

## Chapter 4 BMPs for Commercial and Industrial Activities

This chapter coordinates with the worksheet completed in Chapter 2. That worksheet and the BMPs are organized by the different activities that businesses perform. If the listed activity is performed indoors and all discharges from the activity are controlled (e.g., process water, wash water, lubricants, solvents, fugitive dust, granular material, blowdown waste, etc.) such that no exposure to stormwater occurs, then no new BMPs for that activity are required. However, if the column for activities performed outdoors was checked, match the number from the worksheet to the activities listed in this section to find the BMPs suggested.

Contact the City of Tacoma Source Control Unit at 253-591-5588 for more information or technical assistance. Assistance can be provided over the phone or at on-site consultations.

**Every person/business in Tacoma is required to use BMPs as outlined in this manual.** Utilizing additional BMPs to further protect water quality is encouraged.

Some businesses are or will be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges. These permits are issued and regulated by the Washington State Department of Ecology.

There are several BMPs contained in this chapter that may also apply to residences and other non-commercial or non-industrial sites.

### 4.1 BMPs To Consider for all Activities

Some common best management practices that should be considered for all activities include:

- Avoid the activity or reduce its occurrence.
- Move the activity indoors if possible.
- Clean up spills quickly.
- Use less material.
- Use the least toxic materials available.
- Create and maintain vegetated areas near activity locations.
- Locate activities as far as possible from surface drainage paths.
- Keep storm drain systems clean.
- Reduce, reuse, and recycle as much as possible.
- Be an advocate for stormwater pollution prevention.
- Report violators to Source Control Unit 253-591-5588.
- Provide oversight and training.
- Sweep or vacuum to control dust and debris.
- Regularly inspect, clean, and repair all facilities and BMPs.

## 4.2 Washing Best Management Practices

**Applicability:** These BMPs encompass washing practices related to various commercial washing activities. Typically, all washwater must be discharged to the sanitary sewer system, collected for off-site disposal, or recycled. Some washing practices may discharge their washwater into nearby landscaped areas or into the stormwater system with proper pretreatment. Table 4 - 1 shows the allowable discharge location for various washing activities. Following the table are required and recommended BMPs for specific washing activities. Below are the required and recommended BMPs that apply to all washing practices.

BMPs for homeowners can be found in Chapter 3.

### **Required BMPs** for all washing activities:

- Follow Table 4 - 1, "Discharge Options for Businesses" to determine the required discharge location based upon washing activity.
- Illicit connections to the storm drainage system must be eliminated. See BMP S101 for detailed information.
- Employees must be educated to control washing operations to prevent stormwater contamination.
- Follow the Environmental Services Source Control Oil Water Separator Policy for Discharges to Sanitary Sewer as appropriate. The policy is available at [www.cityoftacoma.org/stormwater](http://www.cityoftacoma.org/stormwater).
- For facilities with a dedicated wash pad, at a minimum the pad must be equipped with a catch basin/sediment trap that discharges through a tee outlet to the sanitary sewer. Discharges to the sanitary sewer system must meet the discharge limits of TMC 12.08 before discharge is allowed. Sampling, testing, and pretreatment of the wastewater may be required to meet limits.
- If any washing of vehicle or equipment that contains oils is to be conducted on the wash pad an oil/water separator will be required. See the Environmental Services Oil Water Separator Policy for Discharges to the Sanitary Sewer at [www.cityoftacoma.org/stormwater](http://www.cityoftacoma.org/stormwater) for additional guidance.
- Contact City of Tacoma Source Control at 253-591-5588 for assistance.

### **Recommended BMPs** for all washing activities:

- Limit the amount of water used in washing activities.
- Recycle washwater when possible for subsequent washings.
- If soaps and detergents are used, use the least toxic cleaner capable of doing the job. Select non-phosphate detergents when possible.
- Cover and/or contain the cleaning activity inside a building to separate uncontaminated stormwater from the pollutant sources.

**Table 4 - 1: Discharge Options for Businesses<sup>a</sup>**

Item to be Washed	Sanitary Sewer <sup>b</sup>	Collect/Closed-Loop Recycle/Haul	Landscape/Soil <sup>c</sup> No Soaps or Chemicals	Storm Drain No Soaps or Chemicals
<b>Tools, Rental &amp; Construction Equipment, &amp; Machinery</b>	OK	OK	Not Allowed	Not Allowed
Backhoes	OK	OK	Note 2	Not Allowed
Lawn mowers	OK	OK	Note 2	Not Allowed
Cooling towers	OK	OK	Not Allowed	Not Allowed
<b>Cooking Equipment</b>				
Mats	OK	OK	Not Allowed	Not Allowed
Floors				
Exhaust fans & hoods				
<b>Buildings &amp; Structures</b>				
Exteriors/roofs	OK	OK	Notes 2 & 3	Notes 2 & 3
Windows				
HVAC systems				
Sidewalks				
Parking	OK	OK	Not Allowed	Not Allowed
<b>Interiors</b>				
Floor stripping	OK	OK	Not Allowed	Not Allowed
Carpets				
Windows				
<b>Vehicles<sup>d</sup></b>				
New/Used car lots	OK	OK	Notes 1 & 2	Note 2
Golf carts	OK	OK	Notes 1 & 2	Not Allowed
Import/Export equipment	OK	OK	Not Allowed	Not Allowed
Charity car washes	OK	OK	Notes 1 & 2	Not Allowed
RV, truck, auto detailing & engine washing	OK	OK	Not Allowed	Not Allowed
Mobile truck-fleet washers	OK	OK	Not Allowed	Not Allowed
Boats	OK	OK	Not Allowed	Not Allowed

a. These are guidelines only and not meant to be all-inclusive. The City of Tacoma reserves the right to diverge from this, depending upon site-specific conditions.

b. Discharge may require pretreatment per TMC Chapter 12.08.

c. Discharges to the ground may require permission from the Tacoma/Pierce County Health Department if the site is located within the South Tacoma Groundwater Protection District.

d. Specific Guidelines are available for automatic wand and mobile fleet washers. Contact City of Tacoma Source Control at 253-591-5588.

**Note 1:** Meet requirements of WDOE publication WQR 95-56 *Vehicle and Equipment Washwater Discharges*. Solids must be collected and no visible sheen is allowed.

**Note 2:** Cold water only. No detergents or other cleaners may be used.

**Note 3:** No pollutants after pretreatment. Work area must be pre-scraped and/or pre-swept. Please refer to Volume 2, Chapter 3, Standards and Specifications for Best Management Practices (BMPs) for pretreatment BMPs.

### 4.2.1 Cleaning or Washing of Tools, Equipment, and Machinery

**Applicability:** This activity applies to businesses and public agencies that clean manufacturing equipment such as saws, grinders, screens, and other processing devices outside of buildings, and to businesses engaged in pressure washing of engines, equipment, and portable objects.

Pollutant sources include toxic hydrocarbons, organic compounds, oils and greases, nutrients, heavy metals, pH, suspended solids, biochemical oxygen demand (BOD), and chemical oxygen demand (COD).

**Required BMPs** for cleaning or washing of tools, machinery, equipment, and portable objects:

- All washwater shall either:
  - Be discharged to the sanitary sewer,
  - Be temporarily stored before proper disposal, or
  - Be recycled.

See BMP S103: Discharge Process Wastewater to a Sanitary Sewer, Holding Tank, or Water Treatment System for additional information.

- Pressure washing must be conducted in a designated area (such as a permanent or temporary wash pad) provided with some means of capturing the washwater, and stormwater run-on prevention. Permanent wash pads must drain to the sanitary sewer system through an approved pretreatment device. See BMP S106 and S107 for information on sumps (or holding tanks) and run-on prevention

### 4.2.2 Cleaning or Washing of Cooking Equipment

**Applicability:** This activity applies to businesses that clean cooking equipment such as grills, vent filters, exhaust hoods, grease traps, floors and floor mats. Washing the outside of buildings, sidewalks, and paved areas is covered in the Building Structures and Related Equipment section below.

Pollutants of concern consist of pH, oil and grease, nutrients, suspended solids, and biochemical oxygen demand (BOD).

**Required BMPs** for cleaning or washing of cooking equipment:

- Cleaning and washing of cooking equipment shall take place indoors with drainage to the sanitary sewer system, holding tank, or process treatment system or captured using a tub or similar device to contain all the washwater. The washwater shall be recycled or disposed into the sanitary sewer system, holding tank, or process treatment system. Provisions must be in place to neutralize the washwater rinsate prior to discharge to the sanitary sewer system.
- If washing cannot be accomplished indoors, the washing must take place on a pad or be isolated in a way that all washwater drains to the sanitary sewer, holding tank, or process treatment system.
- Washwater shall not be discharged to the storm drainage system.

- Washwater from cleaning roof-top equipment, such as exhaust fans, shall be captured and disposed to the sanitary sewer. Use of wet/dry vacuums, temporary berms or containers, such as plastic pools, are possible ways to capture this water.
- Paved washing areas must be swept daily to collect loose solid materials for proper disposal.
- Greasy buildup on cooking equipment must be removed and properly disposed prior to washing to reduce the amount of material that can potentially contaminate the washwater. Washing must either take place on a wash pad connected to the sanitary sewer, or the wastewater must be collected and disposed in the sanitary sewer.
- See BMP S103 for detailed drainage requirements and BMP S107 for methods of run-on prevention. If connecting a wash area to the sanitary sewer, permits must be obtained from the City of Tacoma by calling the Permit Counter at 253-591-5030.
- If a holding tank is used for storage of washwater, the contents must be pumped out before it is full and disposed properly in an approved manner.

**Recommended BMPs** for cleaning or washing of cooking equipment:

- Discharge greasy washwater to the building's grease interceptor if one is available.
- Install grease protection if none is available.
- If washing must take place outdoors, provide a cover over the designated wash area to keep rain from falling on dirty equipment and producing contaminated runoff.

### **4.2.3 Building Structures and Related Equipment**

**Applicability:** This activity applies to the washing of buildings, roofs, cooling towers, structures, sidewalks, and parking lots with low or high pressure water. This also includes removing graffiti.

Pollutants generated include heavy metals, pH, suspended solids, grit, paint chips, and biochemical oxygen demand (BOD).

**Required BMPs** for washing building structures and related equipment:

**General:**

- Pressure washing of building facades, rooftops, pavement, and other large objects must be conducted in such a way that all of the runoff is collected for proper disposal.
- Washwater shall be discharged to the sanitary sewer system with appropriate pretreatment to remove solids. Sediment removal BMPs include those as described in Volume 2 and include measures such as check dams, sorbent booms, and catch basin inserts. Temporary curbs, dikes, or berms may be needed to direct the washwater to a single collection point. Wet/dry vacuums, run-dry sump pumps, or educators may be used to collect the water for proper disposal to the sanitary sewer system. Discharges to the sanitary sewer system may require obtaining a Special Approved Discharge (SAD) Permit. Contact City of Tacoma Source Control at 253-591-5588 for additional information on SAD permits.
- If runoff does not contain pollutants, following appropriate pretreatment, such as filtration or sedimentation, washwater may be allowed to be discharged to landscaping or the storm drainage system. This may require obtaining a Special Approved Discharge Permit. Contact the City of Tacoma Source Unit at 253-591-5588 for review and approval before commencing washing activities.

**Buildings:**

- Washwater from building washing shall be discharged to the sanitary sewer system with appropriate pretreatment to remove solids. Some ways of capturing the water can be by using tarps with berms, made by wrapping the tarp over pieces of lumber.
- If only cold water is used to remove dirt from a concrete or brick-sided building, this water may be allowed to fall onto a planted area or diverted to landscaping.

**Rooftop Equipment:**

- Washwater from cleaning rooftop equipment, such as exhaust fans and HVAC systems, shall be captured and disposed to the sanitary sewer. Wet/dry vacuums, temporary berms or containers may be used to capture this water.

**Parking Lots:**

- Wastewater generated from washing parking lots shall discharge to the sanitary sewer system. This water must have 50 mg/L or less of total petroleum hydrocarbons before it can be discharged to the sanitary sewer. This may require pretreatment.
- Alternatively, the water can be captured and hauled to a treatment, storage, and disposal facility for proper treatment and disposal.

**Sidewalks:**

- Sweep, shovel, or scrape up large debris and trash before washing.
- If soaps or other cleaning agents are used, the wastewater shall be captured and routed to the sanitary sewer if it meets the discharge requirements of Tacoma Municipal Code Chapter 12.08.
- If using only cold water, the water may be directed to landscaping or to the stormwater system with proper pretreatment. A sediment removal device shall be placed in the gutter line and the receiving catch basin before discharge. See Volume 2 for sediment removal BMPs.

**Graffiti:**

- Wastewater generated from graffiti removal shall be captured and discharged to the sanitary sewer system. Tarps and berms or wet/dry vacuums can be used to capture the washwater. This water must meet City of Tacoma limits per TMC 12.08 before discharge to the sanitary sewer.
- If removing graffiti with a cleaner only, apply sufficient cleaner to do the job. Small areas shall be wiped clean instead of using water for removal.

**4.2.4 Interior Washing Operations**

**Applicability:** This activity applies to businesses that wash floors, carpets, and other interior items on a mobile site-to-site basis. The washing process includes removing wax from floors and may use machines that spray a wash solution onto the carpet or upholstery and suck the dirty solution up into a portable tank with limited capacity.

Pollutants of concern consist of pH, nutrients, suspended solids, organic compounds (such as pesticides and chemicals used for flea and odor control), and biochemical oxygen demand (BOD).

**Required BMPs** for doing mobile interior wash activities:

- Wastewater shall be discharged to a sanitary sewer system at the site of collection. If sanitary sewer disposal is not available or not allowed where the wastewater was generated, the collected wastewater must be returned to the business site for proper treatment and disposal. Contact the local sewer authority for disposal regulations if the place of business is not located within the City of Tacoma.
- Absolutely no wastewater from mobile interior wash activities shall be disposed outdoors, or to a drain connected to the storm drainage system. This point must be made clear to all employees.
- Wastewater from mobile washing operations may be permitted for sanitary sewer disposal if it does not contain high concentrations of toxic materials. Some of the chemicals used for flea and odor control are listed by EPA as toxics. Contact City of Tacoma Source Control at 253-591-5588 if you intend to use and discharge these types of chemicals in your wastewater.
- Carpet cleaning washwater must be disposed to the sanitary sewer, preferably into a toilet or sink at the place where it was generated. Screen the wastewater to protect the customer's drain from plugging. Do not discharge this wastewater to a septic system.

**Recommended BMPs** for doing mobile interior wash activities:

- Limit the amount of water used in interior washing operations. This will save time, money, and effort for proper disposal.

#### **4.2.5 Washing, Pressure Washing and Steam Cleaning of Vehicles**

**Applicability:** This activity includes the washing of vehicles, aircraft, vessels/boats and grocery carts, by low or high pressure water or steam and includes hand washing, scrubbing, sanding, etc. This also includes "charity" car washes at gas stations, religious organizations, and commercial parking lots.

Pollutants of concern from cleaning activities include oil and grease, suspended solids, heavy metals, pH, soluble organics, soaps, and detergents.

**Required BMPs** for washing, pressure washing and steam cleaning vehicles:

**General:**

- Washwater shall be discharged to the sanitary sewer unless otherwise noted below.
- If heavy accumulations of solids are to be removed during washing, then appropriate pretreatment to capture those solids must be provided. Volume 2 contains temporary sediment removal BMPs that can be utilized to capture solids before discharging wastewater to the sanitary sewer system.
- Two-step (acid – alkaline) washing may be allowed at all facilities discharging to the sanitary sewer. Provisions must be in place to neutralize the washwater rinsate prior to discharge to the sanitary sewer system.
- See the City of Tacoma Source Control Policy on Discharges from Vehicle and other Washing Activities for additional information.
- Contact City of Tacoma Source Control at 253-591-5588 for more information.

***New and Used Car Dealer Lots:***

- If washing previously cleaned vehicles is accomplished using **only** cold water (no soaps or detergents used) and consists of washing only the outside of the motor vehicles, discharge to the stormwater system will be allowed and discharge to the sanitary system is prohibited.

- If soaps or detergents are to be used, washing must occur on a dedicated wash pad. Only washing of the outside of the vehicles is permitted unless additional pretreatment is provided

***Other Washing Events:***

- Identify types of washing events and their locations (such as the Tacoma Dome RV show, etc.) and evaluate options on a case-by-case basis according to the discharge criteria stated above.
- Charity car washes shall wash only the exterior of vehicles. If soap is used, the washwater must be captured and directed to the sanitary sewer. For information concerning the use of charity car wash kits, contact the City of Tacoma Community Relations EnviroChallenger staff at 253- 502-2220.

***Automatic and Manual Car Wash:***

- See the City of Tacoma Source Control Policy on Discharges from Vehicle and Other Washing Activities and Policy for Discharges to Sanitary Sewer for additional information.

***RV, Truck, Auto Detailing, and Engine Washing Facilities:***

- Wash on a dedicated pad. See the City of Tacoma Source Control Policy on Discharges from Vehicle and Other Washing Activities and Policy for Discharges to Sanitary Sewer for additional information.

***Boat Washing Facilities:***

- Wash on a dedicated pad. See the City of Tacoma Source Control Policy on Discharges from Vehicle and Other Washing Activities and Policy for Discharges to Sanitary Sewer for additional information.
- For cleaning activities while boats are in the water refer to the Washington State Department of Ecology publication 98-11, *Resource Manual for Pollution Prevention in Marinas*, available at: <http://www.ecy.wa.gov/biblio/9811.html>

***Mobile Vehicle Washers:*** This section applies to mobile vehicle and grocery cart washers doing work in the City of Tacoma. Detailed requirements and procedures may be found in The City of Tacoma Source Control Interim Policy for Mobile Vehicle Washers.

- Mobile vehicle washers shall capture all the washwater generated and discharge it to the sanitary sewer system through an on-site cleanout if available. The use of temporary wash pads, catch basin inserts, and vacuum systems are some possible means to capture the washwater. Other requirements may apply depending upon the items to be washed. Only wastewater generated within the City of Tacoma may be discharged into its municipal sewer system.



## 4.3 Transfer of Liquid or Solid Materials

### 4.3.1 BMP A201: Loading and Unloading Areas for Liquid or Solid Material

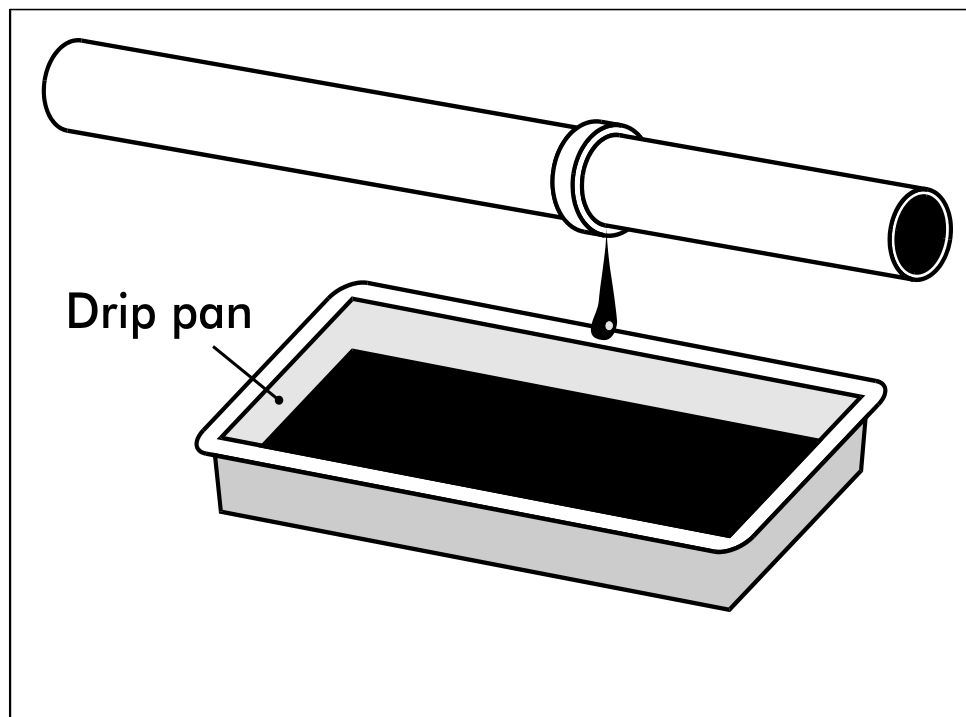
#### 4.3.1.1 Description of Pollutant Sources

Loading/unloading of liquid and solid materials at industrial and commercial facilities is typically conducted at shipping and receiving, outside storage, fueling areas, etc. Materials transferred can include products, raw materials, intermediate products, waste materials, fuels, scrap metals, etc. Leaks and spills of fuels, oils, powders, organics, heavy metals, salts, acids, alkalis, etc. during transfer are potential causes of stormwater contamination. Spills from hydraulic line breaks are a common problem at loading docks.

#### 4.3.1.2 Required BMPs

##### *At All Loading/ Unloading Areas:*

- Sweep loading/unloading areas frequently to remove accumulated material. Vacuum sweeping is also an acceptable method of removing accumulated material.
- Place drip pans or other appropriate temporary containment devices at locations where leaks or spills may occur such as hose connections, hose reels, and filler nozzles. Drip pans shall always be used when making and breaking connections (see Figure 4 - 1). Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed. Frequent monitoring of drip pans is required to ensure captured materials are not displaced by wind or rainwater.



