions

Q: What is considered a storm drain connection?
A: According to Section 14-12.2 of the Revised Ordinances of Honolulu (ROH), a private storm drain connection means “any conveyance of storm water, including but not limited to any drainage pipe, ditch, or swale connected to any drainage facility or separate storm sewer system, including any curb and gutter.” Examples of connections include underground pipes or above-ground hoses that convey runoff, such as from roof downspouts, directly to a gutter, channel, or drainage structure. See photos to left.

Q: Who is responsible for obtaining the storm drain connection license?
A: The property owner is responsible for obtaining this license. A property owner is defined in ROH Section 14-12.2 as, “the fee simple owner of record, lessee of record, administrator, administratrix, executor, executrix, personal representative, receiver, trustee, property management agent, or any other individual, corporation, or unincorporated association who has the use, control or occupation of land with claim of ownership whether the owner’s interest be in absolute fee or a lesser estate.”

Q: Why does the City require licenses for storm drain connections?
A: The requirement for licenses for private drain connections is part of the City’s NPDES permit. The main reason for requiring licenses is to detect and eliminate any illegal discharges or pollutants from entering the drainage system through private drain connections.

Q: I inherited an old home where I think my yard drains and downspouts have been connected to the City’s MS4. Do I need a private drain connection license or can my connections remain under a “Grandfather” rule?
A: There is no “grandfather” rule, you need to obtain a private drain connection license. All direct connections, including existing ones, designed for the conveyance of storm water from non-municipal and private drainage systems to the City’s MS4 require a license. The license allows existing drain connections to remain in place. If you do not wish to obtain the license, you must disconnect your piped connection.

Q: What can I do with the storm water if I disconnect my connection?
A: You can direct the runoff toward a landscaped area or planter box to use the runoff for irrigation or you could capture the runoff in a rain barrel for later use as irrigation.

Enforcement

The City may issue warnings or fines depending on the severity of the violation, which could range from $1,000 to $25,000 per violation per day.

How can I get more information?

Storm Water Quality Branch.......................... 768-3268
Environmental Concern Line......................... 768-3300

Visit the City’s website at www.cleanwaterhonolulu.com

Updated 5/12/2016
PET WASTE TIPS FOR RESIDENTS

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With more than 20,000 storm drain inlets, and over 670 miles of storm drains to clean and maintain, we need your help.

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This runoff becomes polluted by litter, pesticides, fertilizers, sediment from construction, bare soil, oil, pet waste, grass clippings and leaves that it picks up along the way to storm drains. In addition to rain, various human activities like irrigation, car washing, and malfunctioning septic tanks can also be the source of polluted runoff.

When polluted runoff reaches a water body it can have a harmful impact on the plants and animals in and around the water. It can also affect humans who swim or fish in the water, or whose drinking water comes from the water body.

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5. Car Wash: The best practice is to use a commercial car wash, where the wash water is recycled. When washing your car at home, wash it on grass, gravel or a pervious surface, e.g. grass pavers, so water can soak into the ground. If you wash your car in a driveway or City street, use water and phosphorous-free soap, sparingly, with a bucket, sponge, and nozzle on the end of the hose to conserve water and minimize the amount of phosphates entering storm drains, streams and the ocean.

6. Cover Up: Prevent soil and debris from leaving your property.

7. Read The Label: Read and follow the label on all fertilizers and pesticides. The label is the law.

8. Yard Maintenance: Gather grass, leaves, and yard trimmings for proper disposal or composting.

9. Pick It Up: Remove and dispose of pet waste before you leave an area.

Environmental Concern Line 768-3300
www.cleanwaterhonolulu.com
PET WASTE POLLUTION PREVENTION TIPS

1. Clean up after pets fully and completely.
2. Carry a clean up device (i.e., bag, scooper) when you walk your dog.
3. Bag and dispose of pet waste in a closed trash receptacle, refuse container or toilet, but do not flush plastic bags down the toilet. Always observe and adhere to posted signs for pets and other animals.
4. Do not place bagged or un-bagged pet waste in a storm drain or hose pet waste towards the sidewalk, gutter, street or storm drain.
5. Wash your hands with warm, soapy water after dealing with pet waste.

KNOW THE LAW

Discharging pollutants to the storm drain system is against the law. Violations of the Clean Water Act can result in fines of up to $25,000 per violation, per day.

The Clean Water Act gave the Environmental Protection Agency authority to implement water pollution control programs. In an effort to comply with the EPA’s mandate, 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 permit or the water quality standards of the State of Hawaii.”

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The Hawaiian Humane Society plays an ever evolving role as a mediator on the changing relationships between people and animals. From its active shelter in the heart of Honolulu, the Society is the focal point of the animal community. Visit their website at http://www.hawaiianhumane.org/.

