



Clark County Stormwater Pollution Control Manual

Best Management Practices
for Businesses and Government Agencies

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Prepared by:

Clark County Clean Water Program

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FOREWORD

The intent of the National Pollutant Discharge Elimination System (NPDES) program and Clark County is to maintain and improve the quality and beneficial uses of our water resources. The widespread implementation of best management practices is regarded as one of the best solutions to achieving this goal. This manual provides detailed information for businesses, public facilities, and other nonresidential entities in unincorporated Clark County on the actions we are all required to take to reduce the contamination of stormwater, surface water, and groundwater.

ACKNOWLEDGEMENTS

This manual is based on a manual created by King County, Washington.

The King County Manual was published in 1995 and was the result of a two-year public involvement process. Sandra Kilroy, with the King County Surface Water Management Division, was project manager.

READER'S NOTE

Chapter 1 – Overview and Chapter 3 – Stormwater Best Management Practices for Specific Activities are the most important chapters of this manual.

Chapters 2, 4, 5, and 6 provide supporting material with information on water quality problems, best management practices, other agency regulations of interest, and references and phone numbers for technical and financial assistance.

READ CHAPTER 1 TO...

Determine if you are covered by this manual.

Find the step-by-step instructions for working through the implementation of best management practices.

Locate and complete the Activity Worksheet which identifies which of the Activity Sheets in Chapter 3 you should review.

CLARIFICATION OF MANUALS

This Stormwater Pollution Control Manual presents pollution prevention practices for existing activities in unincorporated Clark County. For most construction projects that require Clark County permits, stormwater quantity and quality control requirements are covered in the Clark County Stormwater and Erosion Control Ordinance.

Chapter 1 - Overview

Describes what is expected of you as a business/agency owner or manager and provides a beginning point on the use of this manual.

Chapter 2 - Stormwater Problems: Your Role

Provides information on how water becomes polluted and the effects of pollutants on water quality.

Chapter 3 - Stormwater Best Management Practices for Specific Activities

Describes stormwater best management practices that are required for various business and nonresidential activities.

Chapter 4 - BMP Information Sheets

Provides detailed information on how to implement many stormwater best management practices.

Chapter 5 - Other Agency Requirements

Provides information on regulations from other agencies that may apply to your activities.

Chapter 6 - Technical and Financial Assistance

Provides information on other programs or services that can help you implement the stormwater best management practices.

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About this Manual

Clark County's water resources—its streams, lakes, wetlands, and groundwater—play an important role in the quality of life we enjoy. They provide us recreation and drinking water, support wildlife and salmon, and are used by industry. These waters, however, are vulnerable to pollution from a wide variety of human activities.

This manual provides detailed information on what we are all required to do to reduce the contamination of surface water, groundwater, and stormwater to protect our quality of life.

Many of our water pollution problems are due in large part to pollutants that are washed off from land by storms. The quality of “stormwater” from public facilities, commercial and industrial businesses, and agricultural lands is a major concern nationwide. Many people believe that stormwater is “clean” and does not harm water quality. This perception is understandable since the amount of pollution from any one spot is not usually significant by itself. But when all these small amounts are combined, they can cause big water quality problems.

The federal Clean Water Act mandates that cities and counties control the quality of stormwater runoff. One way to achieve this requirement is to implement pollution prevention measures on individual properties. To meet the requirements of the Clean Water Act and to sustain our quality of life, the Clark County Board of Commissioners passed Chapter 13.26 of the Clark County Code in November 1998, which was subsequently replaced with Chapter 13.26A.

Clark County code makes it unlawful to directly or indirectly discharge contaminants into the storm drainage system, surface water or groundwater and requires the development of this manual to assist people in preventing contaminated discharges.

This manual applies to those commercial, industrial, governmental, and agricultural activities in unincorporated Clark County that have the potential to contribute pollutants to stormwater runoff or directly to receiving waters (single-family residential activities are covered in separate educational materials). Stormwater runoff from these areas may seep into the ground, drain to a storm sewer or a drainage ditch, or flow over the ground. Regardless of the way runoff leaves the site, it ends up in a stream, lake, wetland or groundwater.

Contaminated stormwater can negatively affect every water body it enters. Therefore, this manual provides detailed information on what we are all required to do to reduce the contamination of surface water, groundwater, and stormwater from our properties. It shows that we are all doing our part to protect our quality of life.

Contaminated stormwater can negatively affect every water body it enters.

Chapter 1 describes what is expected of you as a business/agency owner or manager and provides a beginning point on the use of this manual.

Chapter 2 provides information on how water becomes polluted and the effects of pollutants on water quality.

Chapter 3 describes stormwater best management practices that are required for various business and nonresidential activities.

Chapter 4 provides detailed information on how to implement many stormwater best management practices.

Chapter 5 provides information on regulations from other agencies that may apply to your activities.

Chapter 6 provides information on other programs or services that can provide assistance in implementing the stormwater best management practices.

Best Management Practices: What Are They?

The methods of improving stormwater quality, and thus surface water and groundwater, are called *best management practices (BMPs)*. BMPs encompass a variety of managerial, operational, and structural measures that will reduce the amount of contaminants in stormwater and improve the quality of our water resources.

The goal of Clark County's program is to reduce the contamination of water resources through emphasis on source-control BMPs.

BMPs are separated into two broad categories: *source control* and *treatment*. As the name implies, *source-control BMPs* prevent contaminants from entering water bodies or stormwater runoff. Some source-control BMPs are operational, such as checking regularly for leaks and drips, and educating employees about site clean-up procedures. Other *source-control BMPs* require use of a structure to prevent rainwater from washing away materials that will contaminate stormwater runoff. Examples of these BMPs include a covered area or berm to prevent clean stormwater from entering work areas.

In contrast, *treatment BMPs* are structures that treat the stormwater to remove the contaminants. Most treatment BMPs require elaborate planning, design and construction. No treatment BMP is capable of removing 100 percent of the contaminants in stormwater.

The goal of Clark County's program is to reduce the contamination of water resources through emphasis on source-control BMPs because these are very effective and relatively inexpensive.

Who is This Manual for?

This manual applies to all businesses and other nonresidential entities in **unincorporated** Clark County. It is intended to cover every activity considered to have the potential to contaminate surface, storm, or groundwater. Anyone involved in a particular activity, whether as an employee, supervisor, manager, or landlord, must take part in implementing the appropriate BMPs selected from this manual.

Note: New development activities and significant redevelopment of a site are subject to other stormwater management requirements set forth in the Clark County Code including Chapter 40.380 Stormwater and Erosion Control, Chapter 40.450 Wetland Protection, and Chapter 40.440 Habitat Conservation..

Exemptions from This Manual

If you are already implementing BMPs according to another federal or state program you do not have to implement the BMPs in this manual. In addition, people who are voluntarily implementing BMPs may also be exempt. ***You are exempt if you***

- Are engaged in commercial agriculture and implementing and maintaining BMPs required by the Habitat Conservation Ordinance, Chapter 40.440, or another resource management program.
- Are a public facility implementing BMPs in compliance with the stormwater management program of the County's NPDES municipal stormwater permit.
- Are engaged in forest practices, with the exception of Class IV general forest practices.
- Are conducting normal residential activities at property containing a single detached home, duplex or triplex.
- Are voluntarily implementing other BMPs, which are equivalent measures, methods, or practices to the BMPs in this manual (contact the Clean Water Program at (360) 397-6118, ext. 4392 for information on determining equivalency).

Please understand that these exemptions are only from the requirements of this manual. If you are exempted for one or more of the reasons listed above, the County assumes that you are implementing the appropriate BMPs. If the County finds that you have not implemented BMPs, or that the BMPs that you have implemented are not effectively addressing the discharge of contaminants, then you may be required to comply with this manual. Everyone must implement BMPs, but how each individual goes about it, and through what program, may differ from one situation to the next. The following is a step-by-step approach to comply with the BMP requirements.

Also, an exemption from the BMP requirements does not exempt you from the requirement to not discharge contaminants to stormwater, surface water, or groundwater under Chapter 13.26A Clark County Code.

Step by Step Approach

Step 1 - Determine Your Status

Determine if you are obligated to comply with the BMPs by checking the list of exemptions in this chapter. If you are not exempt, then you must comply with the BMPs in this manual.

Step 2 - Complete the Enclosed Activity Work Sheet

This work sheet (located at the back of this chapter) will aid you in identifying the activities you conduct at your property, which may result in the contamination of stormwater. Take your time to complete the work sheet. The title of each activity is general and it may not be obvious at first glance that your activity fits under one of the titles.

Step 3 - Obtain BMP Activity Sheets

After completing the work sheet you need to obtain the information regarding which BMPs to implement. The activities you checked on the work sheet will refer you to the appropriate BMPs for those activities. This information can be found on the one-page activity sheets in Chapter three of this manual. If you do not have these activity sheets, there are three options for obtaining them:

1. Mail a photocopy of your completed work sheet, with your name and address to:

*Clark County Public Works
PO Box 9810
Clean Water Program
Vancouver, WA 98666*

We will send you the activity sheets you request.

2. Call the Clark County Clean Water Program at (360) 397-6118, ext. 4392, and we will mail you the activity sheets you request.
3. Check the county web site at www.clark.wa.gov.

Step 4 - Review Activity Sheets

Once you have obtained the activity sheets, review them carefully. You will need to implement the required BMPs listed on the activity sheets for each of the activities you marked on the work sheet. If you are already implementing effective pollution control practices for a particular activity, you should determine if there are additional measures to incorporate based on the activity sheets. If the activity sheets give you some flexibility in selection of BMPs, make sure you think through how to best implement BMPs for protecting runoff from pollution.

Step 5 - Evaluate Existing Conditions

Once you have determined the activities of concern and have reviewed the activity sheets, evaluate whether you have any practices or measures already in place that protect water quality from pollutants generated by the activities.

In addition, you will need to gain familiarity with the stormwater drainage patterns and system on your site. To control stormwater pollution, it is important to understand your drainage system. Use the site plan graph paper (in the back of this chapter) to sketch out the location of your site's drainage system. This will help you locate storage and activity areas in order to reduce flooding on your site and minimize the chance of spills or discharges to the system.

Step 6 - Seek Assistance

At this point or at any time during this process you can request a free on-site consultation from the Clean Water Program. Water quality specialists are available to walk through your site discussing existing site conditions and necessary BMPs and providing assistance with implementation. To request an on-site consultation contact: The Clean Water Program at (360) 397-6118, ext. 4392.

Step 7 - Check Your Internal Floor Drains and Plumbing System Connections

A common situation that can cause severe stormwater pollution problems is nonstormwater discharges to the storm drainage system. Examples are discharges from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges should be going to the sanitary sewer system, a holding tank, an on-site process water treatment system, or a septic system. You must correct these illicit discharges. If you have any question as to whether your discharge is allowable, contact the Clark County Clean Water Program at (360) 397-6118, ext.4392.

For information on how to check for illicit connections, see BMP Information Sheet 1 in Chapter 4. You can also ask for help from your local sewer utility. If you find out that your internal drains are improperly connected to the storm drainage system, they will need to be removed, permanently plugged, or connected to the sanitary sewer, septic system, on-site treatment system, or a holding tank.

Step 8 - Develop an Implementation Strategy

Look at your property as a whole and determine how the BMPs you implement will work together to improve overall runoff quality from your property. The activity sheets identify specific required BMPs, usually followed with the phrase "or equivalent method, measure, or practice." There may be acceptable BMPs that are not listed in the manual. Be creative in assessing your own needs and the constraints that you may face on your property. You are welcome to implement the stated BMP or an alternative BMP you believe better suits your particular situation. If you are interested in pursuing an alternative BMP, fill out and mail an Alternative BMP Request Form to the Clark County Clean Water Program. A copy of this form is provided at the end of this chapter.

Your BMP implementation strategy should be a well-thought-out approach to controlling runoff pollution from your site; you **do not** have to develop or submit any written plan.

Step 9 - Implement the Nonstructural Source-Control BMPs

First, implement the nonstructural operational BMPs that typically do not require extensive construction. Examples include educating employees on spill control and cleanup, use of drip pans or drop cloths, and sweeping instead of hosing a work area.

Step 10 - Implement, if Necessary, the Structural Source-Control BMPs

Second, implement the structural source-control BMPs that may require a building permit or are larger capital expenditures. Examples include constructing a building to enclose a work activity that is currently in the open, or berming a storage area to divert runoff.

Step 11 - Implement, if Necessary, a Treatment BMP

If a treatment BMP is determined to be necessary for your site, you must have an acceptable design prepared before it is constructed or installed. The Clark County Code, Chapter 40.380, *Stormwater and Erosion Control Ordinance*, must be followed in designing and receiving approval of treatment BMPs. Construction may begin once approval is received from the County.

Step 12 - Keep Records

Keep copies of your completed work sheet, the activity sheets, and other documentation on implementing BMPs. You may use records to illustrate your compliance with this manual, and as references for information on BMPs and who to call for assistance. You can also use the manual as a training tool for new employees.

Step 13 - Maintain your BMPs

Make sure employees are carrying out operational-type BMPs. Employee education should be a continuous process for effective BMP implementation. Check waste containers for deterioration and inspect and clean your catch basins regularly. The best way to make BMP maintenance routine is to schedule BMP checks and designate responsible individuals to be your BMP inspectors. As new employees join your company or agency, make sure to involve them in your pollution control efforts.

Make sure your employees carry out operational BMPs correctly and don't forget to train new employees in pollution control.

Step 14 - Evaluate Your BMPs

After a year or two, take some time to evaluate your BMPs and your decisions. Be aware of new technology. Is everything working as expected? Has your property use changed? Do you now know of something that can be done better?