**Figure 4 - 1. Drip Pan**

- Washing loading/unloading areas must be conducted in such a way that all the runoff is collected for proper disposal. Refer to BMP A103.
- Consistent with Uniform Fire Code requirements and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building or under a roof, lean-to, or other appropriate cover.
- Berm, dike, and/or slope the loading/unloading area to prevent run-on of stormwater and to prevent the runoff or loss of any spilled material from the area.
- Large loading areas frequently are not curbed along the shoreline. As a result, stormwater passes directly off the paved surface into surface water. Place curbs along the edge, or slope the edge such that the stormwater can flow to an internal storm drain system that leads to an approved treatment BMP.
- Pave and slope loading/unloading areas to prevent the pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they shall be placed in designated "alleyways" that are not covered by material, containers, or equipment.

***At Tanker Truck and Rail Transfer Areas to Above/Below-ground Storage Tanks:***

- To minimize the risk of accidental spillage, prepare an "Operations Plan" that describes procedures for loading/unloading. Train the employees in its execution and post it or otherwise have it readily available to employees.
- Report spills of reportable quantities to Ecology Southwest Regional Office (refer to Chapter 1 for telephone number).
- Prepare and implement an Emergency Spill Cleanup Plan for the facility (BMP A714 Spills of Oil and Hazardous Substances) which includes the following BMPs:
  - Ensure the clean up of liquid/solid spills in the loading/unloading area immediately if a significant spill occurs, upon completion of the loading/unloading activity, or at the end of the working day.
  - Retain and maintain an appropriate oil spill cleanup kit on-site for rapid cleanup of material spills (see BMP A714 Spills of Oil and Hazardous Substances).
  - Ensure that an employee trained in spill containment and cleanup is present during loading/unloading.

***At Rail Transfer Areas to Above/Below-ground Storage Tanks:***

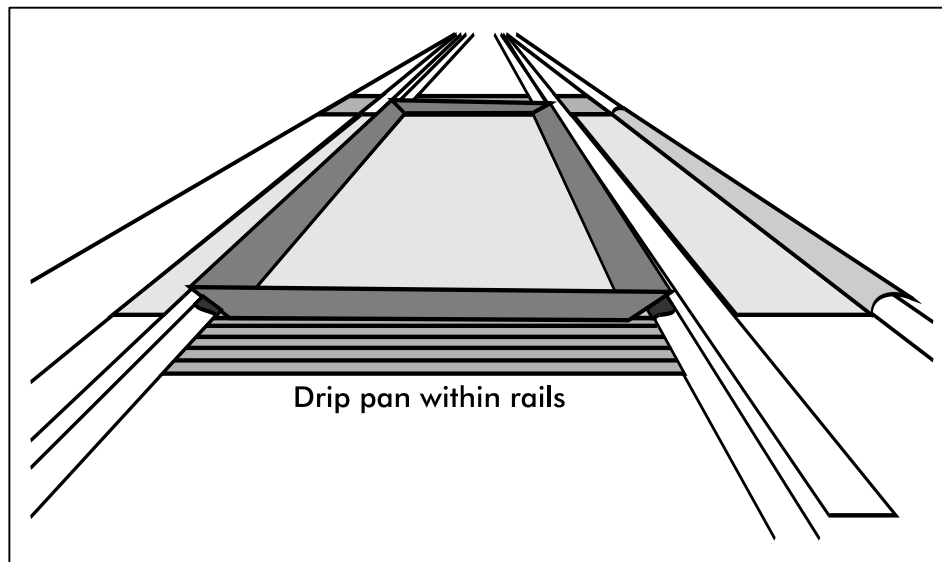
Install a drip pan system as illustrated (see Figure 4 - 2) within the rails to collect spills/leaks from tank cars and hose connections, hose reels, and filler nozzles.

***Loading/Unloading from/to Marine Vessels:***

Facilities and procedures for the loading or unloading of petroleum products must comply with Coast Guard requirements.

***Transfer of Small Quantities from Tanks and Containers:***

Refer to BMPs A408 Storage of Liquids in Permanent Above-Ground Tanks and A407 Storage of Liquid, Food Waste, or Dangerous Waste Containers for requirements on the transfer of small quantities from tanks and containers, respectively.



*Figure 4 - 2. Drip Pan Within Rails*

#### **4.3.1.3 Recommended BMPs:**

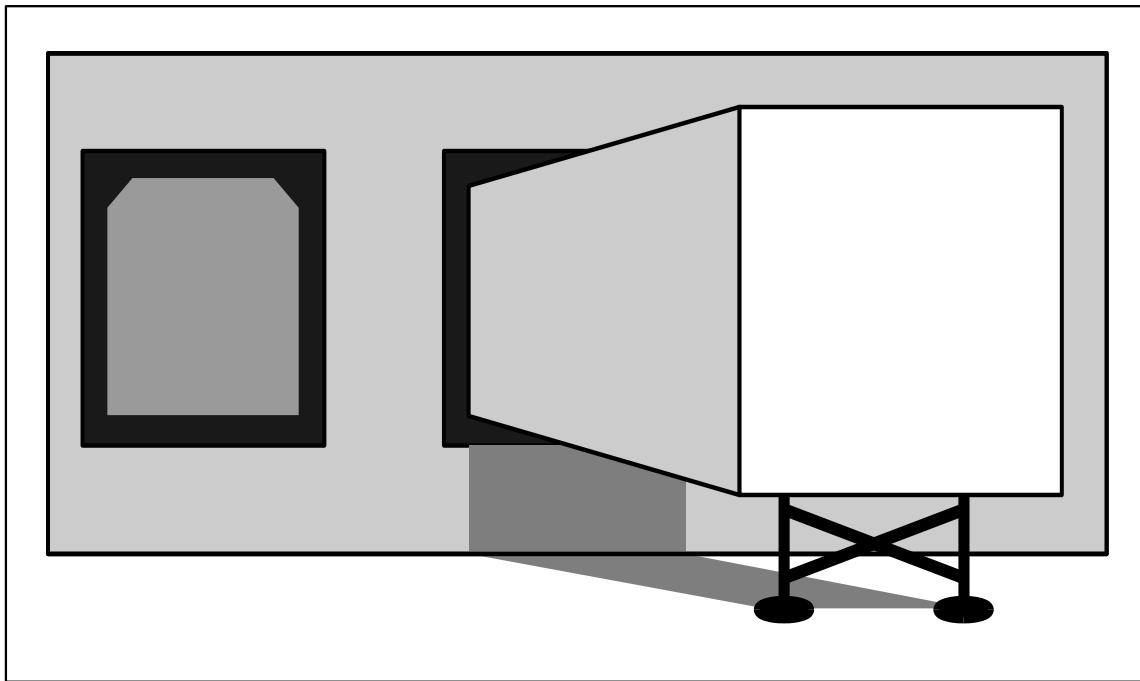
- Install an automatic shutoff system in the product transfer lines or other location that will minimize the release of product in the event of unanticipated off-loading interruption (e.g. coupling break, hose rupture, overfill, etc.).

#### ***At Loading and Unloading Docks:***

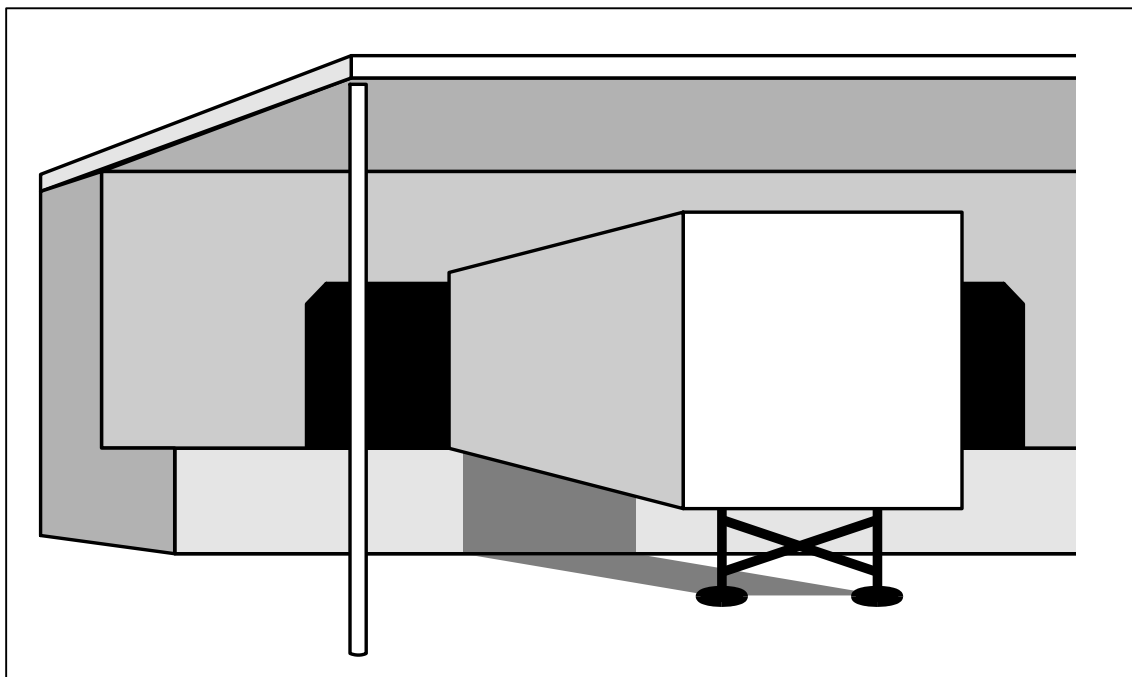
- Install/maintain overhangs or door skirts that enclose the trailer end (see Figure 4 - 3 and Figure 4 - 4) to prevent contact with rainwater.
- Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
- Retain on-site the necessary materials for rapid cleanup of spills.

#### ***At Tanker Truck Transfer Areas to Above/Below-Ground Storage Tanks:***

- Pave the area on which the transfer takes place. If any transferred liquid, such as gasoline, is reactive with asphalt, pave the area with Portland cement concrete.
- Slope, berm, or dike the transfer area to a dead-end sump, spill containment sump, spill control (SC) oil/water separator, or other spill control device. The minimum spill retention time should be 15 minutes at the highest fuel dispenser nozzle through-put rate or the peak flow rate of the 6-month, 24-hour storm event over the surface of the containment pad, whichever is greater. The volume of the spill containment sump should be a minimum of 50 gallons with an adequate grit sedimentation volume.



**Figure 4 - 3. Loading Dock with Door Skirt**



**Figure 4 - 4. Loading Dock with Overhang**

### **4.3.2 BMP A202: Fueling at Dedicated Stations**

#### **4.3.2.1 Description of Pollutant Sources**

A fueling station is a facility dedicated to the transfer of fuels from a stationary pumping station to mobile vehicles or equipment. It includes above or underground fuel storage facilities. In addition to general service gas stations, fueling may also occur at 24-hour convenience stores, construction sites, warehouses, car washes, manufacturing establishments, port facilities, and businesses with fleet vehicles. Typically, stormwater contamination at fueling stations is caused by leaks/spills of fuels, lube oils, radiator coolants, and vehicle washwater.

#### **4.3.2.2 Required BMPs**

##### ***General Requirements***

- Fuel islands shall not drain into the storm drainage system.
- Fuel islands may provide blind sumps for spill containment, or they may drain into the sanitary sewer through a properly sized oil/water separator.
- Follow the City of Tacoma Source Control Oil Water Separator policy available at [www.cityoftacoma.org/stormwater](http://www.cityoftacoma.org/stormwater). The policy provides guidance for both covered and uncovered fuel islands.

### **4.3.3 BMP A203: Vehicle Maintenance Activities**

#### **4.3.3.1 Description of Pollutant Sources**

This activity applies to businesses and public agencies where fuel filters, engine oil, and other fluids such as battery acid, coolants, and transmission and brake fluids are removed and replaced in vehicles and equipment. It also applies to mobile vehicle maintenance operations, such as at construction sites. Related vehicle maintenance activities are covered under the following activity headings in this manual, and other BMPs provided in this manual:

- A103 Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures
- A201 Loading and Unloading Areas for Liquid or Solid Material
- A202 Fueling at Dedicated Stations
- A204 Mobile Fueling
- A307 Painting, Finishing and Coating of Vehicles, Boats, Buildings, and Equipment
- A401 Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products
- A407 Storage of Liquid, Food Waste, or Dangerous Waste Containers
- A408 Storage of Liquids in Permanent Above-ground Tanks
- A409 Parking and Storage for Vehicles and Equipment
- A714 Spills of Oil and Hazardous Substances

Pollutants of concern include toxic hydrocarbons, toxic organic compounds, oils and greases, pH, and heavy metals.

#### **4.3.3.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses and agencies engaged in engine and vehicle repair:

- Employees must be educated about the need for careful handling of automotive fluids. Employees at businesses or agencies who routinely change or handle these fluids must be trained in spill response and cleanup procedures. Inspect all incoming vehicles, parts, and equipment stored temporarily outside for leaks.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
- Empty fuel and fuel filters before disposal.
- Spill cleanup materials, such as rags and absorbent materials, must always be kept close at hand when changing oil and other fluids. Soiled rags and other cleanup material must be properly disposed of or cleaned and reused.
- Floor drains inside buildings shall connect to sanitary sewer, be routed through an appropriately sized oil/water separator and shall be approved by the City.

- Do not hose down the maintenance/repair area. Instead, sweep the area weekly to collect dirt, and wipe up spills with rags and other absorbent materials.
- A bermed tarp, ground cloth, or drip pans must be used beneath the vehicle or equipment to capture all spills and drips. The collected drips and spills must be recycled or disposed of properly. See BMP S102 for disposal options.
- If this activity occurs at a stationary business location, the activity area must be moved indoors. An exception to this requirement would be equipment that is too large to fit under a roofed area. In this case, the outdoor area must be paved, provided with a sump drain, and provision made for stormwater runoff prevention. See BMP S106 and S107 for more on paving, sump drains and holding tanks, and runoff prevention. Contact the City of Tacoma Sanitary Source Control unit at 253-591-5588 for information on requirements for disposal to sewer. If the site utilizes a septic tank, sump contents will need to be pumped and disposed of by an oil recycler or hazardous waste company.
- Recycle oil, antifreeze, batteries, and air conditioning coolant.
- If engine washing is to be performed, then appropriate pretreatment will be required. Contact the City of Tacoma Source Control Unit at 253-591-5588 for their requirements.

#### **4.3.3.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution prevention.

- Drain all fluids from wrecked vehicles and car parts upon arrival. Recover air conditioning gases.
- Use reusable cloth rags to clean up drips and small spills instead of disposables: these can be professionally laundered and reused. Do not attempt to launder these at home or at a coin-op laundry.
- Use absorbent pillows or booms in or around storm drains and catch basins to absorb oil and fuel.
- Maintain vehicles under cover where possible.

### **4.3.4 BMP A204: Mobile Fueling of Vehicles and Heavy Equipment**

#### **4.3.4.1 Description of Pollutant Sources**

Mobile fueling, also known as fleet fueling, wet fueling, or wet hosing, is the practice of filling fuel tanks of vehicles by tank trucks that are driven to the yards or sites where the vehicles to be fueled are located. Mobile fueling is only conducted using diesel fuel, as mobile fueling of gasoline is prohibited. Diesel fuel is considered a Class II Combustible Liquid, whereas gasoline is considered a Flammable Liquid.

Historically mobile fueling has been conducted for off-road vehicles that are operated for extended periods of time in remote areas. This includes construction sites, logging operations, and farms. Mobile fueling of on-road vehicles is also conducted commercially in the State of Washington.

#### **4.3.4.2 Required BMPs**

Organizations and individuals conducting mobile fueling operations must implement the following BMPs. The operating procedures for the driver/operator shall be simple, clear, effective and their implementation verified by the organization that will potentially be liable for environmental and third party damage.

- Ensure that all mobile fueling operations are approved and permitted by Tacoma Fire Prevention Bureau and comply with local and Washington State fire codes. Contact the Tacoma Fire Prevention Bureau at 253-591-5740 to obtain the annual permit.
- Fueling locations that are in close proximity to sensitive aquifers, designated wetlands, wetland buffers, or other waters of the State, require approval by the City of Tacoma to ensure compliance with additional local requirements. Ensure compliance with TMC 3.10.
- Ensure compliance with all 49 CFR 178 requirements for DOT 406 cargo tanker. Documentation from a Department of Transportation (DOT) Registered Inspector shall be proof of compliance.
- Ensure the presence and the constant observation/monitoring by the driver/operator at the fuel transfer location at all times during fuel transfer and ensure that the following procedures are implemented at the fuel transfer locations:
  - Locate the point of fueling at least 25 feet from the nearest storm drain or inside an impervious containment area with a volumetric holding capacity equal to or greater than 110 percent of the receiving tank volume, or place an impervious covering over the storm drain to ensure no inflow of spilled or leaked fuel. Storm drains that convey the inflow to a spill control separator approved by the City of Tacoma, including the Tacoma Fire Department, need not be covered. Potential spill/leak conveyance surfaces must be impervious and in good repair.
  - Place a drip pan or an absorbent pad under each fueling location prior to and during all dispensing operations. The pan (must be liquid tight) and the absorbent pad must have a capacity of 3 gallons. Spills retained in the drip pan or the pad need not be reported.
  - Handle and operate fuel transfer hoses and nozzle, drip pan(s), and absorbent pads to prevent spills/leaks of fuel from reaching the ground, storm drains, and receiving waters.
  - Do not extend the fueling hoses across a traffic lane without fluorescent traffic cones, or equivalent devices.



- Remove the fill nozzle and cease filling when the automatic shut-off valve engages. Do not allow automatic shutoff fueling nozzles to be locked in the open position.
- Do not “top off” the equipment receiving fuel.
- Provide the driver/operator of the fueling vehicle with:
  - Adequate headlamps, flashlights or other mobile lighting to view fill openings with poor accessibility. Consult with the Tacoma Fire Department for additional lighting requirements.
  - Two-way communication with home base.
- Train the driver/operator annually in spill prevention, reporting and cleanup measures and emergency procedures. Make all employees aware of the significant liability associated with fuel spills.
- The fueling operation procedures shall be properly signed and dated by the responsible manager, distributed to the operators, retained in the organization files, and made available in the event an authorized government agency requests a review.
- Ensure that the Tacoma Fire Department (911) and the Ecology Southwest Regional Office are immediately notified in the event of any spill entering surface or groundwaters, including catch basins. Establish a 24-hour “call down list” to ensure the rapid and proper notification of management and government officials should any amount of product be spilled on-site. Keep the list in a protected but readily accessible location in the mobile fueling truck. The “call down list” shall also pre-identify spill response contractors available in the area to ensure the rapid removal of significant product spillage into the environment.
- Maintain a minimum of the following spill clean-up materials in all fueling vehicles, that are readily available for use:
  - Non-water absorbents (pads, pillows, sump skimmers) capable of absorbing 15 gallons of diesel fuel;
  - A storm drain plug or cover kit;
  - A non-water absorbent containment boom of a minimum 10 feet in length with a 12-gallon absorbent capacity;
  - A non-metallic shovel; and
  - Two, five-gallon buckets with lids.
  - Loose granular absorbent material capable of absorbing a minimum of 5 gallons of diesel. Use only non-water absorbing materials, such as peat moss, during wet weather conditions.
- Use automatic shutoff nozzles for dispensing the fuel. Replace automatic shut-off nozzles as recommended by the manufacturer.
- Maintain and replace equipment on fueling vehicles, particularly hoses and nozzles, at established intervals to prevent failures.
- Do not overfill tanks. Allow room for heat expansion of fuel during warm weather.
- Include the following fuel transfer site components:
  - Automatic fuel transfer shut-off nozzles; and
  - An adequate lighting system at the filling point.

## **4.4 Production and Application Activities**

### **4.4.1 BMP A301: Concrete and Asphalt Mixing and Production at Stationary Sites**

#### **4.4.1.1 Description of Pollutant Sources**

This activity applies to businesses and agencies that mix raw materials onsite to produce concrete or asphalt. It also applies to subsequent uses such as pouring concrete structures and making other concrete or asphalt products. Mobile concrete pouring and asphalt application are covered under BMP A302. Requirements for stockpiling of raw materials are covered under BMP A401 Storage or Transfer (Outside) of Solid Raw Materials, By-products or Finished Products.

Pollutants of concern include toxic hydrocarbons, toxic organic compounds, oils and greases, heavy metals, and pH.

#### **4.4.1.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses and public agencies active in concrete and asphalt mixing and production:

- Eliminate all illicit connections to the storm drainage system. See BMP S101 for a detailed discussion on identifying and eliminating these connections.
- All process water from production, pouring, and equipment cleaning must be discharged to a dead-end sump, a process water treatment system, connected to the sanitary sewer, or recycled. Never wash fresh concrete or concrete mixer washout into streets, storm drainage systems, streams, or other water bodies.
- A BMP maintenance schedule must be established, maintenance documented, and employees educated about the need to prevent stormwater contamination through the use and proper maintenance of BMPs.
- Production and pouring areas must be protected from stormwater run-on. See BMP S107 for methods of run-on protection.
- Cover the production area for prevention of stormwater run-on. See BMP S104 and S107 for information on covers and run-on prevention.
- Use absorbent materials or catch basin filters in and around storm drains and catch basins to filter out contaminants.
- Contact the Washington State Department of Ecology at 360-407-6400 to determine if an NPDES Sand and Gravel General Permit is required for your site.
- Sweep areas that show accumulation of materials. Vacuum sweeping is also an acceptable method of removing accumulated material.