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(b) It shall be unlawful for any person to discharge or cause to be discharged any storm water runoff associated with industrial activity into any drainage facility which causes a violation of any provision of the city NPDES permit.
(c) It shall be unlawful to discharge domestic wastewater and industrial wastewater into any drainage facility or any separate storm sewer system. It also shall be unlawful to discharge commercial cooking oil waste and commercial FOG waste, as defined under Section 14-5A.1, into any drainage facility or any separate storm sewer system.
(d) It shall be unlawful to discharge any storm water on any public right-of-way which creates a drainage problem or causes a nuisance. (Sec. 16-6.23, R.O. 1978 (1987 Supp. to 1983 Ed.); Am. Ord. 92-122, 96-34, 02-14)

City and County ordinance against littering includes a provision that applies to animals. If your pet deposits feces on private or public property, you are required to clean it up.

Section 7-2.4(b) General Requirements.
Enclosures for animals, farm animals and poultry shall meet all applicable zoning and building code requirements for structures; shall not be located within anyone required front, side or rear yard setback; and shall meet all other applicable sanitation requirements. Please note that these enclosures must have a roof.

Section 7-2.5 Special Requirements.
(c) Dogs. The number, four months of age or older, shall not exceed 10 per household.
(d) Chickens and peafowl. The number of chickens or peafowl shall not exceed two per household. (added by ord. 90-55; Am. Ord. 04-42)

Section 29-4.4(2)(9) Prohibited Activities.
No person shall permit an animal owned by such person or while in the person’s custody to excrete any solid waste in any public place or on any private premises not the property of such owner; provided, however, that nothing herein shall affect the duty of the property owner or occupier to keep the premises free of litter and provided further that no violation shall occur if the owner of the offending animal promptly and voluntarily removes the animal waste.

Section 14-20.1 Cleaning of sidewalks.
Every property owner whose land abuts or adjoins a public street shall continually maintain, and keep clean, passable and free from weeds and noxious growths, the sidewalk and gutter area which abuts or adjoins the property owner’s property; provided, however, that this requirement shall not apply where maintenance of an abutting sidewalk and gutter may be hazardous to the owner, or where a sidewalk and gutter, although abutting the owner’s residential property, are so situated that there is no reasonable access from the property to the sidewalk and gutter. The term “sidewalk” as used herein, shall mean that portion of a street between a curb line or the pavement of a roadway, and the adjacent property line intended for the use of pedestrians, including any setback area acquired by the city for road widening purposes. The term “gutter” as used herein, shall mean that paved portion of a roadway immediately adjacent to the curb or that portion of a roadway in concrete and 12 to 14 inches wide immediately adjacent to the curb. (Sec. 20-4.1, R.O. 1978 (1983 Ed.))

Sec. 41-26.5 Notice of violation—Order to maintain, clear, and remove.
The chief engineer is authorized and empowered to notify the owner of any stream to maintain and clear any stream, and to remove any debris, vegetation, silt or other items or material of any nature, as is necessary for the proper maintenance of such stream. Such notice shall be as provided for in Section 41-26.12. (Added by Ord. 89-59)

The Hawaiian Humane Society (HHS) can enforce on the animal nuisance law. The exception are rooster related nuisances that are enforced by HPD.
FACT SHEET

Dechlorinated Swimming Pool Water Discharges

The City’s NPDES permit allows discharges of dechlorinated swimming pool water into the City’s storm drain system. However, City ordinances require that an effluent discharge permit be obtained prior to the discharge. The fee for the permit is $200. Call the Department of Facility Maintenance (DFM) at 768-3268 to obtain a permit application.

**HOW CAN I DRAIN MY POOL?** You should use the following best management practices (BMPs):

- After obtaining an effluent discharge permit, contact the Department of Facility Maintenance at 768-3268 at least 72 hours prior to discharge. Keep a record of the discharge and provide the following information: your name, your company name (if applicable), address where the pool is located, number of gallons to be drained, date of discharge, pH, and residual chlorine level. The chlorine level should be 0.01 parts per million or less. You may also fax the above information to 768-4609.

- Discharges into the City’s storm drain system should be via pump and hose directly into a storm drain inlet or catch basin. Do not allow effluent to run down the street or gutter.

- Discharges to the State’s storm drain system require a permit from the State. For more information, call the Department of Transportation at 831-6714 or visit www.stormwaterhawaii.com.

- If there is a drain inlet within the property, you must determine where the effluent would go before using the inlet. If it is connected to the State’s or City’s storm drain system, a drain connection permit is required from the State or City.

- As an alternative, you may reuse swimming pool effluent to irrigate a landscaped area, as long as the effluent remains on the property. No permit is required.

- If there is no storm drains available, you may discharge the effluent into the sanitary sewer. A permit may be required. Call the Department of Environmental Services, Regulatory Control Branch at 768-3261, 768-3263, 768-3271, or 768-3272 for more information.

**ARE THERE OTHER DISCHARGES THAT ARE PROHIBITED AT MY POOL?**

- Discharges from swimming pool backwash water are prohibited from entering the City’s storm drain system.

**HOW CAN I GET ADDITIONAL INFORMATION?**

- For more information, please call the Storm Water Quality Branch of DFM at 768-3268.