Step 15 - Questions?

If you have questions or need assistance, please call the Clean Water Program at (360) 397-6118, ext. 4392.

Measuring Compliance

Compliance with the manual means implementing the required BMPs (or approved alternatives) and preventing the discharge of contaminants into the storm drainage system, surface waters, and groundwater. There are no requirements for monitoring your discharges or for submitting a BMP plan. Please keep in mind that the intent of the County code and the BMPs is to reduce the discharge of contaminants in the most efficient and least costly way.

In the manual, the county has identified general sets of required BMPs to reduce such discharges. The BMPs are general in order to comprehensively cover all activities and give flexibility for the variety of properties in the county. There are properties, however, where implementing the minimum BMPs may not adequately reduce the discharge of pollutants. Therefore, it is important to spend time evaluating your property and your activities before simply implementing the minimum requirements. You are encouraged to use the Clean Water Program's free on-site consultation service for assistance in evaluating your site and implementing the BMPs.

Evaluate your property and activities before implementing minimum BMPs

You may find that an alternative BMP would work better on your site. To implement an alternative you must complete a short application (included in the back of this chapter) and submit it to the Clark County Clean Water Program for approval.

If significant contaminant discharges continue from your site, even though you are doing the minimum BMPs, a County engineer will ask you to address those discharges. Similarly, if at one time you implemented BMPs but did not maintain them and they stopped working, a County engineer will request additional action. That action will be decided by consultation with you and could include additional source-control BMPs, installation of treatment BMPs, or other actions to control the pollutants.

In determining the need for additional BMPs and the time frame for action, the County engineer will consider whether you have made substantial progress and a good faith effort in reducing contaminated discharges and improving the quality of your stormwater. The County's intent is to work with you to implement the BMPs most appropriate for your situation, to prevent contamination of our water resources.

If you have questions or need assistance in determining appropriate BMPs for your property, call the Clean Water Program at (360) 397-6118, ext. 4392.

ACTIVITY WORKSHEET			
Business Type:			
Name:			
Address:			
Activity Sheet Number	Use this worksheet to identify the activities that you conduct. Interpret the categories broadly. Numbers A.1-49 correspond to sheets located in Chapter 3. TYPE OF ACTIVITY	Do you conduct this activity? If so, where?	
		INDOORS	OUTDOORS
STORAGE			
A.1	Required BMPs for All Activities		
A.2	Storage of Liquid Materials in Stationary Tanks * this does not include underground tanks or small containers		
A.3	Storage of Any Liquid Materials in Portable Containers * such as drums, buckets, jugs, or barrels		
A.4	Storage of Soil, Sand, Salt, and Other Erodible Materials * this includes storage of all types of erodible materials		
A.5	Storage of Pesticides and Fertilizers * this includes nonliquid pesticides and bags or piles of fertilizer		
A.6	Storage and Treatment of Contaminated Soils * this applies to contaminated soils that are excavated and left on site		
A.7	Storage and Processing of Food Items *this includes storage of fruits, vegetables, meats, and other foods and processing activities at wineries, fresh and frozen juicemakers, and other food and beverage processing operations		
A.8	Storage of Solid Wastes and Food Wastes * this includes regular garbage and all other discarded nonliquid items		
A.9	Storage of Scrap and Recycling Materials * this includes scrapped equipment, metal, empty metal drums, junk appliances and vehicles, and assorted recyclables		
A.10	Treatment, Storage, or Disposal of Dangerous Wastes		
WASHINGS			
A.11	Cleaning or Washing of Tools and Equipment * this includes tools, all types of manufactured equipment components, and work equipment such as lawn mowers and fork lifts		
A.12	Cleaning or Washing of Cooking Equipment * this includes vents, filters, pots and pans, grills, and related items		
A.13	Vehicle Washing and Steam Cleaning * this covers cleaning and washing at all types of establishments, including fleet vehicle yards, car dealerships, car washes, and maintenance facilities		
A.14	Mobile Interior Washing Operation * this includes carpet cleaners, upholstery cleaners, and drapery cleaners		
A.15	Pressure Washing of Buildings, Rooftops, and Other Large Objects		
TRANSFERS OF LIQUID MATERIALS			
A.16	Truck or Rail Loading and Unloading of Liquid Materials		
A.17	Fueling Operations * this includes gas stations, pumps at fleet vehicle yards or shops, and other privately owned pumps		
A.18	Engine Repair and Maintenance * this covers oil changes and other handling of engine fluids		
A.43	Mobile Fueling		

ACTIVITY WORKSHEET			
Business Type:			
Name:			
Address:			
Activity Sheet Number	Use this worksheet to identify the activities that you conduct. Interpret the categories broadly. Numbers A.1-49 correspond to sheets located in Chapter 3. TYPE OF ACTIVITY	Do you conduct this activity? If so, where?	
		INDOORS	OUTDOORS
PRODUCTION & APPLICATION			
A.19	Concrete and Asphalt Production at Stationary Sites		
A.20	Concrete and Asphalt at Temporary Sites * this includes construction sites, remodeling, and driveway and parking lot resurfacing		
A.21	Manufacturing and Post-Processing of Metal Products * this includes machining, grinding, soldering, cutting, welding, quenching, rinsing, etc.		
A.22	Painting, Finishing, and Coating of Vehicles, Products, and Equipment		
A.23	Wood Treatment and Preserving * this includes small-scale contractor operations (such as patio decks),		
A.24	Commercial Composting		
A.25	Chemical Applications-Other than for Landscaping (this includes use of algacides, fungicides, pesticides, and rodenticides		
A.47	Manufacturing Activities – Outside		
A.48	Dust Control at Manufacturing Areas		
A.49	Soil Erosion and Sediment Control at Industrial Sites		
LANDSCAPING			
A.26	Landscaping Activities * this includes vegetation removal, herbicide and insecticide application, fertilizer application, gardening, and lawn care		
CONSTRUCTION			
A.27	Clearing, Grading, and Preparation of Small Construction Sites		
A.28	Demolition of Buildings		
A.29	Building Repair, Remodeling, and Construction		
A.30	Boat Building, Maintenance, and Repair		
A.31	Vehicle and Equipment Parking and Storage * this includes all types of parking lots (commercial, public, and private), retail/store parking, car dealerships, rental car lots, other fleet vehicle lots, equipment storage and parking areas (such as at equipment rental yards)		
A.45	Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots		
OTHER			
A.32	Sidewalk Maintenance		
A.33	Swimming Pool and Spa Cleaning and Maintenance *this includes every swimming pool and spa not at a single family residence		
A.34	Keeping Animals in Controlled Areas * this includes kennels, rabbit hutches, and similar animal rearing and care		
A.35	Keeping Livestock in Stables, Pens, Pastures or Fields * this includes cattle, horses, pigs, sheep, goats, and other hooved animals		
A.36	Logging * this applies to Class IV general forest practices only		
A.37	Mining and Quarrying of Sand, Gravel, and Other Materials * this covers sand, gravel, minerals, peat, clay, rock, etc. but does not include excavation at construction sites		

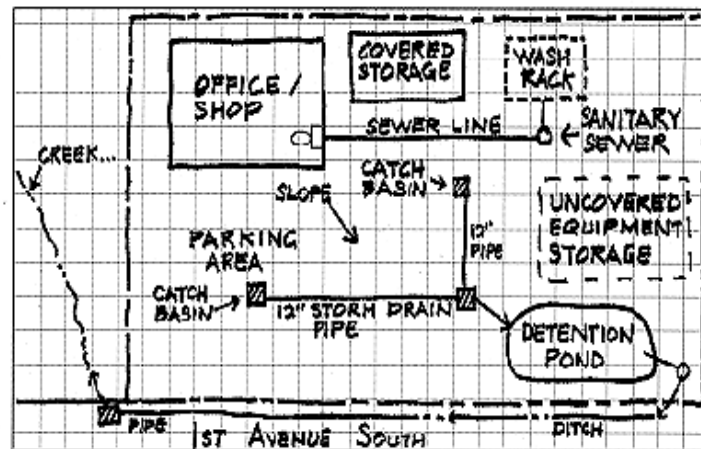
ACTIVITY WORKSHEET			
Business Type:			
Name:			
Address:			
Activity Sheet Number	Use this worksheet to identify the activities that you conduct. Interpret the categories broadly. Numbers A.1-49 correspond to sheets located in Chapter 3. TYPE OF ACTIVITY	Do you conduct this activity? If so, where?	
		INDOORS	OUTDOORS
Other			
A.38	Well and Geotechnical Drilling * this includes mechanical drilling of water wells, environmental protection and monitoring wells, and geotechnical borings		
A.39	Roof Vents and Fugitive Emissions		
A.40	Street Deicing Operations		
A.41	Wheel Wash and Tire Bath Operations		
A.42	Potable Water Line Flushing or Tank Maintenance		
A.44	Airport Anti-Icing and Deicing		
A.46	Log Sorting & Handling		

ONSITE STORM DRAINAGE SYSTEM WORKSHEET

Instructions

- If you have a set of plans/blueprints of your site and the associated storm drainage system, familiarize yourself and your employees with drainage patterns and drainage structure location.
- If you do NOT have a set of plans, prepare a rough sketch which shows the following.
 - **Drainage structures i.e., catch basins, pipes, ditches, ponds, vaults, etc.**
 - **Buildings**
 - **Storage structures/sheds**
 - **Storage areas**
 - **Places/points where stormwater leaves your site**
- Use the back of this sheet for your sketch. A rough sketch will familiarize you with your on-site drainage system and aid in the implementation of best management practices. If you have any questions call the Clark County Clean Water Program at (360) 397-6118, ext.4392.

EXAMPLE



ALTERNATIVE BEST MANAGEMENT PRACTICES (BMP) REQUEST

THIS FORM is to be used to request the use of an alternative **BMP** to one or more of the minimum **BMP** requirements or for a major modification to one of the required **BMPs** as stated in the Clark County Stormwater Pollution Control Manual. It can be used by those who already have **BMPs** on their site that may differ from the requirements, or in cases where implementation of one or more of the required **BMPs** is not the best or preferred solution.

AFTER RECEIVING THIS REQUEST, the Environmental Services Division will: (1) Review the request; (2) Notify the applicant the request was received and when a decision will be made; and (3) Notify the applicant in writing of approval or denial, and an explanation of the decision.

INSTRUCTIONS:

1. Answer each question on this form as briefly as possible while still conveying relevant information.
2. Additional pages can be used if necessary.
3. Return this request to:
 - Clean Water Program
 - Clark County Public Works;
 - PO Box 9810, Vancouver, WA 98666-9810

TO BE COMPLETED BY APPLICANT:

Date: _____ Applicant's name: _____

Facility name: _____ Owner name: _____

Facility address: _____

Phone number: _____ Type of business/facility (brief description) _____

<p>Specific activity under consideration for BMP:</p>
<p>What the Manual requires:</p>
<p>Why this will not work on site or is not as desirable:</p>

CHAPTER 2. STORMWATER: YOUR ROLE

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Stormwater Runoff

In vegetated areas such as forests, fields, and wetlands, rainwater seeps into the ground. However, when rain falls on paved and other hard surfaces it runs off and is conveyed by pipes and ditches directly to Clark County's streams, wetlands, and lakes. In many areas stormwater is also routed to subsurface disposal wells (drywells) or trenches. This water that flows across the land is called stormwater runoff. Stormwater runoff, although starting as rain, collects pollutants when it hits the ground and travels. For example, runoff from parking lots picks up oil and grease dripped from cars, asbestos from worn brake linings, and zinc from tires. Pesticides, herbicides, and fertilizers are washed off from landscaped areas, and soils are washed away from construction sites. Any substance found on the ground can wind up in stormwater runoff.

Stormwater runoff starts as rain but collects pollutants when it hits the ground.

Storm Drains Lead To Streams and Lakes

Storm drainage systems are designed to decrease the chance of flooding in areas that have been developed with homes, businesses, and roads. The rainwater that used to seep into vegetated areas now must be collected and carried elsewhere. The storm drainage system collects this stormwater runoff and carries it to the nearest stream, wetland, lake, or to groundwater. In urban areas the storm drainage system consists largely of drains and underground pipes. Storm drains are normally located in streets and parking lots. In rural areas, the storm drainage system may be in the form of ditches that carry the stormwater along a roadside or piece of property. These drainage systems are meant to carry only unpolluted stormwater to the nearest natural body of water.

Putting oil, antifreeze, detergents, and other material into the storm drainage system is the same as dumping them right into a stream or lake.

The sanitary sewer system is different and separate from storm drainage. A sanitary sewer leads to a wastewater treatment plant that treats the wastewater to acceptable limits before it is piped to surface water. Sanitary sewer systems carry household wastewater and some permitted industrial wastewater. The wastewater in this system is treated before being discharged into a natural water body.

Polluting Is Against the Law

Keeping pollutants out of the water isn't just a good idea—it's the law. The Washington State Water Pollution Control Law (RCW 90.48) and the Clark County Code (Chapter 13.26A) prohibit the discharge of pollutants to the storm drainage system, surface water and groundwater. Direct dumping of material or polluted stormwater can harm every water body it enters. Pollution can cause destruction of fish spawning areas and other habitat for plants and animals; decrease in fishing, swimming, and boating opportunities; degraded groundwater quality; lesions and tumors in fish and other animals; and algal blooms that impair aquatic habitat, recreation, and aesthetics.

Ways You May Be Polluting

Many people know that it is illegal to dump toxic chemicals or other material down a storm drain. But you also are polluting if you allow pollutants to be washed into a storm drain with stormwater runoff or with wash water. For instance, you may be polluting if you

- allow wash water from engine or equipment washing to enter a storm drain;
- spill antifreeze or other material on your site without cleaning it up;
- allow materials or wastes stored outside to leak on the ground; or
- clear vegetation from land without taking steps to prevent erosion.