#### **4.4.1.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution protection:

- The production and pouring area should be swept at the end of each work day to collect loose chunks of aggregate and raw materials for recycling or proper disposal. See BMP S102 for disposal options.
- Asphalt plants should use an oil/water separator to treat stormwater runoff. See Volume 5, Water Quality Treatment BMPs, for more information.
- Pave the mixing, production, and pouring areas. A sump drain in these areas is probably not advisable due to potential clogging problems, but could be used in a curing area. Sweep these areas to remove loose aggregate and recycle or dispose of properly.

#### **4.4.2 BMP A302: Concrete Pouring, Concrete Cutting, and Asphalt Application at Temporary Sites**

##### **4.4.2.1 Description of Pollutant Sources**

This activity applies to businesses and public agencies that apply asphalt or pour or cut concrete for building construction and remodeling, road construction, utility projects, sidewalk, curb and gutter repairs and construction, sealing of driveways and roofs, and other applications. These activities are typically done on a temporary site-to-site basis where permanent BMP measures do not apply. Concrete pouring activities can not only severely alter the pH of receiving waters, but slurry from aggregate washing can harden in storm pipes, thus reducing capacity and creating flooding problems.

Pollutants of concern include toxic hydrocarbons, toxic organic compounds, oils and greases, heavy metals, suspended solids, and pH.

##### **4.4.2.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses and agencies doing concrete pouring and asphalt application at temporary sites:

- Employees must be educated on the pollution hazards of concrete and asphalt application and cutting.
- Loose aggregate chunks and dust must be swept or shoveled and collected (not hosed down a storm drain) for recycling or proper disposal at the end of each work day, especially at work sites such as streets, driveways, parking lots, sidewalks, curbs, and gutters where rain can readily pick up the loose material and carry it to the nearest stormwater conveyance system. Small amounts of excess concrete, grout, and mortar can be disposed of in the trash.
- Storm drain covers or similarly effective containment devices must be placed over all nearby drains at the beginning of each day. Shovel or vacuum slurry and remove from the site. All accumulated runoff and solids must be collected and properly disposed (see BMP S102 for disposal options) at the end of each work day, or more often if necessary.
- Exposed aggregate washing, where the top layer of unhardened concrete is hosed or scraped off to leave a rough finish, must be done with a mechanism for containment and collection of the discarded concrete slurry (such as the storm drain covers mentioned above). The easiest way to contain the washwater is to direct the washings to a trench in the ground where the water can percolate into the ground and the solids later covered with soil.
- Cleaning of concrete application and mixing equipment or concrete vehicles on the work site must be done in a designated area where the rinse water is controlled. The rinse water must either be collected for proper disposal or put into a trench in the ground where the water can percolate away and the solids later covered with soil or recovered and disposed or recycled.
- Comply with the following BMPs in Volume 2 as applicable:
  - BMP C151: Concrete Handling
  - BMP C152: Sawcutting and Surface Pollution Prevention
  - BMP C154: Concrete Washout Area

The use of any treatment BMP must not result in the violation of groundwater, surface water, or drinking water quality standards.

#### **4.4.2.3 Recommended BMPs**

The following BMPs are not required but can provide additional pollution prevention:

- Avoid the activity when rain is occurring or expected.
- If possible, portable asphalt mixing equipment should be covered by an awning, a lean-to, or another simple structure to avoid contact with rain. See BMP S104 for further details on cover structures.
- Recycle broken concrete and asphalt. Look under Recycling Services in the Yellow pages of the phone book to find the nearest recycler.

### **4.4.3 BMP A303: Manufacturing and Post-Processing of Metal Products**

#### **4.4.3.1 Description of Pollutant Sources**

This activity applies to businesses such as mills, foundries, and fabricators that manufacture or post-process metal products. A variety of activities such as machining, grinding, soldering, cutting, welding, quenching, cooling, and rinsing may take place. These businesses may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Ecology or an Industrial Wastewater Discharge Permit from the City of Tacoma.

- Contact the Washington State Department of Ecology at 360-407-7541 for questions related to NPDES Industrial Stormwater Permitting.
- Contact the City of Tacoma Source Control at 253-591-5588 to determine if a City of Tacoma Industrial Wastewater Discharge Permit is necessary.

**NOTE:** Painting, finishing and coating of metal products is covered under BMP A307 Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment.

Pollutants of concern include toxic organic compounds, heavy metals, oils and greases, pH, suspended solids, and biological oxygen demand (BOD).

#### **4.4.3.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses engaged in metals manufacturing or post-processing:

- Eliminate illicit connections to the storm drainage system. See BMP S101 for detailed information on identifying and eliminating illicit connections.
- Process wastewater (including contact cooling water, filter backwash, cooling tower blowdown, etc.), and stormwater runoff from activity areas, must discharge to a sanitary sewer, holding tank, or process treatment system before discharge to surface water or storm drain. Contact the City of Tacoma Source Control at 253-591-5588 to obtain permits for discharge to the sewer. See BMP S103 for detailed requirements.
- Employees must be educated to control their work with metal products to minimize pollution.
- The activity area must be swept at the end of each work day to collect and dispose of metal fragments and product residues properly. See BMP S102 for disposal alternatives.

#### **4.4.3.3 Recommended BMPs**

The following BMPs are not required but can provide additional pollution protection:

- Limit the amount of water used in quenching and rinsing. Recycle used water where possible.
- Cover the activity area to prevent rain from contacting the process and reduce the amount of runoff that has to be detained or treated.
- Use a catch basin filter or screen basket insert to capture stray metal particles.
- Implement a program to track purchase and consumption of lubricants, solvents, and additives. Check with operating managers for an explanation if consumption increases. Recommend actions if significant equipment leaks or spills are identified.
- Utilize any additional BMPs which are applicable for materials storage and maintenance activities in your shop.

#### **4.4.4 BMP A304: Wood Treatment Areas**

##### **4.4.4.1 Description of Pollutant Sources**

Wood treatment includes both anti-staining and wood preserving using pressure processes or by dipping or spraying. Wood preservatives and anti-staining chemical additives can include petroleum products, pesticides and heavy metals.

Pollutant sources include drips of condensate or preservative after pressurized treatment, product washwater (in the treatment or storage areas), spills and leaks from process equipment and preservative tanks, fugitive emissions from vapors in the process, blowouts and emergency pressure releases, and kick-back from lumber (phenomenon where preservative leaks as it returns to normal pressure). Potential pollutants typically include the wood treating chemicals, BOD, suspended solids, oil and grease, benzene, toluene, ethylbenzene, phenol, chlorophenols, nitrophenols, heavy metals, and PAH, depending on the chemical additive used.

##### **4.4.4.2 Required BMPs**

All wood treating facilities in Washington State are required to be covered under an Individual NPDES Permit and may require an Industrial Wastewater Discharge Permit from the City of Tacoma. The individual NPDES Permit will describe the BMPs applicable to the site.

#### **4.4.5 BMP A305: Commercial Composting**

##### **4.4.5.1 Description of Pollutant Sources**

Commercial compost facilities operating outside without cover require large areas to decompose wastes and other feedstocks. These facilities should be designed to separate stormwater from leachate (i.e., industrial wastewater) to the greatest extent possible. When stormwater is allowed to contact any active composting areas, including waste receiving and processing areas, it becomes leachate. Pollutants in leachate include nutrients, biochemical oxygen demand (BOD), organics, coliform bacteria, acidic pH, color, and suspended solids. Stormwater at a compost facility consists of runoff from areas at the facility that are not associated with active processing and curing, such as product storage areas, vehicle maintenance areas, and access roads.

##### **4.4.5.2 Required BMPs**

Commercial composting facilities are required to be covered under an Individual NPDES Permit and may require an Industrial Wastewater Discharge Permit from the City of Tacoma.

- Ensure that the compost feedstocks do not contain dangerous wastes regulated under Chapter 173-303 WAC or hazardous products of a similar nature or solid wastes that are not beneficial to the composting process. Employees must be trained to screen these materials in incoming wastes.
- Develop a plan of operations as outlined in the Composting Facility Standards (WAC 173-350-220) and in the Individual NPDES Permit.



#### **4.4.6 BMP A306: Landscaping and Lawn/Vegetation Management**

##### **4.4.6.1 Description of Pollutant Sources**

Landscaping can include grading, soil transfer, vegetation removal, pesticide and fertilizer application, and watering. Stormwater contaminants include toxic organic compounds, heavy metals, oils, total suspended solids, coliform bacteria, fertilizers, and pesticides.

Lawn and vegetation management can include control of objectionable weeds, insects, mold, bacteria, and other pests with chemical pesticides and is conducted commercially at commercial, industrial, and residential sites. Examples include weed control on golf course lawns, access roads, and utility corridors and during landscaping; sap stain and insect control on lumber and logs; rooftop moss removal; killing nuisance rodents; fungicide application to patio decks; and residential lawn/plant care. Toxic pesticides such as pentachlorophenol, carbamates, and organometallics can be released to the environment by leaching and dripping from treated parts, container leaks, product misuse, and outside storage of pesticide contaminated materials and equipment. Poor management of the vegetation, poor application of pesticides or fertilizers, and non-targeted irrigation water or overwatering can cause appreciable stormwater contamination.

##### **4.4.6.2 Required BMPs for Landscaping**

- Install engineered soil/landscape systems to improve the infiltration and regulation of stormwater in landscaped areas. Apply Soil Quality and Depth BMPs as required per Minimum Requirement #5.
- Do not dispose of collected vegetation into wetlands, waterways or storm drainage systems.

##### **4.4.6.3 Recommended BMPs for Landscaping**

- Conduct mulch-mowing whenever practicable.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation by composting, if feasible.
- Collect all clippings, leaves, bark, and trimmings blown onto the sidewalk or street. Don't leave this material in the gutter or where it can be washed into the storm drainage system.
- Use mulch or other erosion control measures when soils are exposed for more than one week during the dry season or two days during the rainy season.
- If oil or other chemicals are handled, store and maintain appropriate oil and chemical spill cleanup materials in readily accessible locations. Ensure that employees are familiar with proper spill cleanup procedures.
- Till fertilizers into the soil rather than dumping or broadcasting onto the surface. Determine the proper fertilizer application for the types of soil and vegetation encountered.
- Till a topsoil mix or composted organic material into the soil to create a well-mixed transition layer that encourages deeper root systems and drought-resistant plants.
- Use manual and/or mechanical methods of vegetation removal rather than applying herbicides, where practical.
- Target irrigation water on vegetated areas and limit irrigation time to reduce the potential of carrying fertilizers and pesticides off-site.

#### **4.4.6.4 Required BMPs for the Use of Pesticides**

- Develop and implement an integrated pest management system (IPM) (See BMP S108) and use pesticides only as a last resort.
- Implement a pesticide-use plan and include at a minimum: a list of selected pesticides and their specific uses; brands, formulations, application methods, and quantities to be used; equipment use and maintenance procedures; safety, storage, and disposal methods; and monitoring, record keeping, and public notice procedures. All procedures shall conform to the requirements of Chapter 17.21 RCW and Chapter 16-228 WAC (Appendix 4 – D.R.7).
- Choose the least toxic pesticide available that is capable of reducing the infestation to acceptable levels. The pesticide should readily degrade in the environment and/or have properties that strongly bind it to the soil. Any pest control used should be conducted at the life stage when the pest is most vulnerable. Any method used should be site-specific and not used wholesale over a wide area.
- Apply the pesticide according to label directions. Under no conditions shall pesticides be applied in quantities that exceed manufacturer's instructions.
- Mix the pesticides and clean the application equipment in an area where accidental spills will not enter surface or groundwaters, and will not contaminate the soil.
- Store pesticides in enclosed areas or in covered impervious containment. Ensure that pesticide contaminated stormwater or spills/leaks of pesticides are not discharged to storm drains. Do not hose down paved areas to a storm drain or conveyance ditch. Store and maintain appropriate spill cleanup materials in a location known to all near the storage area.
- Clean up any spilled pesticides and ensure that the pesticide contaminated waste materials are kept in designated covered and contained areas.
- The pesticide application equipment must be capable of immediate shutoff in the event of an emergency.
- Do not spray pesticides within 100 feet of open waters including wetlands; ponds; and streams, sloughs, and any drainage ditch or channel that leads to open water, except when approved by Ecology or by the City of Tacoma. All sensitive areas including wells, creeks, and wetlands must be flagged prior to spraying.
- As required by the City of Tacoma or by Ecology, complete public posting of the area to be sprayed prior to the application.
- Spray applications should only be conducted during weather conditions as specified in the label direction and applicable local and state regulations. Do not apply during rain or immediately before expected rain.
- Pesticides shall not be applied to stormwater management facilities.

#### **4.4.6.5 Recommended BMPs for the use of Pesticides**

- Consider alternatives to the use of pesticides such as covering or harvesting weeds, substitute vegetative growth, and manual weed control/moss removal.
- Consider the use of soil amendments, such as compost, that are known to control some common diseases in plants, such as Pythium root rot, ashy stem blight, and parasitic nematodes. The following are three possible mechanisms for disease control by compost addition (USEPA Publication 530-F-9-044):
  - Successful competition for nutrients by antibiotic production;

- Successful predation against pathogens by beneficial microorganism; and
- Activation of disease-resistant genes in plants by composts.

Installing an amended soil/landscape system can preserve both the plant system and the soil system more effectively. This type of approach provides a soil/landscape system with adequate depth, permeability, and organic matter to sustain itself and continue working as an effective stormwater infiltration system and a sustainable nutrient cycle.

- Once a pesticide is applied, its effectiveness should be evaluated for possible improvement. Records should be kept showing the applicability and inapplicability of the pesticides considered.
- An annual evaluation procedure should be developed including a review of the effectiveness of pesticide applications, impact on buffers and sensitive areas (including potable wells), public concerns, and recent toxicological information on pesticides used/proposed for use. If individual or public potable wells are located in the proximity of commercial pesticide applications, contact the regional Ecology hydrologist to determine if additional pesticide application control measures are necessary.
- Rinsate from equipment cleaning and/or triple-rinsing of pesticide containers should be used as product or recycled into product.

For more information, contact the WSU Extension Home-Assist Program at 253-445-4500; Bio-Integral Resource Center (BIRC), P.O. Box 7414, Berkeley, CA 94707; or the Washington Department of Ecology to obtain “Hazardous Waste Pesticides” (Publication #89-41); contact EPA to obtain a publication entitled “Suspended, Canceled and Restricted Pesticides” which lists all restricted pesticides and the specific uses that are allowed. Valuable information from these sources may also be available on the internet.

#### **4.4.6.6 Required BMPs for Vegetation Management**

- Use at least an eight-inch topsoil layer with at least 8 percent organic matter to provide a sufficient vegetation-growing medium.
- Select the appropriate turf grass mixture for climate and soil type based on recommendations from a licensed landscape architect.
- Selection of desired plant species can be made by adjusting the soil properties of the subject site. For example, a constructed wetland can be designed to resist the invasion of reed canary grass by layering specific strata of organic matters (e.g., compost forest product residuals) and creating a mildly acidic pH and carbon-rich soil medium. Consult a soil restoration specialist for site-specific conditions.
- Aerate lawns regularly in areas of heavy use, where the soil tends to become compacted. Aeration shall be conducted while the grasses in the lawn are growing most vigorously. Remove layers of thatch greater than ¾-inch deep.
- Set the mowing height at the highest acceptable level and mow at times and intervals designed to minimize stress on the turf. Generally mowing only 1/3 of the grass blade height will prevent stressing the turf.

**4.4.6.7 Required BMPs for the Use of Fertilizers**

- Fertilization needs vary by site depending on plant, soil, and climatic conditions. Evaluation of soil nutrient levels through regular testing ensures the best possible efficiency and economy of fertilization. For details on soils testing, contact the Pierce Conservation District or Cooperative Extension Service.
- Fertilizers shall be applied in amounts appropriate for the target vegetation and at the time of year that minimizes losses to surface and groundwaters. Do not fertilize during a drought or when the soil is dry. Alternatively, do not apply fertilizers within three days prior to predicted rainfall. The longer the period between fertilizer application and either rainfall or irrigation, the less fertilizer runoff occurs.
- Use slow release fertilizers such as methylene urea, IDBU, or resin coated fertilizers when appropriate, generally in the spring. Use of slow release fertilizers is especially important in areas with sandy or gravelly soils.
- Time the fertilizer application to periods of maximum plant uptake. Generally fall and spring applications are recommended.
- Properly trained persons shall apply all fertilizers. Fertilizers shall not be applied to grass swales, filter strips, or buffer areas that drain to surface water bodies.
- Fertilizers shall not be applied to stormwater management facilities.

#### **4.4.7 BMP A307: Painting, Finishing and Coating of Vehicles, Boats, Buildings and Equipment**

##### **4.4.7.1 Description of Pollutant Sources**

Surface preparation and the application of paints, finishes, and/or coatings to vehicles, boats, buildings, and/or equipment outdoors can be sources of pollutants. Potential pollutants include organic compounds, oils and greases, heavy metals, and suspended solids.

##### **4.4.7.2 Required BMPs**

- Train employees in the careful application of paints, finishes, and coatings to reduce misuse and over spray. Use ground or drop cloths or temporary berms underneath outdoor painting, scraping, sandblasting work, and properly clean and temporarily store collected debris daily.
- Do not conduct spraying, blasting, or sanding activities over open water or where wind may blow paint into water.
- Wipe up spills with rags and other absorbent materials immediately. Do not hose down the area to a storm drain, receiving water, or conveyance ditch to receiving water.
- On marine dock areas, sweep or vacuum rather than hose down debris. Collect any hose water generated and convey to appropriate treatment and disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control device if dust, grit, washwater, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the workday. Collect contaminated runoff and solids and properly dispose of such wastes before removing the containment device(s) at the end of the workday.
- Use a ground cloth, pail, drum, drip pan, tarpaulin, or other protective device (e.g. plastic wading pool) for activities such as paint mixing and tool cleaning outside or where spills can contaminate stormwater.
- Properly dispose of all wastes and prevent all uncontrolled releases to the air, ground, or water.
- Clean brushes and tools covered with non-water-based paints, finishes, or other materials in a manner that allows collection of used solvents (e.g., paint thinner, turpentine, xylol, etc.) for recycling or proper disposal.
- Store toxic materials under cover (tarp, etc.) during precipitation events and when not in use to prevent contact with stormwater.
- Enclose and/or contain all work while using a spray gun or conducting sand blasting and in compliance with applicable air pollution control, OSHA, and WISHA requirements. Do not conduct outside spraying, grit blasting, or sanding activities during windy conditions which render containment ineffective.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain.

##### **4.4.7.3 Recommended BMPs**

- Recycle paint, paint thinner, solvents, pressure washer water, and any other recyclable materials.
- Use efficient spray equipment such as electrostatic, air-atomized, high volume/low pressure, or gravity feed spray equipment.
- Purchase recycled paints, paint thinner, solvents, and other products if feasible.

#### **4.4.8 BMP A308: Commercial Printing Operations**

##### **4.4.8.1 Description of Pollutant Sources**

Materials used in the printing process include inorganic and organic acids, resins, solvents, polyester film, developers, alcohol, vinyl lacquer, dyes, acetates, and polymers. Waste products may include waste inks and ink sludge, resins, photographic chemicals, solvents, acid and alkaline solutions, chlorides, chromium, zinc, lead, spent formaldehyde, silver, plasticizers, and used lubricating oils. As the printing operations are conducted indoors, the only likely points of potential contact with stormwater are the outside temporary waste material storage area and area where chemicals are offloaded at external unloading bays. Pollutants can include TSS, pH, heavy metals, oil and grease, and COD.

##### **4.4.8.2 Required BMPs**

- Discharge process wastewaters to a sanitary sewer (if approved by the City of Tacoma) or to an approved process wastewater treatment system. Contact the City of Tacoma Source Control Unit at 253-591-5588 for discharge requirements.
- Do not discharge process wastes or wastewaters into storm drains or surface water.
- Determine whether any of these wastes qualify for regulation as dangerous wastes and dispose of them accordingly.
- Store raw materials or waste materials that could contaminate stormwater in covered and contained areas.
- Train all employees in pollution prevention, spill response, spill reporting, and environmentally acceptable materials handling procedures.
- Store materials in proper, appropriately labeled containers. Identify and label all chemical substances.

##### **4.4.8.3 Recommended BMPs**

- Use press washes without listed solvents, and with the lowest VOC content possible. Don't evaporate ink cleanup trays to the outside atmosphere.
- Place cleanup sludges into a properly labeled container with a tight lid, designate the sludge, and dispose properly. It is the responsibility of the generator to designate waste as hazardous waste and provide supporting information.

For additional information on pollution prevention the following Washington Department of Ecology publications are recommended: [A Guide for Screen Printers](#), Publication #94-137 and [A Guide for Lithographic Printers](#), Publication #94-139.

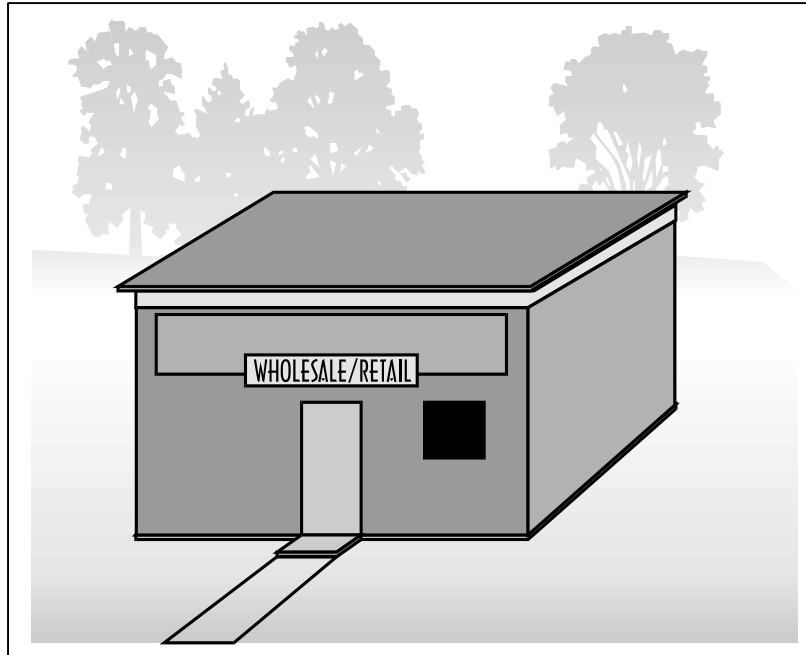
## **4.4.9 BMP A309: Manufacturing Operations – Outside**

### **4.4.9.1 Description of Pollutant Sources**

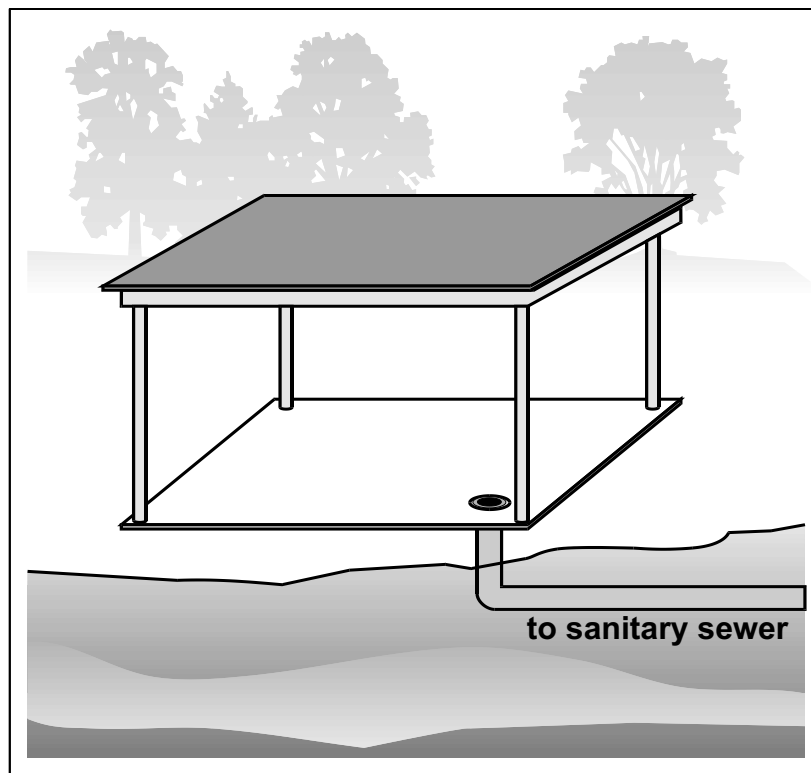
Manufacturing pollutant sources include outside process areas, stack emissions, and areas where manufacturing activity has taken place in the past and significant pollutant materials remain and are exposed to stormwater.

### **4.4.9.2 Required BMPs**

- Sweep paved areas regularly, as needed, to prevent contamination of stormwater. Vacuum sweeping is preferred.
- Alter the activity by eliminating or minimizing the contamination of stormwater.
- Enclose the activity (see Figure 4 - 5). If possible, enclose the manufacturing activity in a building.
- Cover the activity and connect floor drains to a sanitary sewer, if approved by the City of Tacoma. Berm or slope the floor as needed to prevent drainage of pollutants to outside areas (see Figure 4 - 6).
- Isolate and segregate pollutants, as feasible. Convey the segregated pollutants to a sanitary sewer, process treatment, or dead-end sump, depending on available methods and applicable permit requirements.



**Figure 4 - 5. Enclose the Activity**



**Figure 4 - 6. Cover the Activity**



## **4.5 Storage and Stockpiling Activities**

### **4.5.1 BMP A401: Storage or Transfer (Outside) of Solid Raw Materials, By-Products or Finished Products**

#### **4.5.1.1 Description of Pollutant Sources**

Solid raw materials, by-products, or products such as gravel, sand, salts, topsoil, compost, logs, sawdust, wood chips, lumber and other building materials, concrete, and metal products are typically stored outside in large piles, stacks, etc. at commercial or industrial establishments. Contact of outside bulk materials with stormwater can cause leachate and/or erosion of the stored materials. Contaminants may include TSS, BOD, organics, and dissolved salts (sodium, calcium, magnesium chloride, etc.).

#### **4.5.1.2 Required BMPs**

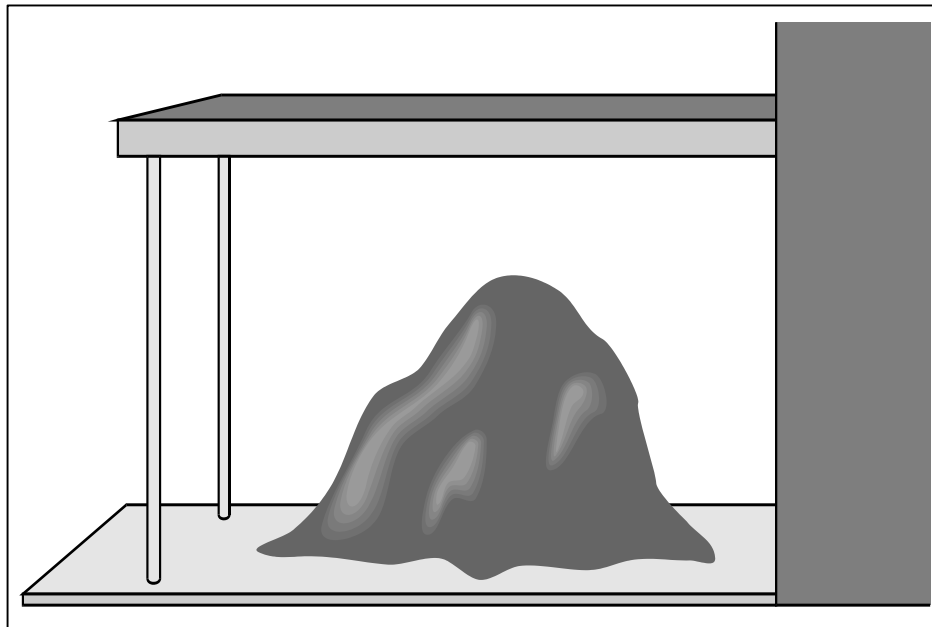
- Do not hose down the contained stockpile area to a storm drain or other conveyance leading to a storm drain or receiving water.
- Choose one or more of the source control BMP options listed below for stockpiles greater than 5 cubic yards of erodible or water soluble materials such as soil, road deicing salts, compost, unwashed sand and gravel, sawdust, etc. or for outside storage areas for solid materials such as logs, bark, lumber, metal products, etc.:
  - Store in a building or paved and bermed covered area as shown in Figure 4 - 7.
  - Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material.

OR

- Pave the area and install a stormwater drainage system. Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes contact between stormwater (e.g., pooling) and leachable materials in compost, logs, bark, wood chips, etc.
- For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material offsite or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without being conveyed through a treatment BMP. For log yards see Ecology publication, "Industrial Stormwater General Permit Implementation Manual for Log Yards", publication # 04-10-031.
- Convey contaminated stormwater from the stockpile area to a stormwater treatment device as required by this manual or other permit.
- Sweep areas that show accumulation of materials. Vacuum sweeping is also an acceptable method of removing accumulated material.

#### 4.5.1.3 Recommended BMPs

- Maintain drainage areas in and around storage of solid materials with a minimum slope of 1.5 percent to prevent pooling and minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter where it can be collected, or to internal drainage “alleyways” where material is not stockpiled.
- If and when feasible, collect and recycle water-soluble materials (leachates) to the stockpile.
- Stock cleanup materials such as brooms, dustpans, and vacuum sweepers near the storage area.



**Figure 4 - 7. Covered Storage Area for Bulk Solids (including berm if needed)**

## **4.5.2 BMP A402: Storage and Treatment of Contaminated Soils**

### **4.5.2.1 Description of Pollutant Sources**

This activity applies to businesses and agencies that store and treat soils contaminated with toxic organic compounds, petroleum products, or heavy metals. Stormwater runoff that comes in contact with contaminated soil can carry those contaminants along with loose dirt into receiving waters.

### **4.5.2.2 Required BMPs**

Permits may be required by the Washington State Department of Ecology, Environmental Protection Agency, Tacoma/Pierce County Health Department, Puget Sound Clean Air Agency, and/or City of Tacoma Source Control depending on the nature of the project. The applicant is responsible for determining if permits are required from additional agencies. Contact each agency to determine their permitting requirements.

The BMPs included here are intended as a supplement to other regulations. The following BMPs or equivalent measures are required of all businesses engaged in storage and treatment of contaminated soils:

- The storage area for contaminated soils must be enclosed indoors, covered, or contained by a curb, dike, or berm constructed around the material storage area. If the contaminated soils are covered, stormwater run-on protection must also be provided. BMP S107 provides further details on containment and run-on prevention.
- Employees must be educated on methods to prevent contamination from leaving the site.
- Cleanup materials must be stocked near the storage area.
- Gutters, storm drains, catch basins, and other drainage system features on the site must be cleaned following the completion of site work, or at least once per year, whichever comes first. Sediments from such cleaning must be disposed of properly. See BMP S109 and S102 for details on catch basin cleaning and disposal options.

### **4.5.2.3 Recommended BMPs**

The following BMPs are not required but can provide additional pollution protection:

- If feasible, the storage area should be swept weekly for collection of stray soil, which can be added back to the piles or properly disposed. See BMP S102 for information on disposal options.
- Implement an appropriate stormwater treatment BMP per Volume 5.

The use of any treatment BMP must not result in the violation of groundwater, surface water, wastewater, or drinking water quality standards.

### **4.5.3 BMP A403: Temporary Storage or Processing of Fruits or Vegetables**

#### **4.5.3.1 Description of Pollutant Sources**

This activity applies to businesses that temporarily store fruits and vegetables outdoors prior to processing or sale, or that crush, cut, or shred fruits or vegetables for wines, frozen juices, and other food and beverage products. These businesses may include farmers markets, fruit and vegetable stands, and fruit and vegetable processors. Nutrients and soil washing off of fruit and vegetables can have a detrimental effect on receiving waters.

Pollutants of concern include nutrients, suspended solids, biochemical oxygen demand (BOD), and color.

#### **4.5.3.2 Required BMPs**

Businesses that store or process fruits and vegetables are required to be covered under an Individual NPDES Permit and may require an Industrial Wastewater Discharge Permit from the City of Tacoma. Contact the Washington State Department of Ecology for information on BMPs related to fruit and vegetable processing and storing. Additional permitting may be required from the Tacoma/Pierce County Health Department.

## **4.5.4 BMP A404: Storage of Solid Wastes and Food Wastes**

### **4.5.4.1 Description of Pollutant Sources**

This activity applies to facilities such as hospitals, restaurants, meat and seafood markets, veterinarian clinics, schools, grocery stores, assisted living centers, and group assembly halls that store solid wastes and food wastes outdoors. This includes ordinary garbage. If improperly stored, these wastes can contribute a variety of pollutants to stormwater. For more information, call the Solid Waste Section at 253-541-5543.

Certain Food Service establishments are required to obtain a permit from the Tacoma/Pierce County Health Department, which may include inspection of the garbage facilities. Call the Pierce County Waste Management Section at 253-798-6047 for additional information.

**NOTE:** Dangerous solid wastes must be stored and handled under special guidelines. Businesses and agencies that store dangerous wastes must follow specific regulations outlined by the Department of Ecology and, in some cases, the Tacoma-Pierce County Health Department (TPCHD). Ecology regulations are outlined in Volume 4, Chapter 5. Please contact the Department of Ecology at 360-407-6300 and the TPCHD at 253-798-6047 for the specific requirements and permitting information.

Pollutants of concern include toxic organic compounds, oils and greases, heavy metals, nutrients, suspended solids, chemical oxygen demand (COD), and biochemical oxygen demand (BOD).

### **4.5.4.2 Required BMPs**

The following BMPs are required of all businesses and public agencies engaged in storage of non-dangerous solid wastes or food wastes:

- All solid and food wastes must be stored in suitable containers. Piling of wastes without any cover is prohibited.
- Waste storage areas and trash enclosures for food or liquid bearing wastes must be connected to the sanitary sewer and bermed or sloped to prevent stormwater run-on.
- Trash compactors or dumpsters for food or liquid-bearing wastes shall drain to the sanitary sewer system and be designed as required by the City of Tacoma Source Control Department. Trash compactor hydraulic reservoirs or hoses shall be contained within the perimeter of the drainage pad.
- Storage containers and compactors must be checked for leaks and broken seals and replaced if they are leaking, corroded, or otherwise deteriorating. If storage containers contain liquid wastes of any kind, then the container shall be located on a pad equipped with a drainage system connected to the City sanitary sewer.
- A minimum of three feet of clearance must be maintained between a trash compactor or dumpster and any other storage containers kept in the storage area or trash enclosure. Alternatively, these storage containers can be kept in separate enclosures.
- Storage containers must have leak-proof lids or be covered by some other means. Lids must be kept closed at all times. This is especially important for dumpsters, as birds can pick out garbage and drop it, promoting rodent, health, and stormwater problems.

OR

- If lids cannot be provided for the waste containers, or they cannot otherwise be covered, a designated waste storage area must be provided with a containment berm, dike, or

curb, and the designated area must drain to a sanitary sewer or holding tank for further treatment. See BMP S107 and S103 for more information.

- Do not completely fill containers of waste fats, oil and grease. Leave a minimum of four inches of freeboard to prevent spills when the containers are moved or handled for recycling.
- Employees must be trained to frequently check storage containers for leaks and to ensure that the lids are on tightly.
- The waste storage area must be swept or otherwise cleaned frequently to collect all loose solids for proper disposal in a storage container. Do not hose the area to collect or clean solids. All solids must be swept and properly disposed of before hosing area.
- If containers are cleaned, all rinse water from cleaning must be disposed of in a sanitary sewer or septic system.
- Inspect regularly and clean out catch basins on the property that receive drainage from waste storage area. See BMP S109 for details on catch basin cleaning.
- Store containers such that wind will not be able to knock them over.

#### **4.5.4.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution protection:

- Provide a backup storage container if the amount of waste accumulated appears to frequently exceed the capacity of the storage container.
- Locate drain to sanitary sewer at one end or side of the enclosure to ease cleaning the drain.
- In enclosures with drains to the sanitary sewer, provide an area for washing floor mats.
- Designate a storage area, pave the area, and slope the drainage to a holding tank or sanitary sewer drain. If a holding tank is used, the contents must be pumped out before the tank is full and properly disposed. See BMP S102 for more information on disposal options.
- Compost appropriate wastes. Contact City of Tacoma Solid Waste at 253-591-5543 for more information on composting.
- Recycle solid wastes. Contact City of Tacoma Solid Waste. at 253-591-5543 for more information.

## **4.5.5 BMP A405: Farmer's Markets**

### **4.5.5.1 Description of Pollutant Sources**

Potential sources of pollutants include food waste, oil and grease, water that has come into contact with food, waste from equipment washing, and other typical garbage items. Examples of waste sources include: ice and water that has come into contact with food (either in produce washing or temperature regulation), cooking equipment washwater, and hand washing centers.

### **4.5.5.2 Required BMPs**

- Dispose of wastewater into the sanitary sewer system. Wastewater shall not be disposed in the stormwater system. Either transport wastewater back to regular place of business for proper disposal, at the disposal site approved by the Tacoma/Pierce County Health Department as part of the food handling permit, or at the event's designated wastewater disposal sink.
- Fats, grease and oils shall not be disposed in the stormwater or sanitary system. Recycle cooking oils or secure for proper disposal.
- Clean flower water may be disposed into nearby grassy areas. Do not dispose of flower water directly into stormwater drains.
- Food carts and mobile food vendors must obtain and follow the requirements of a mobile food vendor permit as issued by the Tacoma/Pierce County Health Department.

## **4.5.6 BMP A406: Recyclers and Scrap Yards**

### **4.5.6.1 Description of Pollutant Sources**

Includes businesses that reclaim various materials for resale or for scrap, such as vehicles and vehicle/ equipment parts, construction materials, metals, computers, appliances, beverage containers, and papers.

Potential sources of pollutants include paper, plastic, metal scrap debris, engines, transmissions, radiators, batteries, and other materials that contain fluids or are contaminated with fluids. Other pollutant sources include leachate from metal components, contaminated soil, and the erosion of soil. Activities that can generate pollutants include the transfer, dismantling, and crushing of vehicles and scrap metal; the transfer and removal of fluids; maintenance and cleaning of vehicles, parts, and equipment; and storage of fluids, parts for resale, solid wastes, scrap parts, and materials, equipment and vehicles that contain fluids, generally in uncovered areas.

Potential pollutants typically found at vehicle recycle and scrap yards include oil and grease, ethylene and propylene glycol, total suspended solids, BOD, heavy metals, and acidic pH.

### **4.5.6.2 Required BMPs**

For facilities subject to Ecology's Industrial Stormwater General Permit refer to BMP Guidance Document #94-146, "Vehicle Recyclers: A Guide to Implementing the Industrial Stormwater General National Pollutant Discharge Elimination System (NPDES) Permit Requirements", Washington Department of Ecology, January 2006 for selection of BMPs. The BMPs in that guidance document can also be applied to scrap material recycling facilities (depending on the pollutant sources existing at those facilities) and to non-permitted facilities.

Contact the City of Tacoma Source Control Unit at 253-591-5588 if contact stormwater or process wastewater is to be discharged from your site.



#### **4.5.7 BMP A407: Treatment, Storage or Disposal of Dangerous Wastes**

This activity applies to businesses and public agencies that are permitted by the Washington State Department of Ecology (DOE) to treat, store, or dispose of dangerous wastes. DOE regulates these facilities with specific requirements, which include the need for a National Pollutant Discharge Elimination System (NPDES) permit. Detailed BMPs are not included in this manual since site requirements for these facilities are well beyond the level of typical BMP applications. See Chapter 5 of this volume for reference information.

Contact the City of Tacoma Source Control Unit at 253-591-5588 for their requirements. An Industrial Wastewater Discharge Permit is required before discharging contact stormwater or process wastewater to the City sanitary sewer system. The Tacoma-Pierce County Health Department also administers some aspects of dangerous waste treatment, storage, and disposal. Call 253-798-6047 for more information.

## **4.5.8 BMP A408: Storage of Liquid, Food Waste or Dangerous Waste Containers**

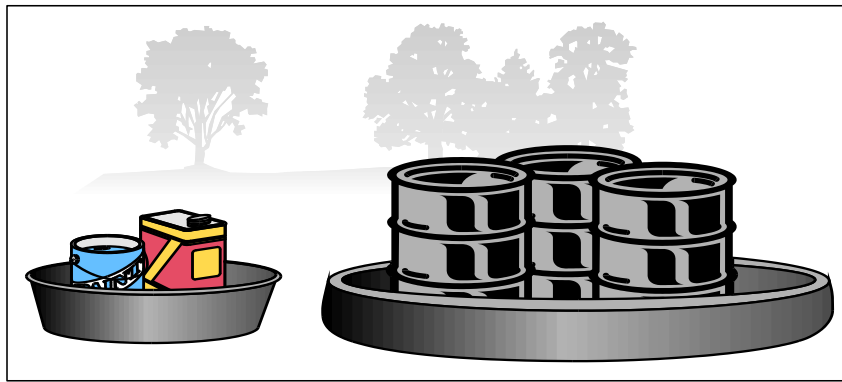
### **4.5.8.1 Description of Pollutant Sources**

Steel and plastic drums with volumetric capacities of 55 gallons or less are typically used at industrial facilities for storage of liquids and powders. The BMPs specified below apply to container(s) located outside a building used for temporary storage of accumulated food wastes, vegetable or animal grease, used oil, liquid feedstock cleaning chemicals, or Dangerous Wastes (liquid or solid), unless the business is permitted by Ecology to store the wastes. Leaks and spills of pollutant materials during handling and storage are the primary sources of pollutants. Oil and grease, acid/alkali pH, BOD, and metals are potential pollutant constituents.