Keep your work site clean and make sure to handle and store polluting material properly.

Virtually anything on the ground surface can become a water pollutant. Therefore, it is important to keep a clean work site and ensure that polluting material is properly handled and stored.

Pollutants

Any substance that can render water harmful to people, fish, or wildlife or impair recreation or other beneficial uses of water is considered a pollutant. The broad categories of pollutants and their effects on fish and wildlife are described below.

Figure 2.1 (located at the end of this chapter) presents all the industrial, commercial, and agricultural activities addressed in this manual. This figure indicates the types of pollutants that may be generated by those activities, as well as the types of receiving water bodies that may be affected by stormwater runoff from the activity sites.

Oil and Greases

Oils and greases are a common component of stormwater runoff pollutants, primarily because there are so many common sources: streets and highways, parking lots, food waste storage areas, heavy equipment and machinery storage areas, and areas where pesticides have been applied. The familiar sight of a rainbow-colored puddle or trickling stream in parking lots, driveways, and street gutters is a reminder of the presence of oils and greases in stormwater runoff. Oils and greases can be petroleum-based or food-related (such as cooking oils). No type of oil or grease belongs in surface water. Oil and grease are known to be toxic to aquatic organisms at relatively low concentrations; they can coat fish gills, prevent oxygen from entering the water, and clog drainage facilities (leading to increased maintenance costs and potential flooding problems).

Metals

Many heavy metals, including lead, copper, zinc, and cadmium, are commonly found in urban runoff. Metals can contaminate surface and ground waters and concentrate in bottom sediments, presenting health problems for fish and animals that eat from the bottom. Reproductive cycles of bottom-dwelling species can be severely reduced, and fish inhabiting such metal-contaminated locations often exhibit lesions and tumors. Metals can also contaminate drinking water supplies. Industrial areas, scrap yards, paints, pesticides, and fallout from automobile emissions are typical sources of heavy metals in runoff.

Metals can cause problems for fish and other animals.

Sediments

Sediment—often originating as topsoil, sand, and clay—is the most common pollutant in stormwater runoff by volume and weight. Sediments readily wash off paved surfaces and exposed earth during storms. Sediment may seem harmless enough, but it poses serious problems in the water. Excess sediment concentrations turn stream and lake water cloudy, making it less suitable for recreation, fish life, and plant growth. Sediment is of particular concern in fish bearing streams where it can smother trout and salmon eggs, destroy habitat for insects (a food source for fish), and cover prime spawning areas. Uncontrolled sediment can also clog storm drains, leading to increased private and public maintenance costs and flooding problems.

Sediment is also of concern because many other pollutants including oils, metals, bacteria, and nutrients tend to attach to soil particles. Therefore, when sediments enter water they usually carry other pollutants with them.

Cleared construction sites and exposed earth are generally the greatest contributors of soil particles in surface waters. Other sources include erosion from agricultural lands, application of sand and salts to icy roads, fallout from pressure washing and sandblasting operations, dirt from equipment and vehicles, and dirt and grit from parking lots, driveways, and sidewalks.

Oxygen-Demanding Substances

Plant debris, food waste, and some chemical wastes fall into a category of water pollutants known as oxygen demanding substances. Such substances use dissolved oxygen in water when they decay or chemically react. If dissolved oxygen levels in water become too low, aquatic animals can become stressed or die. Salmon and trout are particularly at risk because they need high dissolved oxygen levels to live. Animal wastes, food wastes, leaves and twigs, and other miscellaneous organic matter carried by stormwater runoff into surface water can lead to reduced oxygen levels. Slow-moving waters are particularly susceptible to oxygen depletion because aeration of the water by turbulence is lacking. Therefore, oxygen that is depleted in slow-moving waters due to the presence of excess organic matter or unnatural chemical compounds is not replaced. Reduced oxygen levels in these waters are often particularly severe after a storm.

Nutrients

Nutrients such as phosphorus and nitrogen are needed by plants to grow, but high levels can be harmful to water quality. Excess nutrient levels can overstimulate the growth of algae and other aquatic plants, resulting in unpleasant odors, unsightly surface scums, and lowered dissolved oxygen levels from plant decay. Nutrients are most likely to pose a problem in slow moving water such as lakes or sluggish streams.

Excess nutrient levels can come from fertilizers, septic systems, automobile emissions, and other sources and can be unhealthy for fish.

Some forms of algae are toxic to fish and other aquatic organisms and may even cause death in animals that drink affected water. Algae can also cause foul-smelling odors in ponds and lakes, and problems with clogged water intakes, drains, and pipes. Heavy loading of nutrients into slow-moving waters can adversely affect many beneficial uses of the water. Forms of nitrogen (ammonium), in combination with pH and temperature variations, can cause water quality problems and be toxic to fish. This process consumes large amounts of oxygen in the water and subsequently stresses or kills fish and other aquatic organisms when oxygen levels are reduced. Ammonia toxicity, due to nitrogen in its ammonium form, can harm fish and other aquatic organisms.

Fertilizers, animal wastes, failing septic systems, detergents, road deicing salts, automobile emissions, and organic matter, such as lawn clippings and leaves, are all contributors to excessive nutrient levels in urban and agricultural stormwater runoff.

Toxic Organic Compounds

Pesticides and polychlorinated biphenyls (PCBs) are toxic organic compounds that are particularly dangerous in the aquatic environment. Excessive application of insecticides, herbicides, fungicides, and rodenticides, or application of any of these shortly before a can result in toxic pesticide chemicals being carried from agricultural lands, construction sites, parks, golf courses, and residential lawns to receiving waters. Many pesticide compounds are extremely toxic to aquatic organisms and can cause fish kills.

Applying too much insecticide, herbicide, fungicide, and rodenticide can carry these toxic chemicals to our rivers and lakes.

PCBs are a similar class of toxic organic compounds. They can contaminate stormwater through leaking electrical transformers. PCBs can settle in sediments of receiving waters and, like pesticide compounds, present a serious toxic threat to aquatic organisms that come in contact with them.

Many other toxic organic compounds can also affect receiving waters. These toxic compounds include phenols, glycol ethers, esters, nitrosamines, and other nitrogen compounds. Common sources of these compounds include wood preservatives, antifreeze, dry cleaning chemicals, cleansers, and a variety of other chemical products. Like pesticides and PCBs, these other toxic organic compounds can be lethal to aquatic organisms.

Fecal Coliform Bacteria

Fecal coliform bacteria in water may indicate the presence of pathogenic (disease-causing) bacteria and viruses. Pet and other animal wastes, failing septic systems, livestock waste in agricultural areas and on hobby farms, and fertilizers can all contribute fecal coliform bacteria. This bacteria can limit recreational use of a water body.

pH

The pH value of water is an indication of its relative acidity. The total pH range is from 0 to 14, with a pH between 6 to 8 being desirable for most bodies of water. Waters with very high (basic) or very low (acidic) pH are corrosive to metal surfaces and can cause biological problems for aquatic organisms and fish. There are several sources that can influence pH in runoff. Examples of activities that can influence pH include industrial processes that discharge acidic wastewater, solutions used in metal plating operations, acidic chemicals used in printing and graphic art businesses, cement used in concrete products and concrete pavement, and chemical cleaners used in homes and businesses.

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Optional BMPs

The BMPs listed below are measures that should be considered at all times for improving pollution control. These BMPs are NOT REQUIRED, but should be incorporated in your plan of implementing BMPs. Implementation of some of these BMPs may reduce or eliminate the need to implement other more complicated or costly BMPs discussed later in the activity sheets.

1. Locate Activities as Far as Possible From Surface Drainage Paths

Locating activities on high ground, far from drainage paths, ditches, gutters, and storm drains allows more time to recognize spills and act to prevent water contamination.

2. Avoid the Activity or Reduce its Occurrence

Often an alternate production process or material application process can be used to substitute for another, more polluting, process. Ideally, a polluting activity can be avoided altogether, or its frequency of occurrence reduced. An example is washing vehicles less often or taking vehicles to commercial car washes or detail shops rather than washing on site.

3. Use Less Material

Improper disposal of excess material or increased application of materials simply because excess is available can cause pollution. Purchase only the amount of material that will be needed for foreseeable use. In most cases you will see cost savings in both purchasing and disposal.

4. Use the Least Toxic Materials Available

All applications of solid and liquid materials should use the least toxic products and raw materials available, whether in production; cleaning; pesticide applications; or other uses. Clark County Clean Water Program should be should be consulted for information on using less toxic products.

5. Create and/or Maintain Vegetated Areas Near Activity Locations

Grass and other types of vegetation can filter out many pollutants in stormwater runoff. Vegetated areas should be maintained around areas where polluting activities occur, especially down slope of activity areas. Routine maintenance will keep vegetated areas healthy and capable of filtering pollutants.

6. Recycle as Much as Possible

Recycling is always preferable to disposal of unwanted materials. Leftover paints, finishes, cleaning materials, building materials, etc. may be used by someone else, so don't throw them away. Contact a neighbor, friend, school, church, community group, theater group, etc. to see if your leftover materials can be used. Many empty containers and other common items are recyclable. Contact the Clark County Solid Waste Program (360) 6118 ext. 4352 for recycling options.

7. Educate Others About Stormwater Pollution Prevention

Educate your employees, business associates, contractors, family, and friends about stormwater pollution control. Encourage others to find solutions to stormwater pollution problems, and to continue learning about pollution control techniques.

8. Implement Treatment BMPs

Treatment BMPs are used to remove pollutants from stormwater before being discharged from a site. These include oil water separators, as well as numerous systems such as biofiltration swales, infiltration, and constructed wetlands. These BMPs may be a preferred option in certain circumstances. A number of treatment BMPs are described in Chapter Four.

BMP Activity Sheets

This chapter consists of a series of activity sheets (AS) listing the BMPs required for various activities conducted in unincorporated Clark County. All of the activities that have BMPs in this section are listed in the activity sheet tables at the end of Chapter 1.

The manual limits the requirements to a number of minimal measures that reasonably balance stormwater pollution reduction with feasibility and cost. The manual also includes additional, recommended BMPs that should always be considered in the effort to control pollution. The County's goal is to reduce pollution through prevention efforts, emphasizing source-control BMPs before treatment.

Every property in the County has unique characteristics and drainage systems. Some sites have a constructed storm sewer system with catch basin inlets, whereas others drain to a ditch or infiltrate into the ground. The type of drainage system, as well as the slope and ground cover of a site, will affect the selection of BMPs. The activity sheets offer flexibility in BMP selection and as much as possible, recognizing the wide variety of site conditions that may be encountered.

AS A-1: Required BMPs for All Activities

Minimum Requirements

The following BMPs are required if you own or occupy property in unincorporated Clark County (not including single family residential property).

1. Clean Your Storm Drainage System

Clean your storm drainage system, including storm drains, gutters, catch basins, and conveyance ditches to prevent the transport of pollutants into receiving waters. Routine maintenance procedures must include cleaning of the storm drainage system, without using water to flush sediments and debris, through the system.

✓ *See BMP Information Sheet 7 in Chapter 4 for details on catch basin cleaning requirements.*

2. Stencil Your Storm Drains

Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage systems. Messages include “Dump No Waste Drains to Stream” where storm sewer drains to surface water or “Dump No Waste Drains to Drinking Water” where drains go to drywells or French drains.

✓ *You can obtain stencils from the Clark County Clean Water Division at (360) 397-6118 ext, 4392.*

3. Eliminate Illicit Connections to the Storm Drainage System.

A common situation that can cause severe stormwater pollution problems is discharge of nonstormwater to the storm drainage system. Examples are discharges from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges should be going to the sanitary sewer system, a holding tank, an on-site process water treatment system, or a septic system. You must correct these illicit discharges. If you have any question as to whether your discharge is allowable, contact the Clark County Clean Water Program at (360) 397-6118 ext. 4392.

✓ *See BMP Information Sheet 1 in Chapter 4 for information on how to check for illicit connections. You can also ask for help from your local sewer utility. If you find out that your internal drains are improperly connected to the storm drainage system, they will need to be either removed, permanently plugged, or connected to the sanitary sewer, septic system, on-site treatment system, or a holding tank.*

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AS A-2: Storage of Liquid Materials in Stationary Tanks

This activity applies to you if you store any type of liquid chemicals, waste oils, solvents, or petroleum products in above ground stationary tanks. Leaking tanks on these sites can contribute toxic compounds, oils and greases, heavy metals, abnormal pH, and nutrients to stormwater runoff. In addition, spills may occur during liquid transfer operations to and from the tanks.

This activity does not apply to underground storage tanks or to businesses permitted by the Washington State Department of Ecology (Ecology) to treat, store, or dispose of dangerous wastes. Storage of reactive, combustible, or flammable liquids must comply with the fire code requirements and may need to comply with Ecology regulations. See Chapter 5 for details on other agency regulations.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in storage of liquid materials in stationary tanks.

1. Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment.*
2. All installations shall comply with the Uniform Fire Code and the National Electric Code.
3. Installations shall include a tank overfill protection system to minimize the risk of spillage during loading.
4. Routine maintenance:
 - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
 - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
 - Sweep and clean the storage area monthly if it is paved. Never hose down the area to a storm drain.
 - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

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- ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

AS A-3: Storage of Any Liquid Material in Portable Containers

This activity applies to you if you store any type of liquid chemicals, waste oils, solvents, or petroleum products in portable containers such as drums. This activity covers permanent storage, as well as temporary storage areas at temporary sites. Spills and drips of stored liquids can contribute toxic compounds, oils and greases, heavy metals, abnormal pH, and nutrients to stormwater runoff.