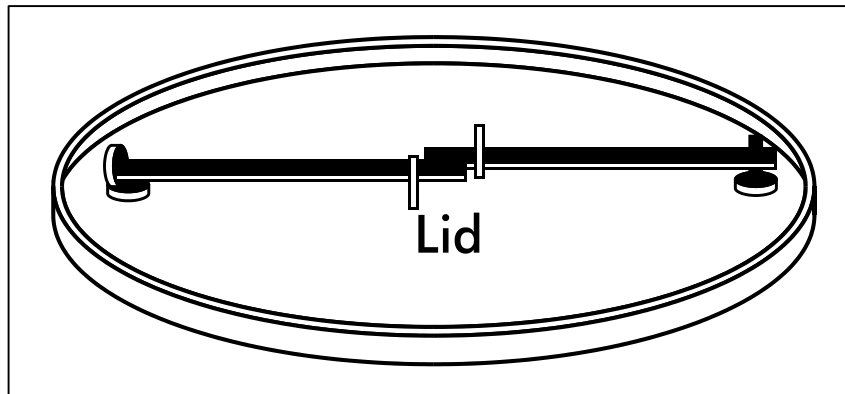
### **4.5.8.2 Required BMPs**

- Place tight-fitting lids on all containers. Provide adequate freeboard/headspace.
- Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
- Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers daily for leaks/spills. Replace containers, secure lids, and replace and tighten bungs in drums, as needed.
- Drums stored in an area where unauthorized persons may gain access must be secured in a manner that prevents accidental spillage, pilferage, or any unauthorized use (see Figure 4 - 9).
- If the material is a Dangerous Waste, the business owner must comply with any additional Ecology requirements as specified in Chapter 5.
- Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code.
- Cover dumpsters or keep them under cover, such as a lean-to, to prevent the entry of stormwater. Replace or repair leaking garbage dumpsters.
- Drain dumpsters and/or dumpster pads to sanitary sewer. Keep dumpster lids closed. Install waterproof liners.
- Keep containers with Dangerous Waste, food waste or other potential pollutant liquids inside a building unless this is impracticable due to site constraints or Uniform Fire Code requirements.
- Store containers in a designated area that is covered, bermed, or diked; paved; and impervious in order to contain leaks and spills (see Figure 4 - 10). The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.
- For liquid wastes, surround the containers with a dike as illustrated in Figure 4 - 10. The dike must be of sufficient height to provide a volume of either 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater, or, if a single container, 110 percent of the volume of that container.
- Where material is temporarily stored in drums, a containment system can be used, as illustrated, in lieu of the above system (see Figure 4 - 8).
- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer (see Figure 4 - 11).

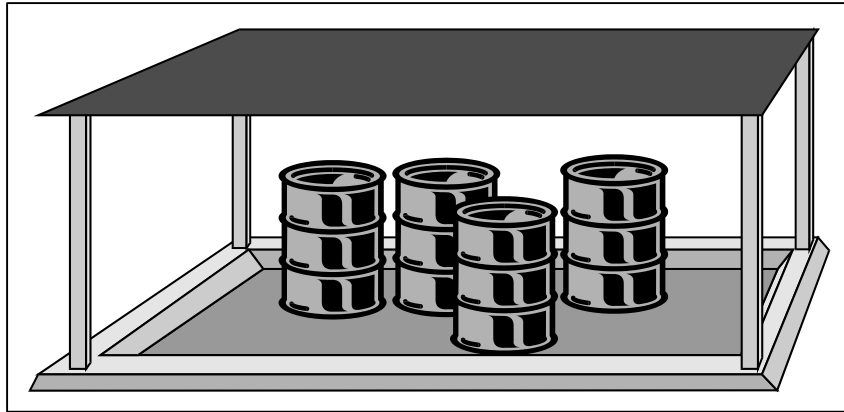
- For stormwater in a containment area, the containment area shall contain a sumped outlet. The sump outlet must be a lockable steel line of a diameter sufficient to handle the contained water. Before the valve is opened, the stormwater must be evaluated to determine if it must go to treatment or can be discharged without treatment. If the stormwater is contaminated, direct the sump outlet of the containment area to a stormwater treatment system appropriate for the products contained, or to sanitary sewer system. Discharges must not be directed toward sensitive areas, foundations, sidewalks, traffic or the City right-of-way.
- Another option for discharge of contaminated stormwater is to provide a dead-end sump or catchment. Stormwater can then be pumped to a tank truck or other appropriate vehicle for off-site treatment and/or disposal.
- If a storage area is to be used on-site for less than 30 days, a portable temporary secondary system as shown in Figure 4 - 8 can be used.



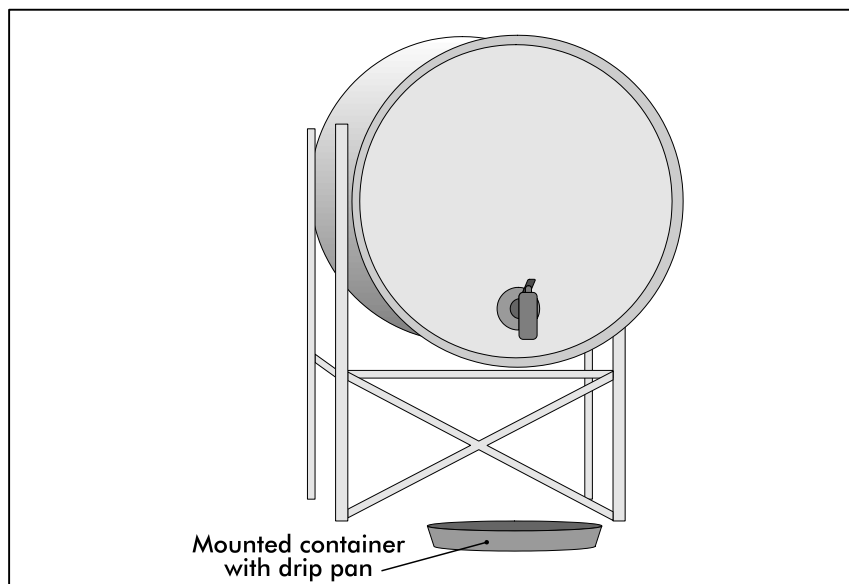
**Figure 4 - 8. Secondary Containment Vessel**



**Figure 4 - 9. Locking System for Drum Lid**



**Figure 4 - 10. Covered and Bermed Containment Area**



**Figure 4 - 11. Mounted Container**

## **4.5.9 BMP A409: Storage of Liquids in Above-Ground Tanks**

### **4.5.9.1 Description of Pollutant Sources**

Above-ground tanks containing liquids (excluding uncontaminated water) may be equipped with a valved drain, vent, pump, and bottom hose connection. These tanks are commonly associated with chemical and petroleum facilities and standby generators (see Figure 4 - 13 and Figure 4 - 14). These tanks may be heated with steam heat exchangers equipped with steam traps. Leaks and spills can occur at connections and during liquid transfer. Oil and grease, organics, acids, alkalis, and heavy metals in tank water and condensate drainage can also cause stormwater contamination at storage tanks.

### **4.5.9.2 Required BMPs for All Tanks**

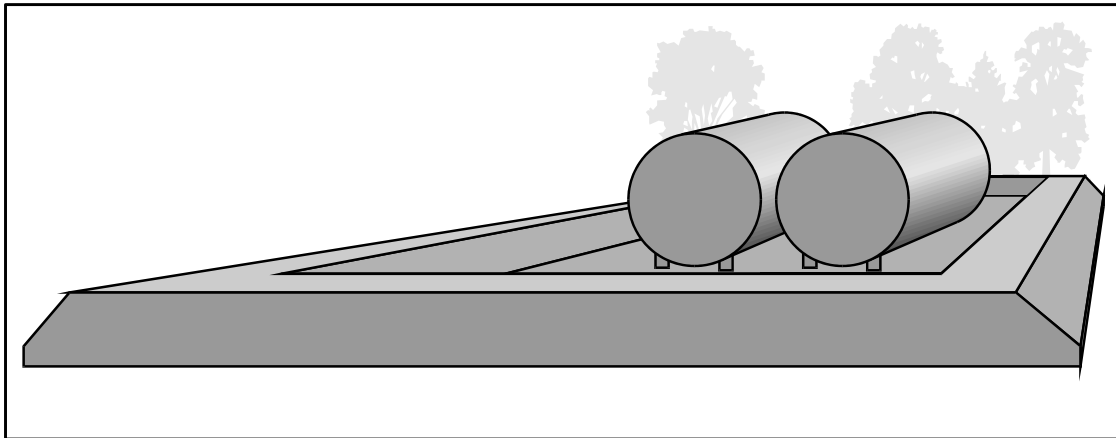
- Install secondary containment or a double-walled tank.
- For stormwater in a containment area, the containment area shall contain a sumped outlet. The sump outlet must be a lockable steel line of a diameter sufficient to handle the contained water. Before the valve is opened, the stormwater must be evaluated to determine if it must go to treatment or can be discharged without treatment. If the stormwater is contaminated, direct the sump outlet of the containment area to a stormwater treatment system appropriate for the products contained, or to a sanitary sewer system. Discharges must not be directed toward sensitive areas, foundations, sidewalks, traffic, or the City right-of-way.
- Inspect the tank containment areas regularly to identify leaks/spills, cracks, corrosion, etc. in problem components such as fittings, pipe connections, and valves.
- Develop a spill plan as per the requirements of BMP A714: Spills of Oil and Hazardous Substances.
- Place adequately sized drip pans beneath all mounted taps and drip/spill locations during filling/unloading of tanks. Valved drain tubing may be needed in mounted drip pans.
- Sweep and clean the tank storage area regularly, if paved.
- Replace or repair tanks or other components that are leaking, corroded, or otherwise deteriorating.
- All installations shall comply with the International Fire Code and the National Electric Code.
- Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes as illustrated in Figure 4 - 12 and Figure 4 - 13, or use UL approved double-walled tanks.
- Tanks with exposure to traffic must be protected with bollards, jersey barriers, or walls. Bollards should be at least 4 feet high, at least 3 feet from the tank, and no more than 4 feet apart. It is recommended that bollards are painted yellow for ease of visibility.
- Include a tank overfill protection system to minimize the risk of spillage during loading.
- There must be at least 5 feet of space between the tanks and any enclosures.
- Tank water and condensate discharges are process wastewater that may need an NPDES Permit or approval from the City of Tacoma Source Control to discharge to the sanitary system.

#### **4.5.9.3 Required BMPs for Single-walled Tanks**

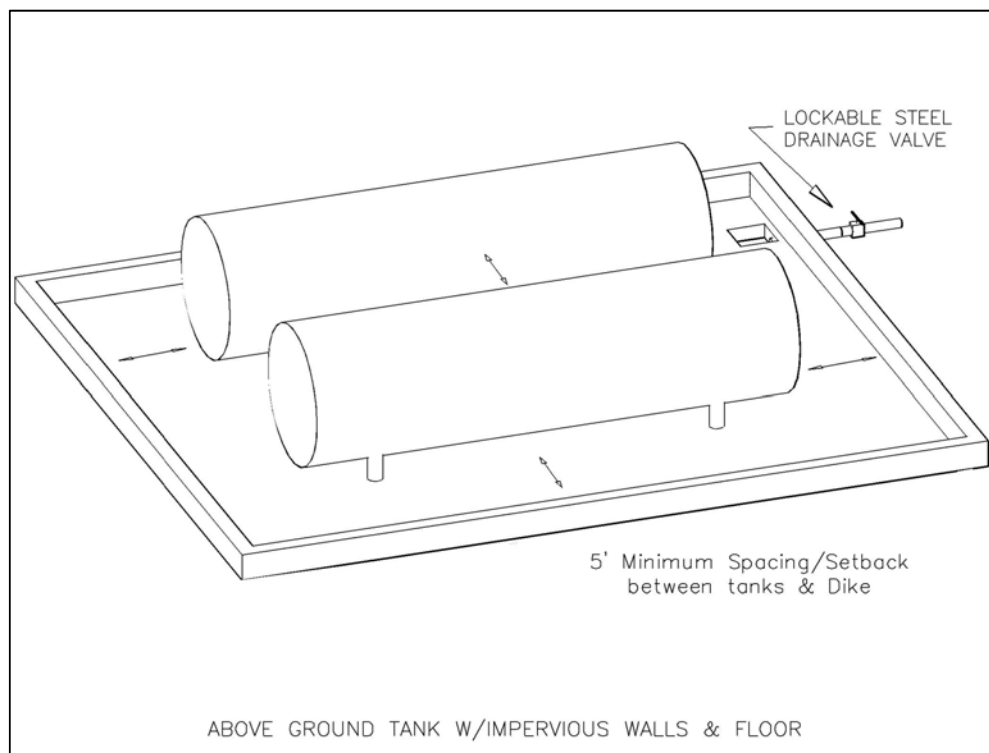
- The containment volume shall be 100% of the volume of the largest tank plus the volume of stormwater from rain events up to a 25-year, 24-hour storm within the containment area or 110% of the volume of the largest tank, whichever is greater.
- There must be at least 5 feet of space between the tanks and any enclosures.
- Slope the secondary containment to drain to a dead-end sump (optional), or equivalent, for the collection of small spills.
- If the tank containment area is uncovered, equip the outlet from the spill-containment sump with a shutoff valve, which is normally closed and locked. Valves for flammables containment shall be made of steel. Valves for corrosives containment shall be compatible with the material being stored.
- The external valve may be opened manually only to convey contaminated stormwater to an approved treatment or disposal facility, or to convey uncontaminated stormwater to a storm drain. Evidence of contamination can include the presence of visible sheen, color, or turbidity in the runoff, or existing or historical operational problems at the facility. Simple pH measurements with litmus or pH paper can be used for areas subject to acid or alkaline contamination.
- At petroleum tank farms, convey stormwater contaminated with floating oil or debris in the contained area through an API or CP-type oil/water separator (Volume 5, Treatment BMPs) or other approved treatment facility prior to discharge to storm drain or surface water. Direct discharges may require additional permits from Department of Ecology or other agencies within jurisdictions.
- Loading racks and transfer areas associated with tank farms shall provide spill containment and treatment sized to encompass the largest vessel (trailer, railcar, intermodal tank) using the area.

#### **4.5.9.4 Required BMPs for Double-walled Tanks**

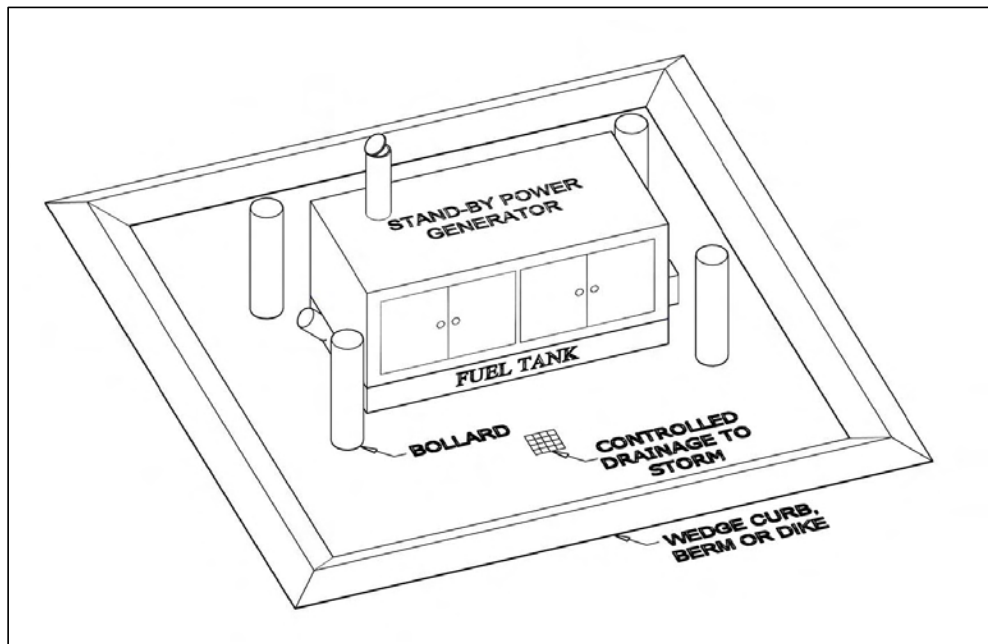
- Tank pads and the fuel delivery area should be protected from stormwater run-on and sized and sloped to capture any leaks or spills from the tank or fueling process.
- Feed and return lines from the tanks shall be doubled walled or entirely contained within the utility corridor.
- Catch basins receiving drainage from the tank pad and fueling area should be oversized and have downturned elbows in their outlets or flow to an appropriately sized oil/water separator.
- This section does not apply to temporary job-site fuel tanks. See Volume 2 for BMPs concerning spill management at construction sites.



**Figure 4 - 12. Above-Ground Tank Storage**



**Figure 4 - 13. Above-Ground Tank with Impervious Walls and Floor**



**Figure 4 - 14. Standby Generator**



## **4.5.10 BMP A410: Parking and Storage for Vehicles and Equipment**

### **4.5.10.1 Description of Pollutant Sources**

Parked vehicles at public and commercial parking lots and garages, such as retail stores, fleet vehicle (including rent-a-car lots and car dealerships), equipment sale and rental parking lots, and parking lot driveways, can be sources of toxic hydrocarbons and other organic compounds, oils and greases, metals, and suspended solids.

### **4.5.10.2 Required BMPs**

- If washing of a parking lot is conducted, discharge the washwater to a sanitary sewer (if allowed by the City of Tacoma) or other approved wastewater treatment system, or collect it for off-site disposal.
- Do not hose down the area to a storm drain or receiving water. Sweep (vacuum sweeping is preferred) parking lots, storage areas, and driveways regularly to collect dirt, waste, and debris.
- An oil removal system such as an API or CP oil and water separator, catch basin filter, or equivalent BMP (see Volume 5), approved by the City of Tacoma, is applicable for parking lots meeting the threshold vehicle traffic intensity level of a high-use site. For more information on high-use sites, refer to Volume 5, Chapter 1.
- Covered floors of parking garages with drains must drain to the sanitary sewer through an approved oil/water separator. Uncovered floors must be routed to the storm drainage system through an approved treatment device.

## **4.6 Construction and Demolition Activities**

### **4.6.1 BMP A501: Clearing, Grading and Preparation of Construction Sites**

This activity applies to businesses and municipal agencies that develop lands for construction. It also applies to residences that undertake large yard clearing and grading projects. Stormwater runoff from bare ground can be loaded with dirt and other pollutants. This material can clog ditches and stream channels, thus reducing carrying capacity and increasing flooding, as well as smothering spawning beds for fish. Simply controlling runoff and not allowing it to leave the site will prevent these harmful effects. Clearing, grading, and preparation activities are covered in detail in Volume 2 of this manual, Construction Stormwater Pollution Prevention. Grading activities are also regulated in the City of Tacoma by the Grading and Excavation Code, Section 2.02.330 TMC.

Control of stormwater run-on and soil stabilization is critical. Limiting the area to be cleared and graded during wet weather seasons will make site stabilization and sediment control easier.

Coverage under Ecology's Construction Stormwater General Permit is required for construction sites that result in the disturbance of one acre or more of land. Compliance with the Construction Stormwater Pollution Prevention requirements in Ecology's manual is required, as applicable.

### **4.6.2 BMP A502: Demolition of Buildings**

#### **4.6.2.1 Description of Pollutant Sources**

This activity applies to removal of existing buildings by controlled explosions, wrecking balls, or manual methods, and subsequent clearing of the rubble. The loose debris can contaminate stormwater. Pollutants of concern include toxic organic compounds, heavy metals, asbestos, and suspended solids.

#### **4.6.2.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses and public agencies engaged in building demolition:

- Identify and properly abandon all utility connections such as sanitary sewer, gas, fuel lines and tanks.
- If directed to keep water out of the storm system during demolition activity, storm drain covers or a similarly effective containment device must be placed on all nearby drains to prevent dirty runoff and loose particles from entering the storm drainage system. If storm drains are not present, dikes, berms, or other methods must be used to protect overland discharge paths from runoff. See BMP S102 and S107 for more information on runoff control and disposal options.
- Utilize storm drain inlet protection per Volume 2, BMP C220: Storm Drain Inlet Protection.
- Street gutters, sidewalks, driveways, and other paved surfaces in the immediate area of the demolition must be swept at the end of each work day to collect and properly dispose of loose debris and garbage.
- Sweep areas that show accumulation of materials. Vacuum sweeping is also an acceptable method of removing accumulated material.

#### **4.6.2.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution protection:

- Use dust control methods as described in Volume 2, BMP C140: Dust Control and/or per this volume BMP A601: Dust Control at Disturbed Land Areas and Unpaved Roads and Parking Lots.
- If possible, a wall should be constructed to prevent stray building materials and dust from escaping the area during demolition.
- Schedule demolition to take place at a dry time of the year.

### **4.6.3 BMP A503: Building, Repair, Remodeling and Construction**

#### **4.6.3.1 Description of Pollutant Sources**

This activity refers to activities associated with construction of buildings and other structures, remodeling of existing buildings and houses, and general exterior building repair work. Washing of buildings is covered under A103 Washing, Pressure Washing, and Steam Cleaning. Painting of buildings is covered under A307 Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment. Concrete pouring is covered under A302 Concrete Pouring and Asphalt Application at Temporary Sites.

Pollutants of concern include toxic organics, suspended solids, heavy metals, asbestos, pH, oils, PCBs and greases.

#### **4.6.3.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses engaged in building repair, remodeling, and construction:

- Employees must be educated about the need to control site activities to prevent stormwater pollution, and also must be trained in spill cleanup procedures.
- Spill cleanup materials, appropriate to the chemicals being used on site, must be available at the work site at all times.
- The work site must be cleaned up at the end of each work day, with materials such as solvents put away indoors or covered and secured so that vandals will not have access to them.
- The area must be swept daily to collect loose litter, paint chips, grit, and dirt.
- Absolutely no substance can be dumped on pavement, the ground, or in or toward storm drains, regardless of its content, unless it is only uncontaminated water.
- Bermed ground or drop cloths must be used underneath scraping and sandblasting work. Ground cloths, buckets, or tubs must also be used anywhere that work materials are laid down.
- Tools covered with non-water-based finishes or other materials must be cleaned in a manner that enables collection of used solvents for recycling or proper disposal. See BMP S102 for disposal options.
- Inlet protection as described in Volume 2, BMP C220: Storm Drain Inlet Protection must be used if dust, grit, washwater, or other pollutants may escape the work area. This is particularly necessary on rainy days. Provide inlet protection of the storm drain at the beginning of the work day. Don't perform outdoor work during wet weather if contaminants could be washed off-site by rainfall.