This activity does not apply to businesses that are permitted by Ecology to treat, store, or dispose of dangerous wastes. Storage of reactive, combustible, or flammable liquids must comply with the fire code requirements and must comply with Ecology regulations. See Chapter 5 for details on agency regulations.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in storage of liquid materials in portable containers.

1. Place tight-fitting lids on all containers.
2. Enclose or cover the containers where they are stored.

The local fire district must be consulted for limitations on roofs or covers over containers used to store flammable materials.

3. Store containers in designated area, which is covered, bermed, or diked and impervious in order to contain leaks and spills. The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.
4. 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.
5. Raise the containers off the ground by use of a pallet or similar method, including provisions for spill control.

OR

Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface water, or groundwater.

✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment options.*

6. Place drip pans or absorbent materials beneath all mounted container taps, and at all potential drip and spill locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be reused, recycled or properly disposed.

✓ *See BMP Information Sheet 2 in Chapter 4 for more information on disposal options.*

7. For liquid wastes, surround the containers with a dike 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.

8. Routine Maintenance:

- Store and maintain appropriate spill cleanup materials in a location known to all near the container-storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Sweep and clean the storage area monthly if it is paved. Never hose down the area to a storm drain.
- Check containers (and any containment sumps) daily for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with tanks in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metals drums. New or secondary containers must be labeled with the product name and hazards.
- Collect all spilled liquids and properly dispose of them.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

AS A-4: Storage of Soil, Sand, Salt and Other Erodible Materials

This activity applies to you if you are stockpiling erodible raw materials such as soil, sawdust, gravel, sand, and road deicing salts. It covers permanent sites, as well as temporary construction sites and other temporary locations. Raw material stockpiles can easily erode because of rain or wind and contribute suspended solids, nutrients, heavy metals, and abnormal pH to stormwater runoff.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in storage or stockpiling of MORE THAN 5 cubic yards of erodible material on a normal basis. The 5 cubic yard minimum does not apply to stockpiles of less than 5 cubic yards in a location where they could erode into the storm drainage system.

1. Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring.

OR

If the stockpiles are so large that they cannot feasibly be covered and contained, you must implement erosion control practices at the perimeter of your site and at any catch basins to prevent erosion of the stockpiled material off site. Ensure that contaminated stormwater is not discharged directly to catch basins without conveying through a treatment BMP.

- ✓ *See BMP Information Sheet 3 in Chapter 4 for information on covering options.*
- ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment options.*

2. Routine maintenance:
 - Sweep paved storage areas monthly for collection and disposal of loose solid materials. Never hose down the area to a storm drain or conveyance ditch.
 - Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area.

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in storage or stockpiling of LESS THAN 5 cubic yards of erodible material on a temporary basis.

1. Cover the stockpiles of raw materials to prevent stormwater from running into the covered piles. The cover must be in place at all times when work with the stockpiles is not occurring.

✓ *See BMP Information Sheet 3 in Chapter 4 for information on covering option.*

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. A catch basin insert or cover configured for sediment removal may remove some of the pollutants in runoff from this activity. (Catch basin inserts or covers require frequent maintenance to be effective. Carefully consider this when making your decision.)
2. If and when feasible, collect and recycle water-soluble materials (leachates) to the stockpile.

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-5: Storage of Pesticides and Fertilizers

This activity applies if you store nonliquid pesticides or fertilizers. See ASs A-2 and A-3 for storage of liquid materials. Runoff from pesticide storage areas can be contaminated with toxic compounds, oils, and heavy metals; runoff from fertilizer storage areas can be contaminated with nutrients and fecal coliform bacteria. The primary problem with most of these pollutants is that they are soluble, which means they cannot easily be filtered out of stormwater runoff, or out of contaminated water that seeps into the soil. Storage of pesticides and fertilizers may need to comply with the State Department of Agriculture regulations. See Chapter 5 for details on other regulations.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in storage of pesticides and fertilizers.

1. Cover pesticides and fertilizers.

- ✓ *See BMP Information Sheet 3 in Chapter 4 for information on covering options, which includes nonstructural or structural options.*

2. Raise the material off the ground by use of pallets or similar methods, with provisions for spill control.

OR

Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.

- ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment options.*

3. Routine maintenance:

- Store and maintain appropriate spill clean up materials in a location known to all near the storage area.
- Clean up any spilled fertilizer or pesticides and ensure that the materials are kept in the designated covered or contained areas.
- Sweep paved storage areas monthly for collection and disposal of loose solid materials. **Never** hose down the area to a storm drain or conveyance ditch.

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AS A-6: Storage and Treatment of Contaminated Soils

This activity applies to you if you store and treat soils contaminated with toxic organic compounds, oils and greases, and heavy metals. Typically this situation arises when other site work is being conducted, such as removing a leaking underground tank. Contaminated soils are usually excavated and left on the premises for treatment via aeration and perhaps chemical stabilization. Stormwater runoff that comes in contact with contaminated soil can carry some of those same contaminants along with suspended solids into receiving waters. Ecology regulates businesses engaged in this activity. In addition, a permit from the Southwest Clean Air Agency is required if the treatment method for removing soil contaminants involves forcing air through, or sucking air from, the soil. The BMPs below supplement other required regulations.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in storage and treatment of contaminated soils.

1. Cover or contain contaminated soils to prevent stormwater from carrying pollutants **away**.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.*
2. Routine maintenance:
 - Sweep paved storage areas monthly for collection and disposal of soil particles. Never hose down the area to a storm drain or conveyance ditch.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*
 - Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. A catch basin insert for sediment removal may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)
 - ✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

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AS A-7: Storage or Processing of Food Products

This activity applies to you if you: temporarily store fruits and vegetables outdoors prior to processing or other use; crush, cut, or shred fruits or vegetables for wines, frozen juices, and other food and beverage products; or process meats and other foods for wholesale. Stormwater runoff from these areas may be contaminated with nutrients from crushed or decaying fruits and vegetables and assorted suspended solids from unwashed produce.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in STORAGE of fruits or vegetables:

1. Prevent water used to clean fruits and vegetables from entering the storm drain system.
2. Routine maintenance:
 - Clean the storage area weekly to collect dirt and fragments of fruits or vegetables or other foods for proper disposal in your solid waste.
 - Stock cleanup materials such as brooms and dustpans near the storage area.
 - Minimize outdoor storage time for fruits and vegetables whenever possible.
 - Collect rotting produce frequently and dispose of properly.

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in PROCESSING of fruits, vegetables, meats, and other foods.

1. Enclose the processing area. Any discharges should drain to the sanitary sewer or treatment facility.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 and Regulation 7 in Chapter 5 for information on sanitary sewer regulations.*

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AS A-8: Storage of Solid Waste and Food Wastes

This activity applies to you if you store solid wastes, including both food and nonfood wastes, outdoors. This typically refers to garbage dumpsters, other outdoor waste containers, and any stockpiled garbage. Improper storage of nonfood solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, and suspended solids to enter stormwater runoff. Stormwater runoff from food waste storage areas may be contaminated with oils and greases, nutrients, and suspended solids if waste containers are leaking, are not covered, or are too small to contain the amount of waste generated. If you store dangerous wastes you must follow specific regulations outlined by Ecology.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in storage of solid wastes or food wastes.

1. Cover storage containers with leak-proof lids or keep them under cover such as a lean-to or by some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use, and the storage area must be on an impervious surface.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.*
2. Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
3. Routine maintenance:
 - Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
 - ✓ *See the requirements of the Clark County Public Health Department discussed in Chapter 5 for information on acceptable containers.*
 - Sweep and clean the storage area monthly if it is paved; never hose oil or debris down the area to a storm drain.
 - Dispose of rinse and wash water from cleaning your containers into a sanitary sewer according to Health Department and sewer agency requirements. See the discussion on Health Department and sewer agency requirements in Chapter 5 for more information.

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- ✓ *See BMP Information Sheet 2 in Chapter 4 and Regulation 7 in Chapter 5 information sanitary sewer regulations.*

AS A-9: Storage of Scrap and Recycling Materials

This activity applies to you if you salvage and store scrap metal, scrap equipment, junked appliances and vehicles, empty metal drums, and recyclable items such as cans, bottles, and paper products for longer than two weeks (unless material is rotated and storage is essentially continuous). Stormwater runoff from these sites may contain toxic hydrocarbons, PCBs, other toxic compounds, heavy metals, oils and sediment.

Washington Department of Ecology's *Vehicle Recyclers* guidance document (<http://www.ecy.wa.gov/pubs/94146.pdf>) contains BMPs for specifically listed activities associated with businesses engaged in this activity.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in storage of scrap and recycling materials.

1. All BMPs listed in Ecology's *Vehicle Recyclers* guidance document (<http://www.ecy.wa.gov/pubs/94146.pdf>) are required for all associated activities.
2. Designate an area to drain gasoline, engine fluids, and other contaminated liquids from scrapped items and dispose of waste properly (or preferably recycle it) before the items are placed in the scrap storage area.

The draining and transferring of fluids from vehicles and other equipment to storage containers in the designated area must be on impervious surface or over drip pans. Contain the designated draining area to prevent stormwater from entering the draining area and carrying pollutants away.

See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.

3. If you are involved in transporting any of these materials you must either: 1) carry spill cleanup material in the vehicle to capture any spilled liquids, or 2) place an impermeable liner in the bed of your truck to capture any spilled or leaked materials. Properly dispose or reuse any collected fluids.
4. Routine maintenance:
 - Check incoming scrap materials for potential fluid contents and batteries, and always use the designated fluid draining area.
 - Inspect the storage area monthly to check for contamination from leaky equipment. Promptly fix and clean any leaks, spills, or contamination in the storage area.

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- Sweep open areas of the scrap storage area monthly, if they are paved, to collect and properly dispose of loose metal scraps and other particles. Never hose down the area to a storm drain.
- Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. A catch basin insert, configured for debris removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-10: Treatment, Storage, or Disposal of Dangerous Wastes

This activity applies to businesses that are permitted by Ecology to treat, store, or dispose of dangerous wastes. Dangerous waste handling activities at these businesses can contribute toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, abnormal pH, and coliform bacteria to stormwater runoff. Detailed BMPs are not included here because treatment, storage, and disposal site requirements are beyond the level of typical BMP application. Ecology regulates these facilities with specific requirements, which include the need for a NPDES permit.

- ✓ *Contact Ecology at (360) 407-6000.*

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AS A-11: Cleaning or Washing of Tools and Equipment

This activity applies to you if you clean tools and manufacturing equipment such as saws, grinders, screens, and other processing devices outside of buildings. Uncontrolled outdoor washing can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, heavy metals, abnormal pH, and suspended solids to stormwater runoff.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in cleaning or washing of tools and manufacturing equipment.

1. Equipment wash water is considered process water, and must discharge to the sanitary sewer, a holding tank, or a process treatment system, regardless of the washing method used.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

You are encouraged to recycle your wash water with an enclosed loop system or use self-contained parts washers. There are several products commercially available that enable recycling and containing of wash water and cleaning solvents.

If you cannot connect discharges to a sanitary sewer, process treatment system, or holding tank, you must contact Ecology and obtain an industrial wastewater discharge permit.

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AS A-12: Cleaning or Washing of Cooking Equipment

This activity applies to you if you clean cooking equipment, such as vent filters and grills, outside of buildings. Uncontrolled outdoor washing can contribute oils and greases, nutrients, and suspended solids to stormwater runoff.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in cleaning or washing of cooking equipment.

1. Cooking equipment wash water is considered process water, and must discharge to the sanitary sewer, a holding tank, or a process treatment system, regardless of the washing method used.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

This washing should be done in an inside sink or wash bin and not outside. If washing is done outside, it must be done in a designated area and the wash water must discharge to one of the above and provisions must be made to prevent stormwater run-on into the washing area.

✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.*

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AS A-13: Vehicle Washing and Steam Cleaning

This activity applies to you if you wash or steam clean vehicles. It also applies to mobile steam cleaning operations and commercial car washes. The types of vehicles may include highway maintenance trucks, taxicabs, buses, rental cars, new and used autos on lots, government and company cars, construction equipment, fork lifts, golf carts, riding lawn mowers, and similar large vehicles. Wash water from cleaning activities can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, heavy metals, and suspended solids to stormwater runoff. The soap used for washing is often a greater pollution threat than the substances washed off of vehicles.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in vehicle washing and steam cleaning. Refer to Washington Department of Ecology's 2007 *Vehicle and Equipment Washwater Discharge* BMP manual (<http://www.ecy.wa.gov/pubs/95056.pdf>) for additional information.

1. It is allowable to rinse down the body of a vehicle, including the bed of a truck, with just water without doing any wash water control BMPs.

If you wash (with mild detergents) on an area that absorbs water, such as gravel, grass, or loose soil, it is acceptable to let the wash water soak into the ground as long as you only wash the body of vehicles.

However, if you wash on a paved area and use detergents or other cleansers, or if you wash/rinse the engine compartment or the underside of vehicles, you must use **ONE** of the following options:

- a) Designate and pave a wash area to wash all vehicles in. Discharge wash water from vehicle cleaning operations to a sanitary sewer, holding tank, or process treatment system or process through an enclosed recycling system.
- ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

Ecology, the Clark Regional Wastewater District and the City of Vancouver have limits on the types and amounts of pollutants, such as oil and heavy metals, which can be discharged to a sanitary sewer. Absolutely no untreated wash water can enter storm drains.

OR

- b) Designate and pave a wash area to wash all vehicles in. Use a storm drain cover or other effective method of preventing all wash and rinse water from entering a storm

drain or other storm drainage system feature. All runoff from the activity must be collected for proper disposal to a sanitary sewer. A wet vacuum or pump can be used for this. There are several products commercially available that enable collection of runoff. This requirement also applies to mobile vehicle washing services.

OR

- c) Take the vehicles to a commercial car wash or use a mobile washer which complies with (a) or (b) above.

OR

- d) Conduct outside washing operation in a designated wash area with the following features:
 - In a paved area, constructed as a spill containment pad to prevent the run-on of stormwater from adjacent areas. Slope the spill containment area so that washwater is collected in a containment pad drain system with perimeter drains, trench drains or catchment drains. Size the containment pad to extend out a minimum of four feet on all sides of the vehicles and/or equipment being washed.
 - Convey the washwater to a sump (like a grit separator) and then to a sanitary sewer (if allowed by the local Sewer Authority), or other appropriate wastewater treatment or recycle system. An NPDES permit may be required for any washwater discharge to a storm drain or receiving water after treatment. Contact the Ecology regional office for NPDES Permit requirements.
2. Designated wash areas must be well marked with signs indicating where and how washing must be done.
3. An NPDES permit may be required for any wash water discharge to a storm drain or receiving water after treatment. Contact Clark County for further information.

Oil changes and other engine maintenance cannot be conducted in the designated washing area.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Recycle the wash water.
2. Use phosphate-free biodegradable detergents when practicable.

AS A-14: Mobile Interior Washing Operations

This activity applies to you if you are engaged in washing of carpets and other interior items on a mobile site-to-site basis. The typical mobile fleet washing process includes use of machines that scrub and suck dirt and other particles with a wash water solution into a portable containment device with limited capacity. Stormwater and surface waters or groundwater may become contaminated if collected wash water is disposed outdoors between site visits. Wastewater from washing operations that is dumped into storm drains, on streets, in drainage ditches, and in other outdoor locations can contaminate water bodies with nutrients, suspended solids, and chemicals used in the cleaning process.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you engage in mobile interior washing activities.

1. Do not dispose of any wastewater from this activity outdoors or to a drain connected to the storm drainage system. This point must be clear to employees. Wastewater from mobile fleet washing operations may be permitted for sanitary sewer disposal if it does not contain high concentrations of toxic materials. Wash water can also be recycled.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

2. Label equipment with a message similar to “No wastewater can be discharged to a storm drain, drainage ditch, or to the ground.” In addition, label equipment with the proper wastewater disposal methods.

3. Do not dispose of sludges that are left in tanks, containers, or trucks outdoors or to a drain connected to the storm drainage system. Sludges must be disposed properly.

✓ *See BMP Information Sheet 2 for information on disposal options.*

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Limit the amount of water used in interior washing operations. This limits the amount of wastewater you need to worry about properly disposing.
2. Recycle the wash water.

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AS A-15: Pressure Washing of Buildings, Rooftops, and Other Large Objects

This activity applies to you if you are engaged in pressure washing of large, immobile objects, such as building facades and rooftops, on a site-to-site basis. Pressure washing can readily degrade water quality because the runoff and loosened solids typically travel directly into the storm drainage system. Wash water from pressure washing operations can be contaminated with suspended solids, heavy metals, and possibly other pollutants present on the objects being washed. Pressure washing of boats in boat yards, marinas, and dry dock areas is covered by a NPDES permit, administered by Ecology, so the BMPs listed below do not apply to pressure washing in these locations.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in pressure washing of large objects.

1. In situations where soaps, detergents, or other soluble treatments are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum, or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.

✓ See BMP Information Sheet 2 in Chapter 4 for information on disposal options.
2. If only water is used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
3. If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow to be absorbed into the ground, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.
4. An NPDES permit may be required for any wash water discharge to a storm drain or receiving water after treatment. Contact Clark County for further information.

5. Another option is to hire a mobile washer that collects and recycles water or complies with the above.

If the painted surface being pressure washed is painted with lead or other heavy metal-bearing paint (such as chromium or cadmium), consider using a commercial pressure washing service that can collect, test, and properly dispose of the wastewater.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. A catch basin insert, configured for debris removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

2. Recycle the wash water.

AS A-16: Truck or Rail Loading and Unloading of Liquid Materials

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

This activity applies to you if you receive shipments of bulk liquid materials by truck or rail and transfer those liquids into storage tanks or containers or handle the truck or rail loading of liquid materials from tanks. Spills and drips of these liquids can potentially contribute toxic organic compounds, oils and greases, nutrients, heavy metals, and abnormal pH to stormwater runoff.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in loading and unloading of liquid materials.

1. Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from rainfall when not in use. Drip pans must be cleaned periodically and drip-collected materials must be disposed of properly.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

2. Train employees in proper handling techniques during liquid transfers to avoid spills.
3. A significant amount of debris can accumulate at outside, uncovered loading/unloading areas. Sweep these areas frequently to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered for a period of time by containers, logs, or other material after the areas are cleared.
4. Report spills of significant quantities to Clark County.
5. Prepare and implement an Emergency Spill Cleanup Plan for the facility (BMPs for Spills of Oil Hazardous Substances) which includes the following BMPs:
 - Ensure the cleanup of liquid 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.
 - Ensure that an employee trained in spill containment and cleanup is present during loading/unloading.

6. In the case of loading from/unloading to marine vessels facilities and procedures for the loading or unloading of petroleum products must comply with Coast Guard requirements as specified in the Ecology's 2005 Stormwater Management Manual for Western Washington, Volume IV, Appendix IV-D R.5.
7. Consistent with Uniform Fire Code requirements and to the extent practicable, conduct unloading/loading in a manufacturing building or under a roof, lean-to, or other appropriate cover.
8. 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.
9. Large loading areas are frequently 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.
10. 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 will frequently be covered by material, or they should be placed on designated "alleyways" that are not covered by material, containers, or equipment.
11. Loading docks
 - Install and maintain overhangs or door skirts that enclose the trailer end to prevent contact with stormwater.
 - Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
 - Retain the necessary materials on site for rapid cleanup of spills.
12. Tanker Truck Transfer Areas
 - 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 spill containment sump, spill control oil/water separator, or other spill control device. The minimum spill retention time should be 15 minutes at the greater flow rate of the highest fuel dispenser nozzle throughput rate. Or the peak 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.
13. Rail Transfer Areas
 - Install a drip pan system within the rails to collect spills/leaks from tank cars and hose connections, hose reels, and filler nozzles.

14. Routine maintenance:

- Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.

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AS A-17: Fueling Operations

This activity applies to you if you refuel vehicles on the premises, whether a large-sized gas station or a single-pump maintenance yard installation. Stormwater runoff from fueling areas may be contaminated with toxic hydrocarbons, oils and greases, and heavy metals.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in fueling operations.

1. Cover the fueling area with an overhanging roof structure or canopy so that rainfall cannot come in contact with the fueling area.
 - ✓ *See BMP Information Sheet 3 in Chapter 4 for information on covering options. An exception to this requirement is granted for floating fuel islands on water, and oversized vehicles that can not maneuver under a roof.*
2. Pave the fueling area with portland cement concrete and contain the area to prevent uncontaminated stormwater from running on the area and carrying pollutants away.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment.*
3. Install and maintain a sump to contain spills prior to an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.
 - ✓ *See the BMP Information Sheet 8 in Chapter 4 for further information on oil/water separators.*
4. Routine maintenance:
 - Post signs to remind employees and customers not to top off the fuel tank when filling and signs that ban customers and employees from changing engine oil or other fluids at that location.
 - Store and maintain appropriate spill cleanup materials in a location known to all; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

5. If you cannot implement the above requirements on your site, consider ceasing your on-site fueling activities and take your vehicles to a fuel station that meets the requirements.
6. Train employees in proper handling techniques during fueling to avoid spills.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. Use absorbent pillows or similar absorbent materials in or around storm drain inlets on the property to filter oily runoff. These require frequent maintenance and close attention, but can be useful in short-term situations. Used absorbent materials containing oil must be picked up by a qualified disposal contractor.
2. A catch basin insert, configured for oil removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

3. For vehicles 10 feet in height or greater

- If a roof or canopy is impractical, the concrete fueling pad must be equipped with emergency spill control, which includes a shutoff valve for the drainage from the fueling area. The valve must be closed in the event of a spill. An electronically actuated valve is preferred to minimize the time lapse between spill and containment. Spills must be cleaned up and disposed of off site in accordance with BMPs for Spills of Oil and Hazardous Substances.
- The valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the sewer authority, or to oil removal treatment such as an American Petroleum Institute (API) or coalescing plate interceptor (CPI) oil/water separator, catch basin insert, or equivalent treatment, and then to a basic treatment BMP. Discharges from treatment systems to storm drains, surface water, or to the ground must not display ongoing or recurring visible sheen and must not contain a significant amount of oil and grease.

AS A-18: Engine Repair and Maintenance

This activity applies to you if you conduct engine repair and maintenance in vehicles and other equipment. It also applies to mobile vehicle maintenance operations, such as at construction sites. This common activity can lead to immediate stormwater contamination if it is not done in a controlled manner. This activity can contaminate stormwater runoff with toxic hydrocarbons, other toxic organic compounds, oils and greases, abnormal pH, and heavy metals. Related vehicle maintenance activities are covered under the following activity headings in this manual: “Painting, Finishing, and Coating of Vehicles, Products, and Equipment (A-22),” “Vehicle Washing and Steam Cleaning (A-13),” “Fueling Operations (A-17), and “Vehicle and Equipment Parking and Storage (A-31).”

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in engine and vehicle repair and maintenance.

1. Inspect all incoming vehicles, parts, and equipment that are stored temporarily outside for leaks.
2. Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid containing parts or removal or transfer of liquids.
3. Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered, nonleaking secondary containment system.
4. Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.
5. Do not pour/convey wash water, liquid waste, or other pollutants into storm drains or to surface water. Check with the local sanitary sewer authority for approval to convey to a sanitary sewer.
6. Do not connect maintenance and repair shop floor drains to storm drains or to surface water. To allow for snowmelt during the winter, a drainage trench with a sump for particulate collection can be installed and used only for draining the snowmelt and not for discharging any vehicular or shop pollutants.
7. If temporary work is being conducted outside, use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips. The collected drips and spills must be disposed, reused, or recycled properly.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

8. If the work is done on a regular basis at a stationary business location, move the activity indoors.
9. Conduct all maintenance and repair of vehicles and equipment in a building or other covered impervious containment area that is sloped to prevent run-on of uncontaminated stormwater and runoff of contaminated stormwater.
10. The maintenance of refrigeration engines in refrigerated trailers may be conducted in the parking area with due caution to avoid the release of engine or refrigeration fluids to storm drains or surface water.
11. Park large mobile equipment, such as log stackers, in a designated contained area.
12. Routine Maintenance:
 - Employees must be educated on proper handling and disposal of engine fluids.
 - Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures. Consider using reusable cloth rags to clean up small drips and spills instead of disposable towels. Reusable rags should be washed by an industrial laundry service. Do not clean them at home or at a coin-operated laundry business.
 - Sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. **Never** hose down the area to a storm drain.
 - Inspect all BMPs regularly, particularly after a significant storm. Identify and correct deficiencies to ensure that the BMPs are functioning as intended.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. Absorbent material such as pillows or booms can be used around storm drains or in catch basins to absorb oil and other substances. Used absorbent materials containing oil or other engine fluids must be picked up by a qualified disposal contractor.
2. A catch basin insert, configured for oil removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)
 - ✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

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3. Consider storing damaged vehicles in a building or other covered containment until all liquids are removed. Remove liquids from vehicles retired for scrap.
4. Clean parts with aqueous detergent-based solutions or nonchlorinated solvents, such as kerosene or high flash mineral spirits, and/or use wire brushing or sand blasting whenever practicable. Avoid using toxic liquid cleaners such as methylene chloride, 1,1,1-trichloroethane, trichloroethylene, or similar chlorinated solvents. Choose cleaning agents that can be recycled.
5. Recycle greases, used oil, oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic fluids, transmission fluids, and engine oils.
6. Do not mix dissimilar or incompatible waste liquids stored for recycling.

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AS A-19: Concrete and Asphalt Production at Stationary Sites

This activity applies to you if you mix raw materials on site to produce concrete or asphalt. It also applies to subsequent activities, such as pouring concrete structures, and making other concrete and asphalt products. Mishandling of raw materials in concrete production can introduce suspended solids and heavy metals to stormwater runoff and cause pH increases in receiving waters. In addition, stormwater pollution can result from washing of waste concrete from trucks, forms, wheelbarrows, buckets, and other equipment in the work area. The loose chunks of aggregate resulting from washing of equipment can easily reach storm drains, either in the wash water itself or in stormwater runoff. Asphalt production can introduce high concentrations of toxic hydrocarbons, other toxic organic compounds, oils and greases, and heavy metals to stormwater runoff. Asphalt emulsion and chunks of aggregate can easily wash off of equipment used in mixing and production in much the same way as concrete. Mobile concrete pouring and asphalt application are covered under a separate activity in this manual. Concrete production at mining sites is not covered by this activity.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in concrete and asphalt mixing and production:

1. Discharge all process water from production, pouring, and equipment cleaning activities to a sump, process water treatment or recycling system, or sanitary sewer system.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*
2. Contain the production and pouring area to prevent stormwater from entering the area and carrying pollutants away.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.*
3. Routine maintenance:
 - Sweep the production and pouring area weekly, if it is paved, to collect loose chunks of aggregate and raw material particles for recycling or proper disposal. Never hose down the area to a storm drain.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. Use an oil control device in the catch basins to treat stormwater runoff.
2. Cover the production area with provisions for prevention of stormwater run-on.
 - ✓ *See BMP Information Sheets 3 and 5 in Chapter 4 for information on covering and run-on prevention options.*
3. Pave the mixing, production and/or pouring area(s) with a slope to a central collection area. For concrete production and pouring activities, a sump drain should not be provided because it would be quickly clogged with hardened concrete. It may be wise to segregate the mixing and pouring area from the curing area because wastewater from curing applications could be collected by a drain. By sloping the pavement to a central location, loose chunks of concrete or asphalt aggregate can be collected more easily and recycled or disposed of properly.