#### **4.6.3.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution protection:

- Recycle materials whenever possible.
- Use dust control methods as described in Volume 2, BMP C140: Dust Control and/or per this volume BMP A601: Dust Control at Disturbed Land Areas and Unpaved Roads and Parking Lots.
- Activities such as tool cleaning should occur over a ground cloth or within a containment device such as a tub.

## **4.7 Dust Control, and Soil and Sediment Control**

### **4.7.1 BMP A601: Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots**

#### **4.7.1.1 Description of Pollutant Sources**

Dust can cause air and water pollution problems particularly at demolition sites, disturbed land areas, and unpaved roadways and parking lots.

#### **4.7.1.2 Required BMPs**

- Sprinkle or wet down soil or dust with water as long as it does not result in runoff or a wastewater discharge. Minimize the amount of water to avoid washing pollutants into the storm drainage system. At active construction sites, street sweeping shall be performed prior to washing the street.
- Use only local and/or state government approved dust suppressant chemicals such as those listed in Ecology Publication #96-433, "Techniques for Dust Prevention and Suppression." See BMP C126, Polyacrylamide for Soil Erosion Protection, in Volume 2, Chapter 3 of this manual.
- Avoid excessive and repeated applications of dust suppressant chemicals. Time the application of dust suppressants to avoid or minimize their wash-off by rainfall or human activity such as irrigation.
- Use stormwater containment to prevent the conveyance of solids by stormwater into storm drains or receiving waters.
- The use of motor oil or other oils for dust control is prohibited. Care shall be taken when using lignin derivatives and other high BOD chemicals in excavations or areas easily accessible to surface water or groundwater.
- Consult with the Ecology Southwest Regional Office at 360-407-6300 on discharge permit requirements if the dust suppression process results in a wastewater discharge to the ground, groundwater, storm drain, or surface water.

#### **4.7.1.3 Recommended BMPs for Roadways and Other Trafficked Areas**

- Consider limiting use of off-road recreational vehicles on dust generating land.
- Consider paving unpaved permanent roads, approaches, exits, access lanes, and other trafficked areas at municipal, commercial, and industrial areas.
- Consider paving or stabilizing shoulders of paved roads with gravel, vegetation, or City of Tacoma approved chemicals.
- Encourage use of alternate paved routes, if available.
- Vacuum or wet sweep fine dirt and skid control materials from paved roads soon after winter weather ends or as needed.
- Consider using traction sand that is pre-washed to reduce dust emissions.

**4.7.1.4 Recommended BMPs for Dust Generating Areas**

- Prepare a dust control plan. Helpful references include Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures (EPA-450/2-92-004).
- Limit exposure of soil (dust source) as much as feasible.
- Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
- Apply windbreaks in the soil such as trees, board fences, tarp curtains, bales of hay, etc.
- Cover dust-generating piles with wind-impervious fabric, or equivalent material.

Additional information on dust control can be found in Volume 2 of this manual.

## **4.7.2 BMP A602: Dust Control at Manufacturing Sites**

### **4.7.2.1 Description of Pollutant Sources**

Industrial material handling activities can generate considerable amounts of dust that is typically removed using exhaust systems. This can generate air emissions that can contaminate stormwater. Dusts can be generated at cement and concrete product mixing facilities, foundries, and wherever powdered materials are handled. Particulate materials that are of concern to air pollution control agencies include grain dust, sawdust, coal, gravel, crushed rock, cement, and boiler fly ash. The objective of this BMP is to reduce the stormwater pollutants caused by dust generation and control.

### **4.7.2.2 Required BMPs**

- Clean building roofs, powder material handling equipment, and vehicles that can be sources of stormwater pollutants as needed to remove accumulated dust and residue.
- Regularly sweep dust accumulation areas that can contaminate stormwater. Sweeping shall be conducted using vacuum filter equipment to minimize dust generation and to ensure optimal dust removal.
- Minimize the amount of water used for dust control to avoid washing pollutants into the storm drainage system.

### **4.7.2.3 Recommended BMPs**

- In manufacturing operations, train employees to carefully handle powders to prevent generation of dust.
- Use dust filtration/collection systems such as bag house filters, cyclone separators, etc. to control vented dust emissions that could contaminate stormwater. It may be necessary to monitor rooftops for possible accumulations of materials and take appropriate measures to prevent this material from entering the storm drainage system. Control of dust at foundries, metal shredders, stone and tile cutting facilities, and material transfer and handling facilities are some examples.
- Use approved dust suppressants such as those listed in Ecology Publication "Techniques for Dust Prevention and Suppression," #96-433. (Ecology, 2003). Application of some products may not be appropriate in close proximity to receiving waters or conveyances close to receiving waters. For more information check with the Ecology Southwest Regional Office or the City of Tacoma.
- Use water quality treatment BMPs as necessary. Refer to Volume 5 for information regarding water quality treatment BMPs.
- Additional information on dust control can be found in Volume 2 of this manual.

### **4.7.3 BMP A603: Soil Erosion and Sediment Control at Industrial Sites**

#### **4.7.3.1 Description of Pollutant Sources**

Industrial activities on soil areas, exposed and disturbed soils, steep grades, etc. can be sources of sediments that can contaminate stormwater runoff.

#### **4.7.3.2 Required BMPs**

Permanently stabilize areas not being worked. Apply temporary cover to areas not immediately being worked. Refer to Volume 2 for additional information concerning temporary erosion protection measures.



## **4.8 Other Activities**

### **4.8.1 BMP A701: Commercial Animal Handling Areas**

#### **4.8.1.1 Description of Pollutant Sources**

Racetracks, kennels, fenced pens, veterinarians, and businesses that provide boarding services for horses, dogs, cats, etc. can generate pollutants from activities such as manure deposits, animal washing, grazing, and any other animal handling activity that could contaminate stormwater. Pollutants can include coliform bacteria, nutrients, total suspended solids, and animal-related pharmaceuticals. Kennels shall be as defined in TMC 17.03.

#### **4.8.1.2 Required BMPs**

- Regularly scoop, sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants.
- Do not hose down to storm drains or receiving waters those areas that contain potential stormwater contaminants.
- Contaminated water must go to the sanitary sewer. An animal fur/hair interceptor may be required.
- Do not allow any wash water to be discharged to storm drains or to receiving water. Wash water shall be conveyed to the sanitary sewer system.
- If animals are kept in unpaved and uncovered areas, the ground must either have vegetative cover or some other type of ground cover, such as mulch.
- If animals are not leashed or in cages, the area where animals are kept must be surrounded by a fence or other devices to prevent animals from moving away from the controlled area where BMPs are used.
- Uncovered outdoor runs shall not be connected to the sanitary sewer system unless approved by Environmental Services. No contaminated runoff may enter the storm drains.
- Unused pet pharmaceuticals shall not be discharged to the municipal sewer system. They shall be returned to the animal's owner or deposited to a drug take-back disposal facility. See <http://www.co.pierce.wa.us/pc/abtus/ourorg/sheriff/RxDropbox.htm> or <http://www.takebackyourmeds.org> for drop-off locations. See the City of Tacoma Medical Waste Sanitary Policy for additional information on medical waste disposal.

## **4.8.2 BMP A702: Log Sorting and Handling**

### **4.8.2.1 Description of Pollutant Sources**

Log yards are paved or unpaved areas where logs are transferred, sorted, debarked, cut, and stored to prepare them for shipment or for the production of dimensional lumber, plywood, chips, poles, or other products. Log yards are generally maintained at sawmills, shipping ports, and pulp mills. Typical pollutants include oil and grease, BOD, settleable solids, total suspended solids (including soil), high and low pH, heavy metals, pesticides, wood-based debris, and leachate.

Truck traffic to and from these facilities can track sediment onto roadways. An aggressive sweeping program is recommended to ensure sediment does not reach the storm system.

The following are pollutant sources:

- Log storage, rollout, sorting, scaling, and cutting areas
- Log and liquid loading areas
- Log sprinkling
- Debarking, bark bin, and conveyor areas
- Bark, ash, sawdust and wood debris piles, and other solid wastes
- Metal salvage areas
- Truck, rail, ship, stacker, and loader access areas
- Log trucks, stackers, loaders, forklifts, and other heavy equipment
- Maintenance shops and parking areas
- Cleaning areas for vehicles, parts, and equipment
- Storage and handling areas for hydraulic oils, lubricants, fuels, paints, liquid wastes, and other liquid materials
- Pesticide usage for log preservation and surface protection
- Application of herbicides for weed control
- Contaminated soil resulting from leaks or spills of fluids

### **4.8.2.2 Ecology's Baseline General Permit Requirements:**

Industries with log yards are required to obtain coverage under the baseline General Permit for Discharges of Stormwater Associated with Industrial Activities to Surface Water. The permit requires preparation and on-site retention of Stormwater Pollution Prevention Plans (SWPPP). The SWPPP must identify operational, source control, erosion and sediment control, and, if necessary, treatment BMPs. Required and recommended operational, source control, and treatment BMPs are presented in detail in Ecology's Guidance Document: Industrial Stormwater General Permit Implementation Manual for Log Yards, Publication # 04-10-031. It is recommended that all log yard facilities obtain a copy of this document.

### **4.8.3 BMP A703: Boat Building, Mooring, Maintenance and Repair**

#### **4.8.3.1 Description of Pollutant Sources**

Sources of pollutants at boat and ship building, repair, and maintenance facilities at boatyards, shipyards, ports, and marinas include pressure washing, surface preparation, paint removal, sanding, painting, engine maintenance and repairs, and material handling and storage, if conducted outdoors. Potential pollutants include spent abrasive grits, solvents, oils, ethylene glycol, washwater, paint over-spray, cleaners/detergents, paint chips, scrap metal, welding rods, resins, glass fibers, dust, and miscellaneous trash. Pollutant constituents include TSS, oil and grease, organics, copper, lead, tin, and zinc. Related activities are covered under the following activity headings in this manual, and other BMPs provided in this manual:

A103	Washing, Pressure Washing, and Steam Cleaning of Vehicles/ Equipment/Building Structures
A202	Fueling at Dedicated Stations
A407	Storage of Liquid, Food Waste or Dangerous Waste Containers
A714	Spills of Oil and Hazardous Substances

#### **4.8.3.2 Required BMPs**

The following BMPs or equivalent measures are required of all businesses, public agencies, and private boat owners engaged in boat building, mooring, maintenance and repair that are not covered by the NPDES permit for boatyards:

- Maintenance and repair activities that can be moved on-shore must be moved accordingly. This action reduces some of the potential for direct pollution impact on waterbodies.
- Blasting and spray painting activities must be sheltered by hanging tarps to block the wind and prevent dust and overspray from escaping. Move the activity indoors if possible. See Volume 4, Chapter 5 for details on Puget Sound Clean Air Agency limitations.
- Bermed ground cloths must be used for collection of drips and spills in painting and finishing operations, and for paint chips and used blasting sand from sand blasting.
- Collect spent abrasives regularly and store under cover to await proper disposal.
- Dispose of greasy rags, oil filters, air filters, batteries, zinc anodes, spent coolant, and degreasers properly.
- Drain oil filters before disposal or recycling.
- Bilge water must be collected for proper disposal rather than discharged on land or water. See BMP S102 for detail on disposal options. Several companies are available for bilge pumpout services. Use oil-absorbent pads to capture the oil in the bilge water before or during pumping. If pads are used, they must be recycled or properly disposed.
- Ballast water that has an oily sheen on the surface must be collected for proper disposal rather than discharged on land or water. See BMP S102 for details on disposal options.
- Sewage from sanitary holding tanks on ships must be approved for discharge to the sanitary sewer. Contact the City of Tacoma Source Control Unit at 253-591-5588.
- Solid wastes from international vessels must be evaluated on a case-by-case basis. Contact the City of Tacoma Solid Waste Division at 253-591-5544 for assistance. Galley

wastes may need to be taken to a United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) approved facility. For assistance, contact the local APHIS office during normal business hours at 206-553-2400 or 206-553-4406 after hours.

- Maintenance yard areas must be swept and cleaned, without hosing down the area, at least once per week or as needed. This prevents sandblasting materials, scrapings, paint chips, oils, and other loose debris from being carried away with stormwater. The collected materials must be disposed of properly. See BMP S102 for disposal options.
- Docks and boat ramps must be swept at least once per week or as needed, and the collected materials must be disposed of properly. Dry docks must be swept before flooding.
- Paint and solvent mixing, fuel mixing and similar handling of liquids shall be performed on shore, or such that no spillage can occur directly into surface waterbodies.
- Routine cleanup materials such as oil-absorbent pads, brooms, dustpans, shop vacuums, mops, buckets, and sponges must be stocked near docks.
- When washing a boat in the water, use no soaps or detergents. Brush the hull with water only.
- Comply with BMP A203 and A101 if engine repair and maintenance are conducted.
- In the event of an accidental discharge of oil or hazardous material into waters of the state or onto land with a potential for entry into state waters, immediately notify the yard, port, or marina owner or manager, the Department of Ecology, and the National Response Center at 1-800-424-8802 (24-hour). If the spill can reach or has reached marine waters, contact the U.S. Coast Guard at 206-217-6232.

#### **4.8.3.3 Recommended BMPs**

The following BMPs are not required but can provide additional pollution protection:

- Boat construction and structural repair activities should be covered.
- Materials such as paints, tools, and ground cloths should be stored indoors or in a covered area when not in use.
- Select the least toxic anti-fouling paint available.
- Boat interiors should be routinely cleaned, with proper disposal of collected materials, so that accumulations of water drained from the boat's interior are not contaminated.
- Use sanders that have dust containment bags or use vacuum sanders, and avoid sanding in windy conditions.
- All used oil should be recycled if feasible. Most marinas now offer used oil recycling services. To dispose of filters, let drain 24 hours, then double wrap in plastic and dispose in the regular garbage, or take them to the Tacoma Landfill Household Hazardous Waste facility for recycling. Pending state legislation may make disposal in the garbage illegal, so call the Hazardous Waste Line at 1-800-287-6429 for current information.
- Citizens for a Healthy Bay, a local environmental group, provides "Clean Bay Boating Kits." Call them at 253-383-2429 to obtain a free kit.
- Check with marinas for other BMPs they have developed.
- Use water quality treatment BMPs as necessary for the pollutants of concern. Refer to Volume 5 for information about water quality treatment BMPs.

- Check the Resource Manual for Pollution Prevention in Marinas, Publication # 98-11, May 1998 for additional information.
- Use clean, green boating practices. See <http://www.ecy.wa.gov/programs/wq/nonpoint/cleanboating/> for additional information.

## **4.8.4 BMP A704: Logging**

### **4.8.4.1 Description of Pollutant Sources**

This activity covers logging activities that fall under the Washington State Forest Practices Act category of Class IV general forest practices. These are situations where timber harvesting is done in the process of converting forest lands into other land uses, such as home and business construction. Stormwater runoff from bare ground can be loaded with dirt and other pollutants. This material can clog ditches and stream channels, thus reducing carrying capacity and increasing flooding, as well as smothering spawning beds for fish. Simply controlling runoff and not allowing it to leave the site will prevent these harmful effects. Clearing and grading activities are covered in detail in Volume 2 of this manual, Construction Stormwater Pollution Prevention. Grading activities are also regulated in the City of Tacoma by the Grading and Excavation Code, Section 2.02.370 TMC.

Control of stormwater run-on and soil stabilization is critical. Limiting the area to be cleared and graded during wet weather seasons will make site stabilization and sediment control easier.

Coverage under Ecology's Construction Stormwater General Permit is required for construction sites that result in the disturbance of one acre or more of land. Compliance with the Construction Stormwater Pollution Prevention requirements in Ecology's manual is required, as applicable. Virtually all logging operations will require a permit from the Washington State Department of Natural Resources. Sensitive/critical areas and wetlands ordinances for Tacoma also contain requirements for logging activities in the vicinity of waterbodies.

Pollutants of concern include suspended solids, oils and greases, biochemical oxygen demand (BOD), nutrients, toxic organic compounds, and heavy metals.

### **4.8.4.2 Required BMPs**

- Vegetation along stream corridors, and adjacent to other waterbodies and wetlands, must be preserved. Maintenance of a vegetated buffer enables filtration of most of the pollutants of concern for this activity. The above-mentioned ordinances contain specific requirements for buffer setbacks.
- Logging access roads must have a crushed rock or spall apron construction entrance where they join the pavement to prevent sediments from being tracked onto the pavement.
- On-site fueling and maintenance operations must follow the required BMPs as outlined in A204 Mobile Fueling; A203 Vehicle Maintenance; and A407 Storage of Liquid, Food Waste, or Dangerous Waste Containers.

### **4.8.4.3 Recommended BMPs**

The following BMPs are not required, but can provide additional pollution protection:

- Erosion potential can be reduced by avoiding logging on steep slopes.
- If access roads are constructed for logging, they should be provided with drainage ditches that divert runoff into vegetated areas or stormwater treatment systems.
- Plant vegetated buffers in areas where they are already downslope of proposed logging areas, with sufficient lead time to allow for effective growth.

## **4.8.5 BMP A705: Mining and Quarrying of Sand, Gravel, Rock, Peat, Clay and Other Materials**

### **4.8.5.1 Description of Pollutant Sources**

This activity applies to surface excavation and on-site storage of sand, gravel, and other materials that are mined. All mining operations that have stormwater runoff from the site are required to apply for a National Pollutant Discharge Elimination System (NPDES) permit with the Department of Ecology. Ecology has specific BMPs required by the permit. Some additional BMPs to help meet Ecology's discharge performance standards are listed below. Other permits from the Washington Department of Natural Resources and the City of Tacoma Building and Land Use Services Division may be required.

Pollutants of concern are suspended solids, nutrients, pH, oils, and metals.

### **4.8.5.2 Required BMPs**

- Measures to control track-out and dust shall be implemented. Wheel washes, sweeping, and paving high traffic areas are some common practices.

### **4.8.5.3 Recommended BMPs**

- If the material is appropriate, use excavated spoil material to form compacted berms along downslope sides of the site to contain runoff. Berms should be seeded to promote growth of grass or other vegetation to limit erosion from the berms. Safety measures to prevent flooding due to berm failure shall be considered.
- Semi-permanent stockpiles should be protected from erosion.
- Use sediment ponds to promote settling of suspended solids. Refer to Volume 5 of this manual for more information.
- Use anchored tarps to cover stockpiles at small-scale mining operations if there is a potential for contaminated stormwater to leave the site.
- Provide containment and or cover for any on-site storage areas to prevent run-on and discharge of suspended solids and other pollutants.

## **4.8.6 BMP A706: Swimming Pool and Spa Cleaning and Maintenance**

### **4.8.6.1 Description of Pollutant Sources**

This activity applies to all municipal and commercial swimming pools and spas, including Tacoma-Pierce County Health Department (TPCHD) regulated facilities. Pools and spas at hotels, motels, and apartment and condominium complexes are covered here. Pools at single-family residences are covered in Chapter 3 of this volume. Commercial pool and spa cleaning services must follow the required BMPs for all pools serviced.

Pollutants of concern include nutrients, suspended solids, chlorine, pH, and chemical oxygen demand (COD).

### **4.8.6.2 Required BMPs**

- The preferred method of pool or spa water disposal is to the sanitary sewer. If a sanitary sewer is available, all regulated facilities are required to connect for draining and backwash. Contact the City of Tacoma Source Control Unit at 253-591-5588 for specific instructions on allowable flow rates and timing before starting to drain the pool. Never discharge pool water to a septic system, as it may cause the system to fail.
- If discharge to the sanitary sewer is not possible, pool and spa water may be discharged to a ditch or storm drainage system, provided that the water has been dechlorinated first. The proponent is required to contact the City of Tacoma Source Control Unit at 253-591-5588 prior to discharge for instructions on allowable flow rates for the system or ditch that is being discharged to. All discharges shall be de-chlorinated to a concentration of 0.1 parts per million (ppm or mg/L) or less, and pH adjusted 6.5 to 8.5 standard units, if necessary. Neutralizing chemicals are available for dechlorinating water and adjusting the pH. Turbidity shall not exceed 10 NTU. Letting the pool or spa "sit" may also reduce chlorine levels. Use a test kit to determine if the chlorine concentration has reached zero and the pH is within acceptable limits.
- State law allows discharges of pool water to the ground, not to a water body or storm drainage system, with a chlorine level of up to 3 parts per million. However, the water must not cross property lines or impact neighboring properties, and a satisfactory means for distributing the water to the ground must be used so there is no runoff.
- Backwash from pool filters cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.
- Diatomaceous earth used in pool filters cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.

### **4.8.6.3 Recommended BMP**

- Hire a professional pool-draining service to collect all pool water for offsite disposal.



## **4.8.7 BMP A707: De-Icing and Anti-Icing Operations for Streets & Highways**

### **4.8.7.1 Description of Pollutant Sources**

Deicing and/or anti-icing compounds are used on highways, streets, and sidewalks to control ice and snow. Typically ethylene glycol and propylene glycol are deicers used on aircraft. Deicers commonly used on highways, streets and sidewalks include calcium magnesium acetate (CMA), calcium chloride, magnesium chloride, sodium chloride, urea, and potassium acetate. The deicing and anti-icing compounds become pollutants when they are conveyed to storm drains or to surface water after application. Leaks and spills of these chemicals can also occur during their handling and storage.