AS A-20: Concrete and Asphalt Production at Temporary Sites

This activity applies to you if you apply asphalt and/or pour concrete for building construction; road construction; 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. Asphalt application can contribute high concentrations of toxic hydrocarbons, other toxic organic compounds, oils and greases, and heavy metals to stormwater runoff. Concrete pouring can contribute suspended solids and heavy metals to stormwater runoff, and cause pH increases in receiving waters.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in concrete pouring and asphalt application at temporary sites.

1. Use drip pans, ground cloths, and perhaps even heavy cardboard or plywood wherever concrete, asphalt, and asphalt emulsion chunks and drips are likely to fall unintentionally, such as beneath extraction points from mixing equipment.
2. Place storm drain covers or similarly effective containment devices over all nearby drains at the beginning of the work day. All accumulations of runoff, aggregate chunks, and other solids must be collected with a shovel or other mechanism for proper disposal at the end of the work day (or more frequently) prior to removing the containment device(s). Drain covers and other containment devices are commercially available.
3. Contain and collect the slurry from exposed aggregate washing, where the top layer of unhardened concrete is hosed or scraped off to leave a rough finish. Use a storm drain cover or other containment device, as mentioned above. All collected runoff must be properly disposed.

✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

4. **Concrete and concrete pumping vehicles shall not under any circumstances discharge any concrete, slurry, or rinse water into street gutters, storm drains or drainage ditches.**

Designate a wash-out area on site where cleaning of application and mixing equipment can take place and where the rinse water is controlled. It is also acceptable to dispose of rinse water and slurry in a hole in the ground big enough to contain the slurry and rinse material. Commercial products and services are also available for concrete, slurry, and rinse water disposal.

5. Routine maintenance:

- Sweep the pouring area at the end of each day to collect loose aggregate chunks and dust. Never hose down the area to a storm drain.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. If possible, portable asphalt mixing equipment should be covered by an awning or other simple structure while raining to avoid contact with rainfall.
2. A catch basin insert configured for sediment removal, may remove some of the pollutants in runoff from this activity. This is especially useful if the activity must proceed on rainy days. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-21: Manufacturing and Post-Processing of Metal Products

This broad activity group applies to mills, foundries, and fabricators that manufacture, or post-process metal products at stationary sites. It does not apply to temporary activities such as welding or pipe cutting that are conducted in the field. A variety of activities, such as machining, grinding, soldering, cutting, welding, quenching, cooling, and rinsing may take place. Wastewater from these operations may be contaminated with toxic organic compounds, heavy metals, oils and greases, abnormal pH, and suspended solids. Stormwater runoff from areas where these activities occur can be contaminated with these same pollutants as well. These businesses may be required to apply for and obtain a NPDES permit from Ecology. See Chapter 5 for a discussion of NPDES requirements. Note that painting, finishing, and coating of metal products is covered under a different activity in this manual.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in manufacturing or processing metal products.

1. Discharge process wastewater from this activity to a sanitary sewer, holding tank, or process treatment system.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*
2. Routine Maintenance:
 - Sweep the pouring area at the end of each day to collect metal fragments and debris. Never hose down the area to a storm drain.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control:

1. Cover the activity area(s) to prevent rainfall from entering the area, and to reduce the amount of runoff that has to be detained or treated.
 - ✓ *See BMP Information Sheet 3 in Chapter 4 for information on covering options.*

2. Use a catch basin insert configured to remove sediment to capture stray metal particles in runoff. Clean regularly to prevent "washing" of trapped particles and conversion to highly toxic dissolved state. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)
 - ✓ *See BMP Information Sheet 9 in Chapter 4 for information on inserts.*

AS A-22: Painting, Finishing and Coating of Vehicles, Products and Equipment

This activity applies to you if you apply primers, paints, finishes, and coatings to vehicles, furniture, manufactured products, and other objects. This includes car detailing work. It also includes preparation work such as sanding and blasting. BMPs for painting of buildings are given in this manual under “Building Repair, Remodeling, and Construction (A-29).” BMPs for painting and finishing of boats and other marine objects are described under “Boat Building, Maintenance and Repair (A-30).” BMPs for storage of paints and materials are described under “Storage of Liquid Materials in Portable Containers (A-2).” Stormwater runoff from work areas where this activity occurs may be contaminated with toxic hydrocarbons and other organic compounds, oils and greases, heavy metals, and suspended solids.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are involved in painting, finishing, or coating of vehicles, products, and equipment.

1. Enclose all work while using a spray gun or conducting sand blasting (unless too large) according to Southwest Clean Air Agency, OSHA, and WISHA requirements.
 - ✓ *See Chapter 5 for information on Southwest Washington Air Pollution Control Authority requirements, and also for fire code implications.*
2. Do not conduct spraying, blasting, or sanding activities over open water or where wind may blow paint into water.
3. Wipe up spills with rags and other absorbent materials immediately.
4. Use a storm drain cover, filter fabric, or similarly effective runoff control device if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the workday. Collect contaminated runoff and solids and properly dispose of such wastes before removing the containment device(s) at the end of the work day.
5. Use a ground cloth, pail, drum, drip pan, tarpaulin, or other protective device for activities, such as paint mixing and tool cleaning outside or where spills can contaminate stormwater.
6. Properly dispose of all wastes and prevent all uncontrolled releases to the air, ground, or water.

7. Clean brushes and tools covered in 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.
8. Store toxic materials under cover (tarp, etc.) during precipitation events and when not in use to prevent contact with stormwater.
9. Routine maintenance:
 - Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
 - Train employees in careful application of paints, finishes, and coatings to reduce misuse and overspray.
 - For outside work, use ground cloths and/or drip pans in locations where paints, finishes, and other liquid materials are mixed, carried, and applied.
 - Sweep the area at the end of each day. Never hose down the area to a storm drain.
 - Wipe up spills with rags and other absorbent materials immediately. Sweep the area at the end of each day. Never hose down the area to a storm drain or receiving water or conveyance ditch to receiving water. Collect any hose water generated and convey to appropriate treatment and disposal.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. 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.
2. Recycle paint, paint thinner, solvents, pressure washwater, and any other recyclable materials.
3. Use efficient spray equipment such as electrostatic, air-atomized, high volume/low pressure, or gravity feed spray equipment.
4. Purchase recycled paints, paint thinner, solvents, and other products if feasible.

AS A-23: Wood Treatment and Preserving

This activity applies to you if you are involved in wood treatment operations that either are performed outdoors or include storage of freshly treated wood materials outdoors. It includes permanent sites as well as temporary (or mobile) sites. Some of these operations are unique to large-scale commercial wood preserving and therefore require a specific set of BMPs. Because materials used in wood treatment and preserving are extremely toxic, this activity is segregated from similar activities discussed elsewhere in this manual. Stormwater runoff from wood treatment and preserving activities may be contaminated with toxic hydrocarbons and other organic compounds, heavy metals, oils and greases, and suspended solids. Large-scale commercial operations are required to have a stormwater NPDES permit, administered by Ecology. See Chapter 5 for more information on NPDES permit requirements. The BMPs listed below should be used to complement NPDES compliance measures at large-scale wood treatment operations, but do not substitute for the permit requirements.

Small-scale wood treatment operations, such as building contractors, do not typically require an NPDES permit, and therefore must follow the measures listed below.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in wood treatment and preserving.

1. Use ground cloths or drip pans to collect drips.
2. Store portable containers of wood preservative compounds indoors or in a covered location when not in use.

✓ *See AS A-3 “Storage of Liquid Materials in Portable Containers.”*

In addition to the above BMPs, the following BMPs are required for large-scale commercial operations.

3. Hold dipped lumber over dip tanks until dripping ceases (if applicable).
4. Dedicate equipment that is used for treatment activities to prevent the tracking of treatment chemicals to other areas on the site.
5. Eliminate nonprocess traffic on the drip pad. Scrub down nondedicated lift trucks on the drip pad.

6. Immediately remove and properly dispose of soils with visible surface contamination (green soil) to prevent the spread of chemicals to groundwater and/or surface water via stormwater runoff.
7. Store treated lumber in a covered and paved area for at least 24 hours following treatment (longer during cold weather) so that rainfall does not come in contact with the treated products until they are fully dry. Contain the storage area to restrict stormwater from running into the covered area.
8. Elevate stored, treated wood products to prevent contact with stormwater run-on and runoff.
9. If any wood is observed to be contributing chemicals to the environment in the treated wood storage area, relocate it on a concrete chemical containment structure until the surface is clean and until it is drip-free and surface dry.
10. Contain the wood treatment equipment and work areas with impervious surfaces. Slope and drain areas around dip tanks, spray booths, retorts, and any other process equipment in a manner that allows return of treatment chemicals to the wood treatment process, and prevents stormwater from entering the area and carrying pollutants away.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment and run-on prevention.*
11. Separate clean stormwater from process water. Ensure that all process water is conveyed to an approved treatment system.
12. Seal any holes or cracks in the asphalt areas that are subject to wood treatment chemical contamination.
13. Routine maintenance:
 - Cover outdoor dip tanks when not in use.

Additional BMPs

The following BMPs are not required but they can provide improved pollution control.

1. Consider using preservative chemicals that do not adversely impact receiving surface and groundwater.

AS A-24: Commercial Composting

This activity applies to you if you are engaged in receiving and composting wastes as a commercial service. This refers to businesses that typically have several compost piles requiring large open areas. Composting can contribute nutrients, coliform bacteria, and suspended solids to stormwater runoff. All commercial composting operations must satisfy Clark County Health Department requirements. See Chapter 5 for a summary of Health Department solid waste regulations. In addition, contact the Department of Ecology, which is also developing specific drainage requirements for commercial composting operations. The BMPs listed below are intended to complement other regulatory requirements.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in composting wastes.

1. Ensure that wastes do not contain dangerous materials that belong in a hazardous waste facility, or solid wastes that do not break down by composting. Employees must be trained to screen these materials in incoming wastes.
2. Contact other federal, state, and local agencies with environmental or zoning authority for applicable permit and regulatory information. Local health departments are responsible for issuing solid waste handling permits for commercial compost facilities.
3. Apply for coverage under the General Permit to Discharge Stormwater Associated with Industrial Activities if the facility discharges stormwater to surface water or a municipal stormwater system. If all stormwater from the facility infiltrates into the surrounding area, the general permit is not required.
4. Develop a plan of operations as outlined in the Compost Facility Resource Handbook, Publication #97-502
5. Locate composting areas on impervious surfaces.
6. Store finished compost in a manner to prevent contamination of stormwater.

7. Collect and convey all runoff from composting operations to a sanitary sewer, holding tank, or on-site treatment system.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options. If biochemical oxygen demand (BOD) or fecal coliform bacteria are expected to be significant pollutants in compost runoff, drainage must be routed to a sanitary sewer or holding tank, regardless of whether a process treatment system is used.*
8. Contain the compost pile drainage. Containment of compost drainage will probably be best accomplished with a dike or berm, or with intercepting drains placed on the down slope side of the compost area.
 - ✓ *See BMP Information Sheet 5 in Chapter 4 for information on containment. Check with the Clark County Health Department for full compliance.*
9. Ponds used to collect, store or treat leachate and other contaminated waters associated with the composting process must be lined to prevent groundwater contamination. Apply All Known Available and Reasonable Methods of Prevention and Treatment (AKART) to all pond liners, regardless of the construction materials.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Clean up debris from yard areas regularly.
2. Locate stored residues in areas designed to collect leachate.
3. Limit storage times of residues to prevent degradation and generation of leachate.
4. Consider using leachate as makeup water in early stages of the composting process. Since leachate can contain pathogenic bacteria, care should be taken to avoid contaminating finished product or nearly finished product with leachate.
5. A catch basin insert, configured for debris and sediment removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)
 - ✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-25: Chemical Applications – Other Than For Landscaping

This activity applies to you if you use pesticides, herbicides, or other chemicals for such purposes as removing moss from rooftops, killing nuisance rodents, or use fungicides to preserve patio decks. Over application of pesticides in these situations can result in stormwater contamination in much the same way as in landscaping activities. The pollutants of concern for stormwater management are toxic organic pesticide compounds, oils, and heavy metals. People engaged in this activity must comply with structural pesticide applicator regulations. See Regulation 14 in Chapter 5 for details on these regulations. The BMPs listed below are intended to complement other regulations. Application of pesticides for landscaping purposes must follow the BMPs discussed under “Landscaping Activities (A-26).”

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you apply chemicals for non-landscaping purposes.

1. Avoid excessive application. Follow manufacturers’ application guidelines and label directions. Chemicals must **never** be applied outside if it is raining.
2. Use the smallest amount of chemicals necessary to accomplish the job.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Manual pest-control strategies such as physically scraping moss from rooftops, using high-pressure sprayers to remove moss, and using rodent traps should be attempted.
2. Integrated pest management (IPM), a comprehensive approach to the use of pesticides that minimizes pesticide application and stresses selection of proper products and tailored application rates, is the most effective BMP measure that can be taken. IPM is applicable to businesses that frequently apply pesticides.

✓ *See BMP Information Sheet 6 in Chapter 4 for information on IPM.*

3. Educate employees about the pollution they can cause if they do not follow simple rules of application.
4. Select the least toxic chemical application that can accomplish the job.

CHAPTER 3.
STORMWATER BEST MANAGEMENT PRACTICES
FOR SPECIFIC ACTIVITIES

AS A-26: Landscaping Activities

This broad activity encompasses all aspects of landscaping, from small-scale yard maintenance to large-scale commercial landscaping businesses. It includes vegetation removal, herbicide and insecticide application, fertilizer application, watering, and other gardening and lawn care practices. Stormwater runoff from areas that have been subject to herbicide, insecticide, or fertilizer application or extensive cutting may be contaminated with toxic organic compounds, heavy metals, oils, suspended solids, nutrients, or coliform bacteria, and may cause biochemical oxygen demand.

Landscaping activities related to golf courses should refer to King County's 1993 Washington Golf Course BMP Manual. The BMPs listed below are intended to complement other regulatory requirements. See "Storage of Pesticides and Fertilizers (A-5)" and "Storage of Liquid Materials in Portable Containers (A-3)."

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in landscaping activities.

1. Do not apply any chemicals (insecticide, herbicide, or fertilizer) within 100 feet of surface waters, including wetlands, ponds, streams, sloughs or any drainage ditch or channel that leads to open waters, unless the application is approved and permitted by the state.
2. Follow manufacturers' recommendations and label directions. Pesticides must **never** be applied if it is raining or immediately before expected rain. Do not apply insecticides within 100 feet of surface waters, such as lakes, ponds, wetlands, and streams. (This buffer distance is specified in Ecology's Stormwater Management Manual).
3. Dispose of grass clippings, leaves, limbs, sticks, or other collected vegetation by composting, as garbage, or by burning (where allowed). Do not dispose of collected vegetation into waterways or storm drainage systems.
4. 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.
5. Avoid planting Noxious Plant Species or Species of County Concern, particularly near wetlands, streams and lakes. Contact Clark County Weed Control for information on these types of plants at (360) 254-2034.

6. 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 (*Stormwater Management Manual for Western Washington*, Appendix IV-D R.7)
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.
8. Mix the pesticides and clean the application equipment in an area where accidental spills will not enter surface or ground waters, and will not contaminate the soil.
9. 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 the paved areas to a storm drain or conveyance ditch.
10. Clean up any spilled pesticides and ensure that the pesticide-contaminated waste materials are kept in designated covered and contained areas.
11. The pesticide application equipment must be capable of immediate shutoff in the event of an emergency.
12. All sensitive areas, including wells, creeks and wetlands, must be flagged prior to spraying.
13. Ecology or Clark County may require public posting of area prior to application.
14. Integrated pest management (IPM), a comprehensive approach to the use of pesticides, is the most effective BMP measure that can be taken for herbicide, insecticide, and fungicide use.

✓ *See BMP Information Sheet 6 in Chapter 4 for information on IPM.*
15. Use slow-release fertilizers such as methylene urea, IDBU, or resin-coated fertilizers when appropriate, generally in spring. Use of slow-release fertilizers is especially important in areas with sandy or gravelly soils.
16. Properly trained persons should apply all fertilizers. At commercial and industrial facilities, fertilizers should not be applied to grass swales, filter strips, or buffer areas that drain to sensitive water bodies unless approved by the County.

17. Routine Maintenance:

- Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with proper spill cleanup procedures.
- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Aerate lawns regularly in areas of heavy use where the soil tends to become compacted. Aeration should be conducted while the grasses in the lawn are growing most vigorously. Remove layers of thatch greater than 3/4-inch deep.
- To reduce the stress caused by mowing, set the mowing height at the highest acceptable level and mow at times and intervals designed to minimize the stress on the turf. Generally, mowing only 1/3 of the grass blade height will prevent stressing the turf.
- Fertilizers should be applied in amounts appropriate for the target vegetation and at the time of the year that minimizes losses to surface and ground waters. Do not fertilize during a drought or when soil is dry. Alternatively, do not apply fertilizers within three days prior to predicted rainfall.
- Time fertilizer application to periods of maximum plant uptake. Generally, fall and spring applications are recommended, although Washington State University turf specialists recommend four fertilizer applications per year.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control

1. Use mechanical methods of vegetation removal rather than applying herbicides.
2. Conduct mulch-mowing whenever practicable
3. Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface. Determine the proper fertilizer application for the types of soil and vegetation involved. Soil should be tested for the correct fertilizer usage.
4. Use mechanical methods of vegetation removal rather than applying herbicides.
5. An effective measure that can be taken to reduce pesticide use, excessive watering, and removal of dead vegetation involves careful soil mixing and layering prior to planting. A topsoil mix or composted organic material should be rototilled into the soil to create a transition layer that encourages deeper root systems and drought-resistant plants. This practice can improve the health of planted vegetation, resulting in better disease resistance and reduced watering requirements. Use at least an 8-inch "topsoil" layer with at least 8 percent organic matter to provide a sufficient vegetation-growing medium.

6. Be sure to select the most appropriate turfgrass mixture for your climate, soil type, and anticipated use. The local Cooperative Extension office can offer advice on which types are most suitable.

AS A-27: Clearing and Grading of Small Construction Sites

This activity applies to you if you clear, grade, or prepare land for construction. Stormwater runoff from cleared and graded construction sites can be loaded with suspended sediments and attached pollutants such as oils and greases, toxic hydrocarbon and herbicide compounds, heavy metals, and nutrients. Control of this runoff at the source can prevent large pollutant loadings from ever harming receiving waters. Prior to clearing, grading, and preparation activities for land disturbing activities greater than 2000 square feet, the Clark County Community Development Department must be contacted. You may need to follow the procedures for construction site erosion and sediment control outlined in the Clark County Stormwater and Erosion Control Ordinance and the Ecology Manual.

The following requirements apply to all projects.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in clearing or grading of construction sites.

1. Construct a vehicle access route covered with crushed rock to prevent tracking mud and sediment onto roads.
2. Avoid tracking dirt of the site on vehicles by not driving vehicles on to the cleared area. If sediment is tracked onto roads, it should be removed at least as often as at the end of the work day using shovels or sweeping. Never wash sediment into storm drains or ditches.
3. Exposed soils should be stabilized using sod, vegetation, mulch, other covers, or ground base in areas to be paved. From October 1 through April 30, exposed soils must be covered within two days. Exposed soils must be covered within seven days between May 1 and September 30.
4. Protect adjacent properties from sediment washed off the project by using erosion prevention or sediment trapping BMPs.
5. Routine Maintenance:
 - BMPs need to be inspected and maintained to remain effective.
 - ✓ *Contact the Clark County Building Division or Development Services Division at (360) 397-2375 for more detailed information about erosion and sediment controls.*

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control:

- 1.** A catch basin insert, configured for debris and sediment removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-28: Demolition of Buildings

This activity applies to the removal of existing buildings by controlled explosions, wrecking balls, or manual methods, and subsequent clearing of the rubble. Demolition of buildings can introduce a variety of pollutants into stormwater runoff, primarily suspended solids, but also toxic organic compounds and heavy metals.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in building demolition.

1. Spray water throughout the site to help control wind-blowing of fine materials such as soil, concrete dust, paint chips, and metal chips. The amount of water must be controlled so that runoff from the site does not occur, yet dust control is accomplished. Oils must never be used for dust control.
2. Place filter fabric or a similarly effective device in all nearby drains to prevent particles and solids from entering the storm drainage system. Filters shall be placed at the beginning of the work day and the accumulated materials collected and disposed properly before removing them at the end of the work day. Filter fabric and other filter devices are commercially available.
3. Sweep surrounding street gutters, sidewalks, driveways, and other paved surfaces at the end of each work day to collect and properly dispose of loose debris and garbage, **Never** hose down the area to a storm drain.
4. If vegetation clearing or grading are being done, follow requirements of AS A-27, Clearing and Grading of Small Construction Sites.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. A catch basin insert, configured for sediment and debris removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for information*

2. Recycling of reusable building materials is recommended.

- ✓ *Call the Clark County Solid Waste Program at (360) 397-6118, ext. 4352 for more information on recycling reusable building materials and demolition debris.*

3. Recycling of demolition debris is recommended.

AS A-29: Building Repair, Remodeling, and Construction

This activity refers to you if you are engaged in common on-site labor activities associated with construction of buildings and other structures, remodeling of existing buildings and houses, painting of building exteriors, and general exterior building repair work. Stormwater runoff from building repair, remodeling, and construction work can be contaminated with toxic hydrocarbons in solvents, other toxic organic compounds, suspended solids, heavy metals, abnormal pH, and oils and greases. Concrete pouring is covered under “Concrete and Asphalt Production at Temporary Sites (A-20).” See sediment and erosion control requirements under “Clearing and Grading of Small Construction Sites, A-27”.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in building repair, remodeling, and construction.

1. Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
2. Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
3. Use a ground cloth or oversized tub for activities, such as paint mixing and tool cleaning.
4. Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

✓ *See BMP Information sheet 2 in Chapter 4 for information on disposal options.*
5. Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin.

This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day. A combination of a wet vacuum and brooms and dustpans can be used to collect accumulations of dirty runoff. Drain covers, filter fabric, and other containment devices are commercially available if effective runoff control cannot otherwise be provided.

If you need to de-water an excavation site, you must filter the water before discharging to a catch basin or off site. Water should be directed through hay bales and filter fabric or other sediment filters or traps.

6. Routine maintenance:

- Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with proper spill cleanup procedures.
- Sweep the area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.
- Store toxic material under cover during rain storms and when not in use (such as overnight). A cover would include tarps or other temporary cover material.

✓ *See AS A-3 on “Storage of Liquid Materials Portable Containers.”*

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control:

1. Recycle or reuse left over materials.

✓ *Call the Clark County Solid Waste Program at (360) 397-6118 ext. 4352 for more information on how to recycle reusable building materials or demolition debris.*

2. A catch basin insert, configured for debris and sediment removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-30: Boat Building, Maintenance, and Repair

This activity group applies to mobile operations, onshore repair facilities, and on-water fueling and repair operations that are not covered in other activity categories. The variety of practices grouped into this activity can collectively contaminate stormwater and surface water bodies with toxic organic compounds, oils and greases, heavy metals, nutrients, suspended solids, and abnormal pH. Many related businesses have a NPDES permit under Ecology's General Permit for Boat Building and Repair Facilities. The BMPs discussed below are similar to those listed in the NPDES permit and apply to areas not covered by a NPDES permit. See Chapter 6 for additional information and check with boat yards and marinas for other BMPs they have developed.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in boat building, mooring, maintenance, and repair, and are not covered by the NPDES Permit for Boat Building and Repair Facilities.

1. Move maintenance and repair activities onshore if possible. This action reduces some of the potential for direct pollution on water bodies.
2. Shelter any blasting and spray painting activities by hanging wind blocking tarps to prevent dust and overspray from escaping.

✓ *See Chapter 5 for details on Southwest Clean Air Agency limitations.*
3. Outside spray painting, blasting, or sanding activities are prohibited during windy conditions that render containment ineffective.
4. Use ground cloths for collection of drips and spills in painting and finishing activities. Use plastic or tarpaulin barriers beneath the hull for all activities, and between the hull and drydock walls when on land, to contain and collect spent materials.
5. Do not burn paint or use spray guns on topsides or above decks.
6. Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers properly.
7. Drain oil filters before disposal or recycling.

8. Store cracked batteries in a covered secondary container.
9. Immediately repair or replace leaking connections, valves, pipes, hoses, and equipment that may cause the contamination of stormwater.
10. Immediately clean up any spillage on dock, boat, or ship deck areas and dispose of wastes properly
11. Convey sanitary sewage to pump-out stations, portable on-site pump-outs, commercial mobile pump-out facilities, or other appropriate onshore facilities.
12. Collect bilge and ballast water that has an oily sheen on the surface for proper disposal rather than dumping in water or on land.
 - ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options. Several companies are available for bilge pump-out services. The problem can possibly be avoided if oil-absorbent pads are used to capture the oil in the bilge water before pumping. If pads are used, they must be recycled or properly disposed.*
13. Perform paint and solvent mixing, fuel mixing, and similar handling of liquids on shore, to avoid spillage directly in surface water bodies. Use drip pans, drop cloths, tarpaulins, or other protective devices unless working in impervious, contained, and covered areas.
14. Collect and properly dispose of wash water from washing painted boat hulls. Consider taking the boat to a local boat yard that is equipped to collect and treat wash water.
15. Direct deck drainage to a collection system sump for settling and/or additional treatment.
16. Apply source-control BMPs given in this ordinance when appropriate for other activities conducted at the marina, boat yard, or port facility.
17. Routine Maintenance:
 - Store and maintain appropriate spill cleanup materials in a location known to all and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
 - Sweep maintenance yard areas, docks and boat ramps weekly to collect sandblasting material, paint chips, oils, and other loose debris. Never hose down the area to the water or a storm drain.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Boat construction and structural repair activities should be covered.
2. A tarp should be placed above the water surface underneath the work area on boats or docks to collect drips, spills, paint chips, and loose solids when work is performed over water.
3. All used oil and oil filters should be recycled. Most marinas now offer used oil recycling services.
4. No soaps or detergents of any kind should be used to wash the topsides of boats where the wash water will enter storm drains, streams, wetlands or lakes.
5. Use sanders that have dust-containment bags.

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AS A-31: Vehicle and Equipment Parking and Storage

This activity applies to all types of parking lots (commercial, public, and private), retail store parking lots, fleet vehicle lots and yards (including rent-a-car lots and car dealerships), equipment sale and rental lots, and parking lot driveways. Stormwater runoff from these sites can be contaminated with toxic hydrocarbons and other organic compounds, oils and greases, heavy metals, nutrients, and suspended solids.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you have parking lots and driveways:

1. An oil removal system, such as an API or CP oil and water separator, catch basin filter, or equivalent BMP approved by the local jurisdiction, is applicable for parking lots meeting the threshold vehicle traffic intensity level of a *high-use site*.