### **4.8.7.2 Required BMPs**

- Select de-icers and anti-icers that cause the least adverse environmental impact. Apply only as needed using minimum quantities.
- Where feasible and practicable, use roadway deicers, such as calcium magnesium acetate, potassium acetate, or similar materials that cause less adverse environmental impact than urea and sodium chloride.
- Store and transfer de/anti-icing materials on an impervious containment pad in accordance with BMP A401 Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products and A408 Storage of Liquids in Above-Ground Tanks.
- Sweep/clean up accumulated de/anti-icing materials and grit from roads as soon as possible after the road surface clears.

### **4.8.7.3 Recommended BMPs**

- Intensify roadway cleaning in early spring to help remove particulates from road surfaces.
- Include limits on toxic metals in the specifications for de/anti-icers.
- Additional guidance can be found in the Regional Road Maintenance - Endangered Species Act (ESA) program guidelines.
- State guidelines contain additional information for de-icing activities at airports.

## **4.8.8 BMP A708: Roof and Building Drains at Manufacturing and Commercial Buildings**

### **4.8.8.1 Description of Pollutant Sources**

Stormwater runoff from roofs and sides of manufacturing and commercial buildings can be sources of pollutants caused by leaching of roofing materials, building vents, and other air emission sources. Vapors and entrained liquid and solid droplets/particles have been identified as potential pollutants in roof/building runoff. Metals, solvents, acidic/alkaline pH, BOD, and organics are some of the pollutant constituents identified.

### **4.8.8.2 Required BMPs**

- Bare galvanized metal shall not be used for materials that convey stormwater, such as roofs, canopies, siding, gutters, downspouts, roof drains, and pipes. Any galvanized materials shall have an inert, non-leachable finish, such as a baked enamel, fluorocarbon paint (such as Kynar® or Hylar®), factory-applied epoxy, pure aluminum, or asphalt coating. Acrylic paint, polyester paint, field-applied, and part zinc (such as Galvalume®) coatings are not acceptable.
- If leachates and/or emissions from buildings are suspected sources of stormwater pollutants, these surfaces are considered pollution-generating impervious surfaces and may require treatment per Volume 1, Section 3.4.6 Minimum Requirements #6..
- If a roof/building stormwater pollutant source is identified, implement appropriate source control measures such as air pollution control equipment, selection of materials, operational changes, material recycle, process changes, etc.
- Water quality treatment BMPs are found in Volume 5 of this manual.

## **4.8.9 BMP A709: Urban Streets**

### **4.8.9.1 Description of Pollutant Sources**

Streets can be sources of vegetative debris, paper, fine dust, vehicle liquids, tire wear residues, heavy metals (lead and zinc), phthalates, soil particles, ice control salts, domestic wastes, animal wastes, lawn chemicals, and vehicle combustion by-products. Street surface contaminants have been found to contain significant concentrations of particle sizes less than 250 microns (Sartor and Boyd, 1972).

### **4.8.9.2 Required BMPs**

- Conduct efficient street sweeping where and when appropriate to minimize the contamination of stormwater. Do not wash street debris into storm drains.

### **4.8.9.3 Recommended BMPs**

- For maximum stormwater pollutant reductions on curbed streets and high volume parking lots, use efficient vacuum sweepers.
- High-efficiency street sweepers utilize strong vacuums and the mechanical action of main and gutter brooms combined with an air filtration system that only returns clean air to the atmosphere (i.e., filters very fine particulates). They sweep dry and use no water since they do not emit any dust.
- For moderate stormwater pollutant reductions on curbed streets, use regenerative air sweepers or tandem sweeping operations.
- A tandem sweeping operation involves a single pass of a mechanical sweeper followed immediately by a single pass of a vacuum sweeper or regenerative air sweeper.
  - A regenerative air sweeper blows air down on the pavement to entrain particles and uses a return vacuum to transport the material to the hopper.
  - These operations usually use water to control dust. This reduces their ability to pick up fine particulates.
- For minimal stormwater pollutant reductions on curbed streets, use mechanical sweepers.

**NOTE:** Mechanical sweepers are referred to as broom sweepers and use the mechanical action of main and gutter brooms to throw material on a conveyor belt that transports it to the hopper. These sweepers usually use water to control dust, reducing their ability to pick up fine particulates.

- Conduct sweeping at optimal frequencies. Optimal frequencies are those scheduled sweeping intervals that produce the most cost-effective annual reduction of pollutants normally found in stormwater and can vary depending on land use, traffic volume, and rainfall patterns.
- Train operators in those factors that result in optimal pollutant removal. These factors include sweeper speed, brush adjustment and rotation rate, sweeping pattern, maneuvering around parked vehicles, and interim storage and disposal methods.
- Minimize the amount of water applied for dust control to avoid washing pollutants into the storm drainage system.
- Street sweeping shall be performed prior to washing the street.
- Consider the use of periodic parking restrictions and public notification in residential areas to ensure the sweeper's ability to sweep along the curb.

- Establish procedures for prompt sweeping, removal, and disposal of spill clean-up materials and debris from special events that will generate higher than normal loadings.
- Disposal of street sweeping solids must comply with state solid waste regulations. Additional guidance can be found in the Regional Road Maintenance – Endangered Species Act (ESA) program guidelines.
- Inform citizens about the importance of eliminating yard debris, oil, and other wastes in street gutters in order to reduce street pollutant sources.
- When encountering questionable sweeping waste contact the City of Tacoma Source Control Unit at 253-591-5588 for guidance.

## **4.8.10 BMP A710: Railroad Yards**

### **4.8.10.1 Description of Pollutant Sources**

Pollutant sources can include drips/leaks of vehicle fluids and cargo onto the railroad bed; human waste disposal; litter; locomotive/railcar/equipment cleaning; fueling; outside material storage; the erosion and loss of soil particles from the railroad bed; maintenance and repair activities at railroad terminals, switching yards, and maintenance yards; and herbicides used for vegetation management. Waste materials can include waste oil, solvents, degreasers, antifreeze solutions, radiator flush, acids, brake fluids, dust, soiled rags, oil filters, sulfuric acid and battery sludges, machine chips with residual machining oil, and toxic fluids/solids lost during transit. Potential pollutants include oil and grease, TSS, BOD, organics, pesticides, and metals.

### **4.8.10.2 Required BMPs**

- Implement the applicable BMPs in this chapter depending on the pollutant generating activities/sources at a railroad yard facility.
- Do not allow toilets to discharge to outside areas while a train is in transit or at the station. Pumpout facilities shall be used to service train toilets.
- Use drip and track pans at hose/pipe connections during liquid transfer and other leak-prone areas.
- During maintenance do not discard debris or waste liquids along the tracks or in railroad yards.
- Promptly clean up all spilled materials.

In areas subject to leaks/spills of oils or other chemicals, convey the contaminated stormwater to appropriate treatment such as a CP or API oil/water separator for floating oils, or other appropriate treatment BMP (as approved by the City of Tacoma). See Volume 5. Prior to disposal, certain areas may require discharge to sanitary sewer.

## **4.8.11 BMP A712: Maintenance of Roadside Ditches and Culverts**

### **4.8.11.1 Description of Pollutant Sources**

Common road debris including litter, eroded soil, oils, vegetative particles, and heavy metals can be sources of stormwater pollutants.

### **4.8.11.2 Required BMPs**

- Inspect roadside ditches and culverts regularly, as needed, to identify sediment accumulations and localized erosion.
- Clean ditches and culverts on a regular basis, as needed. Ditches shall be kept free of rubbish and debris.
- Vegetation in ditches often prevents erosion and cleanses runoff waters. Remove vegetation only when flow is blocked or excess sediments have accumulated. Conduct ditch maintenance (seeding and harvesting) in late spring and/or early fall, where possible. Consider leaving segments of undisturbed vegetation to provide natural filtration.
- In the area between the edge of the pavement and the bottom of the ditch, commonly known as the “bare earth zone,” use grass vegetation, wherever possible. Vegetation shall be established from the edge of the pavement if possible, or at least from the top of the slope of the ditch.
- Diversion ditches on top of cut slopes that are constructed to prevent slope erosion by intercepting surface drainage must be maintained to retain their diversion shape and capability.
- Ditch cleanings are not to be left on the roadway surfaces. Promptly sweep dirt and debris remaining on the pavement as needed and at the completion of ditch cleaning operations.
- Roadside ditch cleanings not contaminated by spills or other releases and not associated with a stormwater treatment system such as a bioswale may be screened to remove litter and separated into soil and vegetative matter (leaves, grass, needles, branches, etc.). The soil fraction may be handled as ‘clean soils’ and the vegetative matter can be composted or disposed of in a municipal waste landfill.
- Roadside ditch cleanings contaminated by spills or other releases known or suspected to contain dangerous waste must be handled following the Dangerous Waste Regulations (Chapter 173-303 WAC) unless testing determines it is not dangerous waste. Specific cleanup standards are set forth in the Model Toxics Control Act (Chapter 70.105D RCW) and Regulations (Chapter 173-340 WAC).
- Inspect culverts on a regular basis for scour or sedimentation at the inlet and outlet, and repair as necessary. Give priority to those culverts conveying perennial and/or salmon-bearing streams and culverts near streams in areas of high sediment load, such as those near subdivisions during construction.
- Street waste shall be disposed of in accordance with Volume 4, Appendix D.

**4.8.11.3 Recommended BMPs**

- Install biofiltration swales and filter strips to treat roadside runoff wherever practicable and use engineered topsoils wherever necessary to maintain adequate vegetation. These systems can improve infiltration and stormwater pollutant control upstream of roadside ditches. Refer to Volume 5 of this manual for additional information about biofiltration swales and filter strips.
- Additional guidance can be found in the Regional Road Maintenance - Endangered Species Act (ESA) program guidelines.

## **4.8.12 BMP A714: Spills of Oil and Hazardous Substances**

### **4.8.12.1 Description of Pollutant Sources**

Owners or operators of facilities engaged in drilling, producing, handling, gathering, storing, processing, transferring, distributing, refining or consuming oil and/or oil products are required by Federal Law to have a Spill Prevention and Control Plan. The federal definition of oil is oil of any kind or any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. Specific regulations can be found in 40 CFR Part 112. These regulations are administered by the Environmental Protection Agency and the United States Coast Guard. Large petroleum handling facilities and vessels are also subject to regulations contained in Chapter 90.56 RCW and Chapter 173-180A WAC.

Owners of businesses that produce Dangerous Wastes are also required by State Law, Chapter 70.105 RCW and Chapter 173-303 WAC, to have a spill control plan. These businesses should refer to Chapter 5 of this volume. The City of Tacoma may also require a spill plan to protect the municipal sewer system and groundwater resources. Plans required by the above listed regulations may suffice.

### **4.8.12.2 Required BMPs**

- Prepare an Emergency Spill Control Plan (SCP), which includes:
  - A description of the facility including the owner's name and address.
  - The nature of the activity at the facility.
  - The general types of chemicals used or stored at the facility.
  - A site plan showing the location of storage areas for chemicals, the locations of storm and sanitary drains, the areas draining to them, the ultimate point of discharge, and the location and description of any devices to stop spills from leaving the site such as positive control valves;
  - Cleanup procedures and supplies.
  - Notification procedures to be used in the event of a spill, such as notifying key personnel. Agencies such as Ecology, Tacoma Fire Department, Washington State Patrol, City of Tacoma, U.S. Coast Guard, and the U.S. Environmental Protection Agency shall be notified.
  - The name and 24-hour contact telephone number of the designated person, and their alternate with overall spill cleanup and notification responsibility.
  - Identify contractors that can be contacted to provide spill clean-up and disposal services. A service agreement is encouraged.
- Train key personnel in the implementation of the Emergency SCP. Prepare a summary of the plan and post it at appropriate points in the building, identifying the spill cleanup coordinators, location of cleanup kits, and 24-hour phone numbers of regulatory agencies to be contacted in the event of a spill.
- Update the SCP regularly.
- Immediately notify Ecology and the City of Tacoma if a spill may reach sanitary or storm sewers, groundwater, or surface water, in accordance with federal and Ecology spill reporting requirements.



- Immediately clean up spills using appropriate personal protection equipment and following the facility safety standards. Do not use emulsifiers for cleanup unless an appropriate disposal method for the resulting oily wastewater is implemented. Absorbent material shall not be washed down a floor drain or storm sewer.
- Locate emergency spill containment and cleanup kit(s) in high potential spill areas. The contents of the kit shall be appropriate for the type and quantities of chemical liquids stored at the facility.

#### **4.8.12.3 Recommended BMPs**

- Spill kits should include appropriately lined drums, absorbent pads, and granular or powdered materials for neutralizing acids or alkaline liquids where applicable. In fueling areas: absorbent should be packaged in small bags for easy use and small drums should be available for storage of absorbent and/or used absorbent. Spill kits should be deployed in a manner that allows rapid access and use by employees.
- Example spill plans may be obtained from the Washington State Department of Transportation, the Environmental Protection Agency, and the City of Tacoma Source Control Unit.

#### **4.8.12.4 Additional Links**

- Washington State Department of Ecology, FOCUS: Small Spill Cleanup Guide  
<http://www.ecy.wa.gov/biblio/0308005.html>
- Washington State Department of Ecology, Hazmat Spill Contractor List:  
[http://www.ecy.wa.gov/programs/spills/response/hazmat\\_spill\\_contractor\\_list.pdf](http://www.ecy.wa.gov/programs/spills/response/hazmat_spill_contractor_list.pdf)
- Washington State Department of Ecology, Spill Reporting, 24/7 Numbers:  
<http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm>
- Washington State Department of Ecology, Incident Command System and National Incident Management System  
<http://www.ecy.wa.gov/programs/spills/preparedness/Drills/ics.html>
- Washington State Department of Transportation, Spill Prevention Control and Countermeasures (SPCC)  
<http://www.wsdot.wa.gov/Environment/HazMat/SpillPrevention.htm>
- Environmental Protection Agency, Spill Prevention, Control and Countermeasure (SPCC)  
<http://www.epa.gov/oem/content/spcc/index.htm>
- Washington State Legislature, WAC 173-303-145 Spills and Discharges into the Environment  
<http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-145>

### **4.8.13 BMP A715: Water Reservoir, Transmission Mainline, Wellhead, and Hydrant Flushing Activities**

#### **4.8.13.1 Description of Pollutant Sources**

Construction and operation of drinking water infrastructure, as well as emergency response activities, can generate sediments, rust, turbidity and suspended solids, bacteria, and chlorinated water. Flushing of the water delivery system is necessary to maintain drinking water quality and ensure public health. Flushing activities can result in increased flows in downstream conveyances. These high flows may cause flooding and create erosion in downstream channels.

#### **4.8.13.2 Required BMPs**

- Discharges of untreated hyperchlorinated water must go to the sanitary sewer. Prior approval is required.
- Alternatively, non-emergency discharges of de-chlorinated potable water such as hydrant flushing may go to the storm drainage system at prior approved flow rates provided the following limits are met:
  - Chlorine residual 0.1 ppm
  - pH 6.5 – 8.5
  - Turbidity 10 NTU

Coordinate with the City of Tacoma Sewer Transmission section at 253-591-5585. The receiving storm pipe shall be monitored for the duration of the discharge.

- Evaluation of the receiving conveyance system for capacity and/or obstructions may be required.
- A Special Approved Discharge Authorization may be required for draining and flushing reservoirs, standpipes, wellheads, and transmission lines. Notification, monitoring, reporting, flow control measures, and other special conditions may apply. Contact the City of Tacoma Source Control Unit at 253-591-5588 for their requirements.
- Significant releases of water can have a detrimental effect on the storm and sanitary transmission system as well as receiving waters. Notification of these releases must be promptly made to Environmental Services by calling the 24-hour Operations Center at 253-591-5595.

#### **4.8.13.3 Recommended BMPs**

- During emergency repairs and activities, such as mainline breaks, erosion control measures shall be taken as practicable. Use of sandbags, check dams, plastic sheeting, pumps, and other erosion control measures should be employed to minimize erosion as much as possible.
- Excavation de-watering should be managed to minimize downstream environmental impacts. Use of vac-trucks, diverting flow to grassy areas, filter bags, and retention ponds should be employed.

#### **4.8.14 BMP S101: Eliminate Illicit Storm Drainage System Connections**

A common problem found in the storm drain system for Tacoma is illegal hook-ups to the system. Conversely, discharging clean, uncontaminated water to the sanitary sewer system is also prohibited.

All businesses and residences in Tacoma shall examine their plumbing systems to determine if illicit connections exist. Any time it is found that toilets, sinks, appliances, showers and bathtubs, floor drains, industrial process waters, cooling towers, or other indoor activities are connected to the storm drainage system, the connections must be immediately rerouted to the sanitary or septic system, holding tanks, or process treatment system. Exceptions to this requirement would be those industries and businesses that have been issued an NPDES Permit by Ecology, and are allowed specific discharges under that permit. Please refer to Chapter 5 to determine if a specific type of business is required to have a NPDES permit.

Dye testing with a non-toxic dye, smoke testing, electronic locators, and television inspection equipment can help to determine where a pipe or structure drains if it is not obvious by observations or on plans. Contact the City of Tacoma Source Control Unit at 253-591-5588 for assistance in locating City structures adjacent to a property.

Drains which are found to be connected to the wrong system must either be permanently plugged or disconnected and rerouted as soon as possible. Permits must be obtained from The City of Tacoma (253-591-5030) to reroute drains. If the discharge is anything other than domestic, then a holding tank or on-site treatment may be necessary. Contact the City of Tacoma Source Control Unit at 253-591-5588 for assistance.

#### **4.8.15 BMP S102: Dispose of Contaminated Stormwater and Waste Materials Properly**

Every business and residence in Tacoma must dispose of solid and liquid wastes and contaminated stormwater properly. There are generally four options for disposal depending on the type of materials. These options include:

- Sanitary sewer and septic systems
- Recycling facilities
- Municipal or private, permitted solid waste disposal facilities
- Permitted hazardous waste treatment, storage, and disposal facilities

Many liquid wastes and contaminated stormwater (depending on the pollutants and associated concentrations present) can be put into the sanitary sewer. Animal wastes can also be disposed of in a sanitary sewer. A City permit may be required for discharges to the sanitary sewer system. Please contact Building and Land Use Services at 253-591-5030 and the Source Control Unit at 253-591-5588 for design and permit requirements. See Appendix D for Street Waste Management Requirements.

If wastes cannot be legally discharged to a sanitary sewer or septic system, one of the other three disposal options must be used. Recycling facilities are a recommended option for many commercial and household items, including used oils, used batteries, old equipment, glass, some plastics, metal scrap materials, solvents, paints, wood and land clearing wastes, and various other solid wastes.

Solid wastes that cannot be recycled and that are not hazardous must be disposed of at a licensed municipal solid waste disposal facility. Dangerous and hazardous wastes must be properly transported to an appropriate hazardous waste treatment, storage, and disposal facility. The City of Tacoma Solid Waste Section at 253-591-5543 can provide information on waste disposal options.

Maintain records for all materials that are recycled or disposed.

Appendix A of this volume has a list of telephone numbers to contact for assistance.

#### **4.8.16 BMP S103: Discharge Process Wastewater to a Sanitary Sewer, Holding Tank, or Water Treatment System**

This BMP is a minimum requirement for all industrial and commercial activities that generate contaminated process wastewater, such as washing activities, composting activities, and production and processing activities. The water used in these activities shall not drain to surface waters or groundwater untreated. Process water must drain to a sanitary sewer, holding tank, on-site treatment system, wastewater treatment system, or be recycled.

In order to connect to the sanitary sewer, contact Tacoma Building and Land Use Services at 253-591-5030 for information on sanitary sewer connection permits. Call the City of Tacoma Source Control Unit at 253-591-5588 for pretreatment and permit information.

If a sanitary sewer is not available, the only remaining options are holding tanks or an on-site wastewater treatment facility.

The contents of the holding tank must be pumped out or drained before the tank is full and disposed of properly (see BMP S102).

If the on-site wastewater treatment facility option is taken, then it must be designed to receive and effectively treat all discharges of process water from the business. The Washington State Department of Ecology must be contacted for approval of such a facility.

If the activity is to remain uncovered, then define a designated area for the activity and provide a mechanism for prevention of stormwater run-on into the activity area. (e.g. a curb, dike, or berm). The designated area shall be paved and sloped to a central collection drain and be connected to the sanitary sewer, (with pretreatment if required), the on-site holding tank, or the on-site treatment facility, whichever method is selected.

Monitoring and maintaining all collection systems and keeping records of inspections and maintenance may be required.

#### **4.8.17 BMP S108: Implement Integrated Pest Management Measures**

Use of herbicides, fungicides, and rodenticides should always be done with extreme caution, not only because of the potential harm to humans and pets, but also because of the potential harm to fish, wildlife, and our water resources. In light of the toxic nature of these compounds, special attention should be given to pesticide usage in all applications. The discussion below applies more to large-scale licensed pesticide users, but should be considered for backyard applications as well.

Commercial, agricultural, municipal, and other large scale pesticide users, such as golf courses and parks, should adhere to the principles of integrated pest management (IPM), a decision-making process for pest management that strives for intelligent, environmentally sound control of pests. It is a systems approach to pest management that combines agronomic, biological, chemical, and genetic information for educated decisions on the type of control to use, the timing and extent of chemical application, and whether non-chemical means can attain an acceptable level of pest control.

IPM is a preventive measure aimed at knowing the exact pests being targeted for control, the locations and times when pests will pose problems, the level of pest-induced damage that can be tolerated without taking action, the most vulnerable life stage, and control actions that are least damaging to the environment. The major components of IPM are as follows:

- Monitoring and inventory of pest populations
- Determination of pest-induced injury and action levels
- Identification of priority pest problems
- Selection and timing of least toxic management tools
- Site-specific treatment with minimized chemical use
- Evaluation and adjustment of pesticide applications

Monitoring of pest populations is a key to successful IPM implementation. Pest problems are universally easier to control if the problem can be discovered early. With IPM, pesticides are used only as a last resort. Maximization of natural controls, including biological controls and removal of pests by hand, is always the first choice.

Additional concerns are storage, equipment clean-up, spill protocols, and waste disposal.

More information on IPM is available from the Washington State Department of Agriculture and from the Washington State University Extension Service, or in Appendix C of this volume.

#### **4.8.18 BMP S109: Cleaning Catch Basins**

Cleaning catch basins regularly is one of the most important stormwater source control measures that a business can take. Catch basins are typically located at low spots in parking lots, along curbs and road edges, and where storm drain pipes combine flows. Catch basins collect surface runoff for storm drains that are typically located directly underneath them. Most catch basins have sumps. The sump is intended to trap sediments, debris, and other particles that can settle out of stormwater. All of the solids and stagnant water collected from catch basin sumps must be disposed of properly. The sump contents shall not be flushed into the catch basin outflow pipe.

For additional information on the maintenance of catch basins, refer to Volume 1, Appendix D. Perform regular inspections of the basins and their grates. Repair broken grates and catch basin structures. Remove trash and collected sediment when 60% of the sump depth has been filled or sediments are within 6 inches of the bottom of the outlet pipe, or if there is evidence of contaminants including oil and grease.

It should be apparent that the use of other BMPs, such as frequent sweeping of activity areas, covering activity areas, reducing activity occurrence, and containing run-off from activity areas will help reduce catch basin cleaning frequency, thus saving time and money. All businesses and agencies should set up maintenance schedules for all of their BMPs so coordinated BMP maintenance efforts results in reduced catch basin cleaning frequencies.

Use of catch basin inserts such as filter socks, absorbent pillows, and filter baskets require an increased inspection frequency to prevent plugging and flooding.

For a list of cleaning and sweeping services, go to [www.cityoftacoma.org/stormwater](http://www.cityoftacoma.org/stormwater).

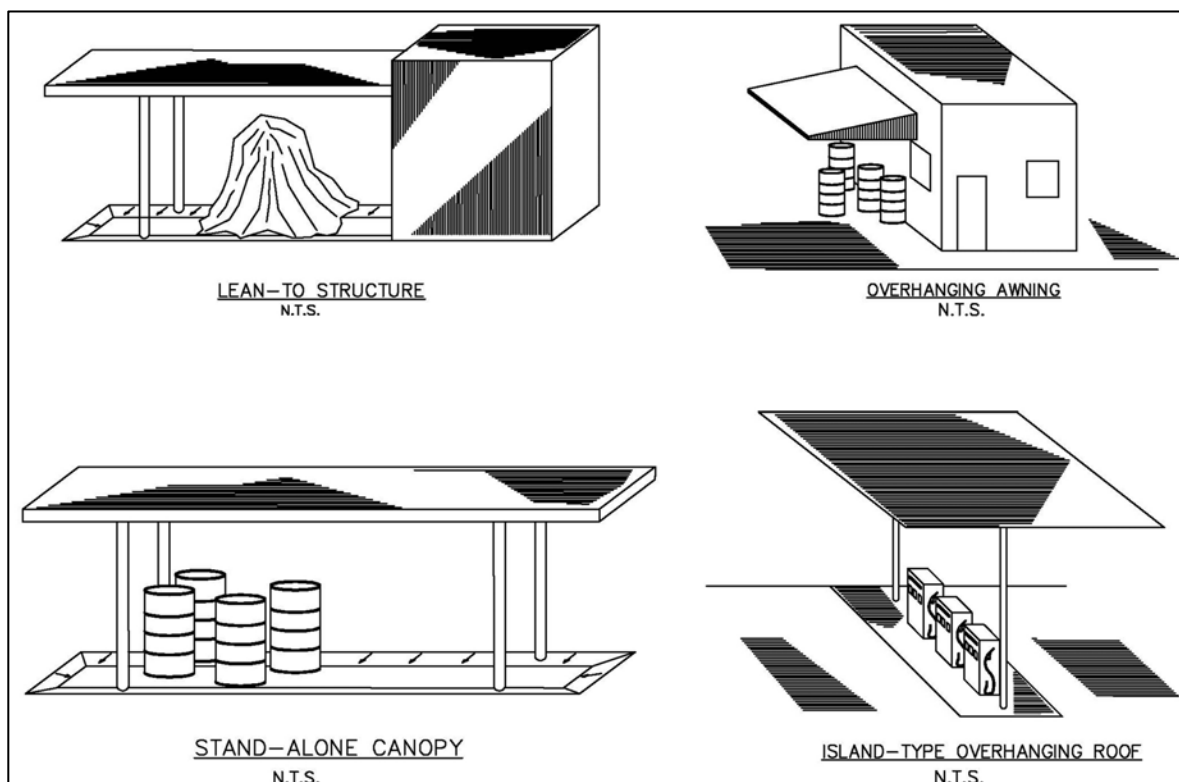
Dispose of street waste in accordance with Appendix D of this volume.

## 4.9 Cover and Surround Activities

### 4.9.1 BMP S104: Cover the Activity with a Roof or Awning

In many cases, a simple roof or awning will protect the activity from coming into contact with stormwater, and usually at a lower cost than a complete building. These structures require building permits to construct. Contact the Tacoma Building and Land Use Services Division at 253-591-5030 to obtain permits.

The area of the roof cover shall be sufficient to prevent any precipitation from reaching the covered materials. Provisions shall be made to prevent stormwater run-on into the covered area. The installation of sumps or sanitary sewer drains may also be necessary. Roof drains shall discharge outside and be directed away from the covered area. Examples of these types of structures are shown in Figure 4 - 15.



**Figure 4 - 15. Examples of Covered Activities**



#### 4.9.2 BMP S105: Cover the Activity with an Anchored Tarp or Plastic Sheet

Some activities, such as stockpiling of raw materials, can be effectively covered with a sturdy tarp or heavy plastic sheet made of impermeable material. Weights such as bricks, tires, or sandbags should be used to anchor the cover in place. Run-on shall be prevented from reaching the activity or material. Stormwater run-off from the cover shall be directed away from the stockpile and work zone, and if uncontaminated, directed to the stormwater collection system. The tarp must be inspected daily to ensure that no holes or gaps are present in the tarp coverage. An example of this type of cover is shown in Figure 4 - 16.

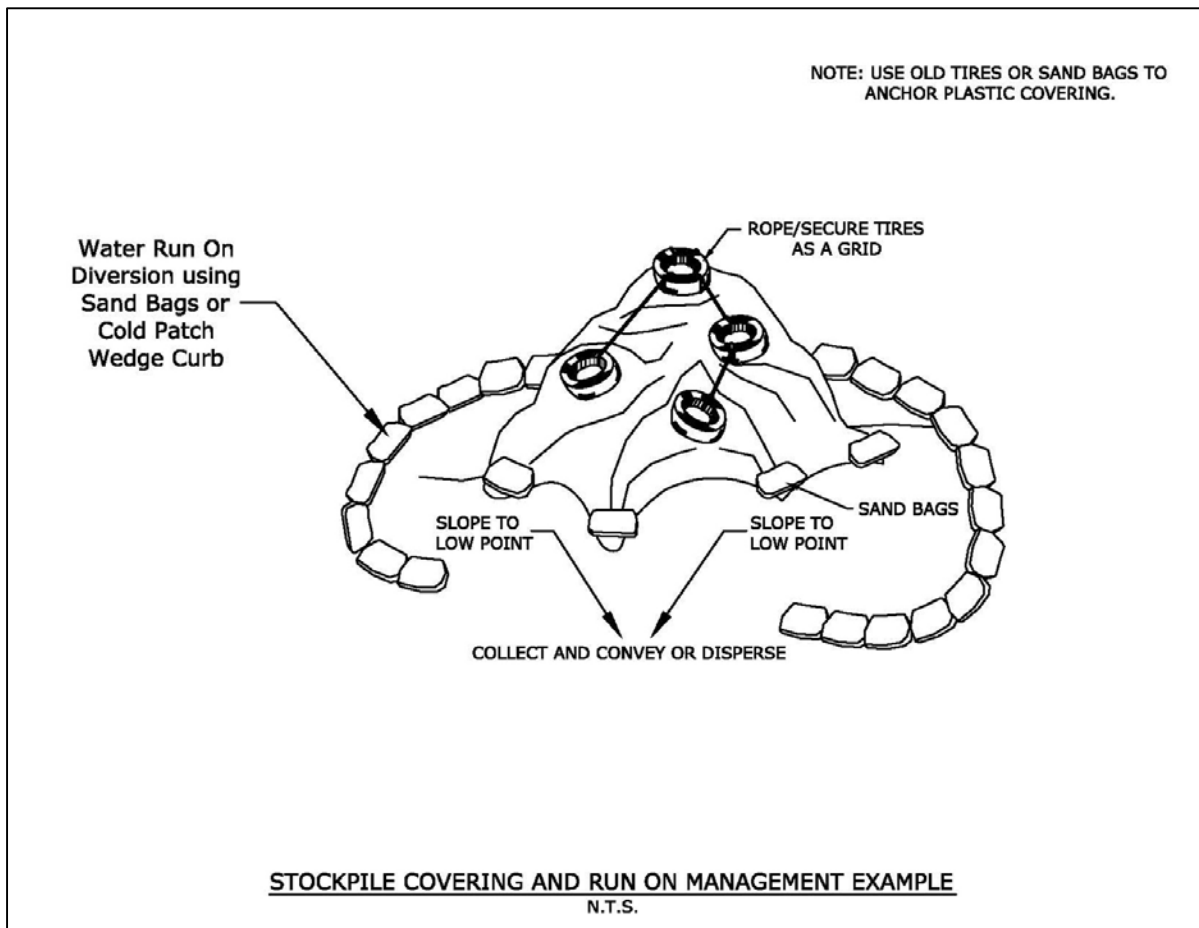
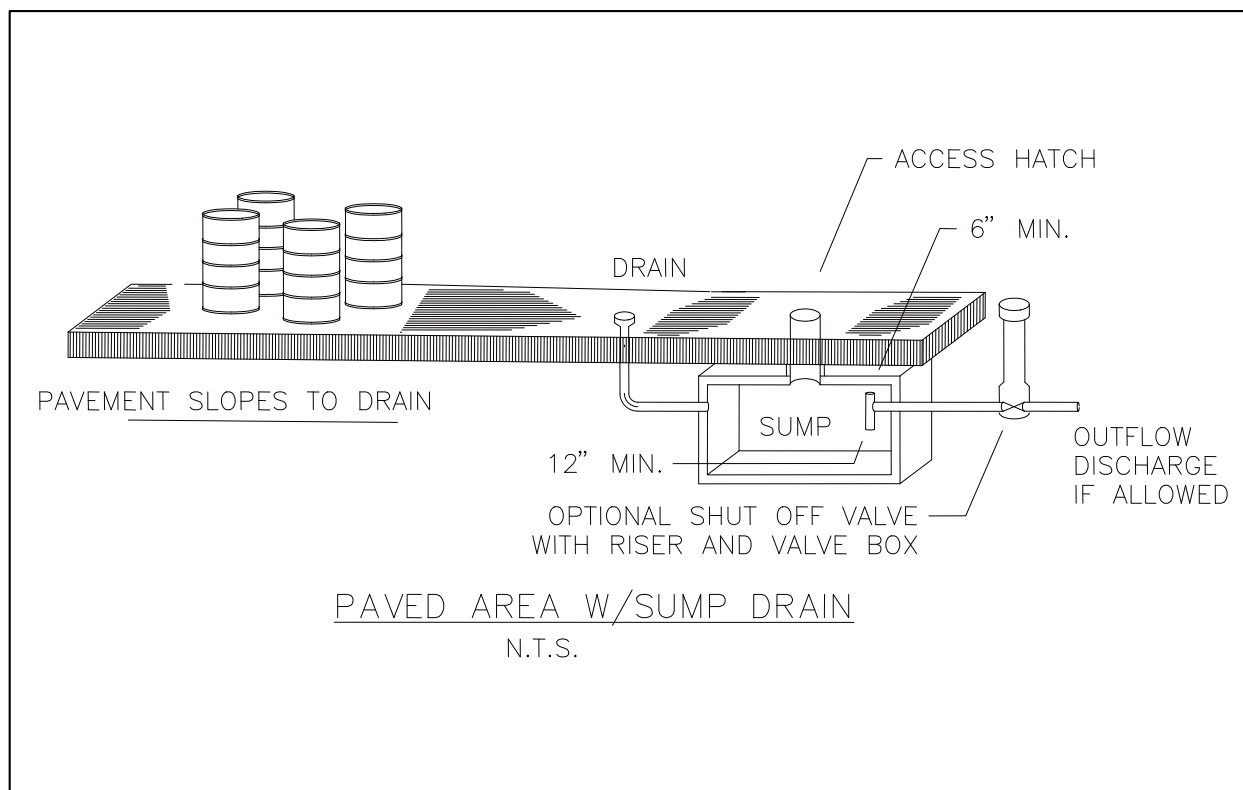


Figure 4 - 16. Tarp Covering

### 4.9.3 BMP S106: Pave the Activity Area and Slope to a Sump, Holding Tank, or Oil/Water Separator

This BMP applies to several activities that cannot be covered effectively. It is particularly suited to activities with the potential for leaks and spills, but that otherwise do not generate excessive amounts of polluted runoff. The activity area shall be paved and sloped to a central collection point. A sump, holding tank, or oil/water separator (Figure 4 - 17) serves to provide spill containment until the liquids can be pumped out and properly disposed. The minimum volume for the sump shall be equivalent to the volume generated by the anticipated activity plus rain water. Sizing justification shall be included in design submittals.

To prevent run-on, the area should be enclosed with a berm, curb, or dike. Frequent inspections of the sump, holding tank, or oil/water separator are necessary. Inspections and maintenance shall be recorded in a log. Commercial services that pump sumps and holding tanks are listed in the Yellow Pages of the phone directory under Environmental and Ecological Services.



**Figure 4 - 17. Paved Area with Sump Drain**

#### **4.9.4 BMP S107: Surround the Activity Area with a Curb, Dike, or Berm or Elevate the Activity**

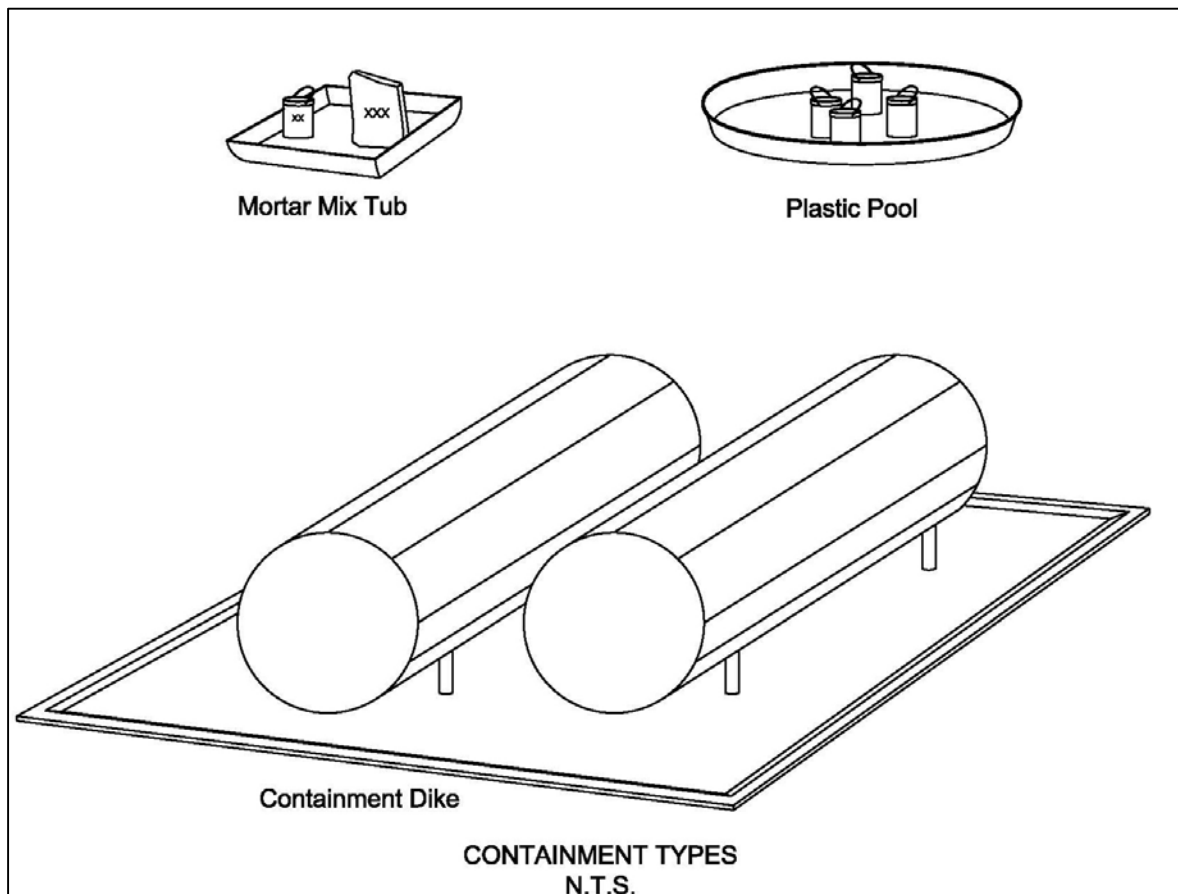
This set of BMP options can be an effective means for prevention of stormwater run-on to an activity area. In addition, a curb, berm, or dike can be used for containment of spills in the activity area, or for containment of contaminated activity runoff. Generally, a containment BMP is most applicable to spill control situations; that is, sites where runoff is relatively clean, but occasional spills may occur.

If a curb, berm, or dike is used for runoff containment, and other containment sizing regulations (such as fire codes, Environmental Protection Agency, Department of Ecology or Tacoma-Pierce County Health Department restrictions) do not apply, the containment volume shall be 100% of the volume of the largest tank plus the volume of stormwater runoff from rain events up to the 25-year, 24-hour storm within the containment area is contained or 110% of the volume of the largest tank, whichever is greater.

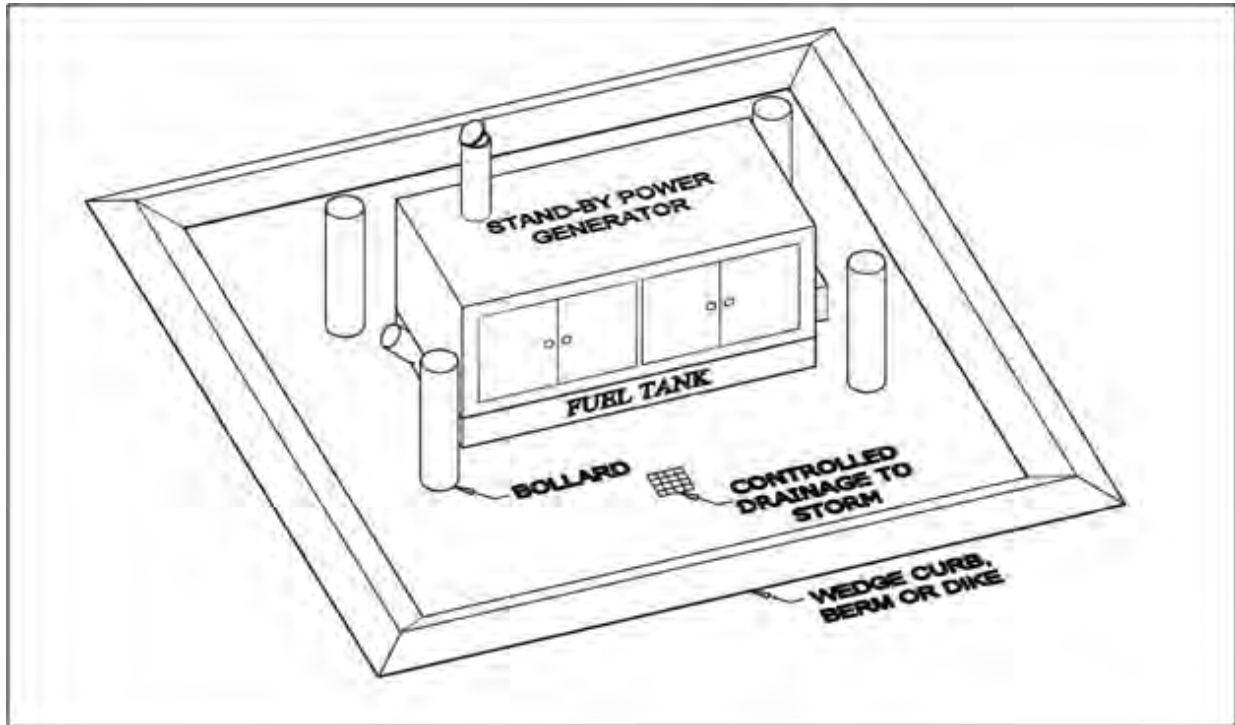
Impervious containment may consist of membrane lined soil enclosures, containment pallets, plastic pools, mortar mixing tubs, and water troughs.

Regular inspections of the containment area and proper management of any collected stormwater is required.

Development of a spill plan may be necessary for storage of liquids. See BMP A714. For permanent storage facilities see BMP A202, A401, A407, and A408.



**Figure 4 - 18. Containment Types**



**Figure 4 - 19. Standby Generator**