Vehicle High-Use Sites

Establishments subject to vehicle high-use intensity have been determined to be significant sources of oil contamination of stormwater. Examples of potential high-use areas include customer parking lots at fast food stores, grocery stores, taverns, restaurants, large shopping malls, discount warehouse stores, quick-lube shops, and banks. If the pollution generating impervious surface (PGIS) for a high-use site exceeds 5,000 square feet in a threshold discharge area, then an oil control BMP from the Oil Control Menu is necessary. A high-use site at a commercial or industrial establishment has one of the following characteristics.

- Is subject to an expected average daily vehicle traffic (ADT) count equal to or greater than 100 vehicles per 1,000 square feet of gross building area: or
- Is subject to storage of a fleet of 25 or more diesel vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.).(Gaus/King County, 1994)

2. Routine Maintenance:

- Sweep parking lots, storage areas, and driveways at least once per month to collect dirt, waste, and debris. Do not hose down the area to a storm drain.
- If washing of the parking lot occurs, wash water must be discharged to a sanitary sewer or other treatment system. There are services that will clean parking lots and collect water for off-site disposal.

✓ *See BMP Information sheet 2 in Chapter 4 for information on disposal options.*

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Encourage employees to carpool or use public transit through incentives.
2. Encourage customers to use public transit by rewarding valid transit pass holders with discounts.
3. A catch basin insert, configured for oil removal, may remove some of the pollutants in runoff from this activity. (Catch basin inserts require frequent maintenance to be effective. Carefully consider this when making your decisions.)

✓ *See BMP Information Sheet 9 in Chapter 4 for more information.*

AS A-32: Sidewalk Maintenance

This activity applies to you if you have sidewalks. Litter accumulation on sidewalks can contribute suspended solids to stormwater runoff; runoff from sidewalks crossing driveways may also have hydrocarbon, oil and grease, and heavy metal contaminants. If weed killers are used on sidewalks, toxic pesticide compounds, oils, and heavy metals may also be introduced into stormwater. If crack sealants or surface coatings are applied, toxic hydrocarbons, oils and greases, and heavy metals may be contributed to stormwater runoff. Sidewalks and driveways are important areas to target for stormwater pollution control because they typically drain directly to stormwater conveyance facilities. Note that BMPs for driveways associated with parking lots are described under “Vehicle and Equipment Parking and Storage (A-31).”

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are engaged in sidewalk maintenance.

1. Sweep sidewalks at least once a month to collect loose dirt and debris rather than pushing it into the street or gutter or hosing it down. Collected materials must be disposed of as regular garbage.
2. Conduct spot stain removal instead of washing entire sidewalk. Do not use soaps and detergents to wash down sidewalks.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Use deicing salts and sands only when snow or ice is present (not as a preventive measure) and apply sparingly. Shoveling of snow is always preferred to dumping excessive amounts of deicing materials in an effort to avoid shoveling. If deicing salts are used, the residues and remaining granules should be swept up when the snow and ice has melted, and reused or disposed of in your garbage.

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AS A-33: Swimming Pool and Spa Cleaning and Maintenance

This activity applies to all municipal swimming pools, commercially owned swimming pools, and commercially owned spas, including Health Department -regulated facilities (general and limited use). Pools and spas at hotels, motels, apartment and condominium complexes, and other private locations, other than single-family residences, are also covered here. Older pools and spas must comply with these provisions as well. Improper drainage of these pools can lead to nutrients, suspended solids, chlorine, and abnormal pH entering the surface water environment. Chemicals used in pool and spa maintenance can also contaminate stormwater if they are not stored properly.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required of all businesses, municipalities, and multiple-family residential complexes engaged in swimming pool and spa cleaning and maintenance.

1. Dechlorinate pool and spa water if it is to be discharged to the ground. Neutralizing chemicals are available for this. Letting the pool or spa “sit” with no neutralizing chemicals may reduce chlorine levels; the facility should not be used during this period. Test kits should be used to determine disinfectant concentrations. State law allows discharges of pool water to the ground with a chlorine level of up to 3 ppm. However, the water must not cross property lines, and a satisfactory means for distributing the water to the ground must be used so there is no runoff. Discharges of pool and spa water to a water body are not allowed.
2. Regardless of the sanitizing agent used (chlorine, bromine, or ozone), all pool and spa drainage must go to a sanitary sewer or water treatment system if it cannot be dechlorinated sufficiently. If a sanitary sewer is available, all Health Department -regulated facilities are required to be connected for draining and backwash. Prior to draining, the local sewer agency must be notified, as there are concerns with the volume of discharge and disinfectant levels. If the pool or spa does not have a drain to accommodate this, water will have to be pumped or drained to a sanitary sewer or water treatment system inflow pipe connection.

If a sanitary sewer is not available, do not discharge pool or spa water to a septic system, as it may cause the system to fail. Alternative draining and backwash procedures must be approved by the Clark County Health Department in this situation.

3. Discharges of swimming pool and spa water to the storm sewer system are allowed only when the discharge is dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the storm sewer system. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the storm sewer system.

4. Diatomaceous earth (commonly used as a filtering agent in pools) cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.

Additional BMPs

The following BMPs are not required, but they can provide improved pollution control.

1. Managers of pools and spas located in sensitive areas or adjacent to shorelines should check with the Clark County Community Development Department at (360) 397-2375, or the Clark County Clean Water Program at (360) 397-6118, ext. 4392 to determine if other code requirements apply.
2. Provide drip pans or buckets beneath drain pipe connections to catch leaks. This will be especially pertinent if pool or spa water that has not been dechlorinated is pumped through piping to a discharge location.
3. Hire a professional pool-draining service to collect all pool water for off-site disposal.

AS A-34: Keeping Animals in Controlled Areas

This activity applies to outside kennels, fenced pens, and other animal management areas that do not involve livestock. In other words, it includes all types of animal maintenance practices other than keeping livestock in stables, fields, and pastures. This activity does not cover sheep, pigs, horses, cows, goats, and other hooved animals. Stormwater runoff from cage areas, pens, and yards can contain fecal coliform bacteria, nutrients, and suspended solids.

Minimum Requirements

The following Best Management Practices (BMPs) for water quality protection, or equivalent measures, methods, or practices, are required if you are engaged in management of animals other than livestock.

1. 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.
2. If animals are not leashed or in cages, the area where animals are kept must be surrounded by a fence or other means that prevents animals from moving away from the controlled area where BMPs are used.
3. Routine Maintenance:
 - Sweep and clean animal keeping areas weekly to collect and dispose of droppings, uneaten food, and other stray particles. Never hose down the area to a storm drain.
 - ✓ *For more information, contact the Clark County Animal Control Division at (360) 397-2375, extension 2488.*

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AS A-35: Keeping Animals in Stables, Pens, Pastures or Fields

This activity applies to management of all types of livestock, including cows, horses, and other hooved animals. Stormwater runoff from areas where livestock are kept may contain coliform bacteria and nutrients from manure. Suspended solids may be present in runoff from areas that are eroding because of overgrazing and stream bank trampling. The Clark County Habitat Conservation Preservation Ordinance under Chapter 40.440 has been amended to include specific requirements for livestock management near streams. See Chapter 5 for a summary of the Chapter 40.440 requirements. Chapter 13.26A, Water Quality, prohibits discharge of animal wastes and other contaminants to streams. BMPs need to be used to prevent water pollution by livestock.

Requirements for keeping livestock in stables, pens, pastures, or fields are under development.

For BMPs that address general livestock management, landowners and pasture managers should refer to the Washington State University/Clark County Cooperative Extension, and Clark County Conservation District for information. For information on available County assistance for sites in Lacamas Lake basin or in the East Fork Lewis River basin, contact (360) 397-6118, ext. 4868.

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AS A-36: Logging

This activity covers logging activities that fall under the classification 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 forest cutting for construction of homes. The stormwater pollution concern with this logging activity is erosion due to timber cutting and understory clearing. Logging activities can introduce large concentrations of suspended solids and nutrients into stormwater runoff from bare soil and vegetation debris, as well as toxic organic compounds, oils and greases, and heavy metals from vehicles and pesticides.

The Clark County Habitat Conservation Ordinance has requirements for Class IV logging near streams. Class IV logging may also have requirements under the Clark County Stormwater and Erosion Control Ordinance. Additionally, log yard operations are required to apply for coverage under the State Department of Ecology's NPDES baseline general permit. Therefore, there are no additional requirements for logging in this manual.

Contact the Clark County Department of Community Development at (360) 397-2375 for more information on the County requirements for logging and land clearing.

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AS A-37: Mining and Quarrying of Sand, Gravel, and Other Materials

This activity applies to surface excavation and on-site storage of sand, gravel, minerals, peat, clay, rock, and other materials that are mined in unincorporated Clark County. Mining operations have the potential to introduce a variety of pollutants into runoff, including nutrients, suspended solids, abnormal pH, and metals. Rainfall can easily erode cut slope faces and stockpiled materials, readily causing stormwater contamination problems.

Ecology regulates all mining activities in the state for protection of water quality and ,thus, is the authority for enforcement of stormwater requirements related to water quality protection. Ecology has developed a NPDES permit for “Sand and Gravel Operations, Rock Quarries, and Similar Mining Facilities, Including Stockpiles of Mined Materials, Concrete Batch Operations and Asphalt Batch Operations.” Construction activities at mining operations may be subject to requirements of the Stormwater and Erosion Control Ordinance. Contact the Department of Community Development at (360) 397-2375 for more information, or check the summary of regulatory requirements in Chapter 5.

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AS A-38: Well and Geotechnical Drilling

This activity applies to you if you drill water wells, environmental protection and monitoring wells, and geotechnical borings that use machinery in the drilling. It does not apply to the use of devices such as hand augers. Drilling activities have the potential to impact nearby surface water resources and underlying groundwater resources due to erosion sedimentation, and leaching of contaminants. Stormwater runoff that comes in contact with cuttings and/or spoil piles can carry suspended solids to receiving waters. If cuttings or spoil piles contain material removed from a well or boring that was drilled into contaminated subsoils, stormwater can carry those same contaminants into streams wetlands and lakes. Similarly, decontamination water and water used in the drilling operation can readily carry pollutants away from the drilling site if controls are not used. Ensure that proper permits are obtained for drilling activities, and for clearing and grading the access routes and the work site. Contact the Clark County Department of Community Development at (360) 397-2375 for information regarding land disturbing activities and Clark County Health Department for well-drilling permit information.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in mechanical drilling of wells and geotechnical drilling.

1. Determine if environmentally sensitive areas (streams, wetlands, erosion hazards, and landslide hazards) exist at or within the area of influence of the work site.
2. Develop and implement methods of mitigating potential impacts to surrounding areas. The driller must be equipped to quickly respond to unusual conditions that may arise.
3. Locate and prepare access roadways such that the amount of excavation and the potential for erosion is minimized. See the standards of the Clark County Stormwater and Erosion Control Ordinance (Regulation R-2 in Chapter 5) and information on vehicle access preparation and maintenance and erosion control measures in AS A-27.
4. Contain accumulated water and sediment on-site and direct through a geotextile filtration system (or other system) before discharging to the surrounding ground surface. If sediment-laden water does escape from the immediate drilling location, block any nearby catch basins using fabric sand bags, straw bales, or erosion fences. Similarly, block flow into any nearby stream or wetland, and renew efforts to retain all sediment at the drilling location.

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5. During wet weather, divert any concentrated flows of water into the site using sandbags or other such check dams up-slope from the site.
6. Dispose of soil cuttings and accumulated sediment by appropriate methods. None of this material can be dumped in or near a wetland, stream or lake. If cuttings or other soils disturbed in the drilling process are to be temporarily stockpiled on-site, they must be covered and surrounded by a berm or filter device.
 - ✓ *See the AS A-4 “Storage of Soil, Sand, Salt, and Other Erodible Materials.” for ideas.*
7. Stabilize exposed soils at the end of the job, using mulch or other erosion control measures.

AS A-39: Roof Vents and Fugitive Emissions

This activity applies if you have a process that vents emissions to the roof and/or if pollutants accumulate on your roof. Stormwater runoff from roofs of manufacturing and commercial buildings can be sources of pollutants if building vents and other air emission sources are not properly treated. Roof surfaces may accumulate hydrocarbons, solvents, and other organic compounds, oils and greases, metals, and other toxins and suspended solids. Operations that are of special concern include spray-paint booths, paint-stripping operations, electroplating shops, galvanizing operations, cement kiln dust, and grease from food preparation. BMPs for paint processes are given in this manual under “Painting, Finishing, and Coating of Vehicles, Products, and Equipment (A-22).”

Southwest Clean Air Agency and/or Ecology may regulate air pollution control measures. If your activities are regulated by either of these agencies, these requirements are supplemental. Additionally, if you are covered under an Ecology NPDES Industrial Permit, and sampling for specific parameters is required, these BMPs may assist you in attaining your permit conditions. Ecology has final approval on meeting your NPDES permit requirements.

Minimum Requirements

The following BMPs, or equivalent measures, methods or practices are required if you have vents and/or air emissions.

1. Identify processes that are vented and may contribute pollutants to the roof. Testing runoff from roof drains may be helpful. Install appropriate source control measures, such as air pollution control equipment (filters, scrubbers, and other treatment) and operational or process changes. Maintain air filters and pollution control equipment on a regular basis to prevent pollutant fallout on your roof. (If you smell odors from outside the building, the pollution control equipment may need maintenance or evaluation.)
2. If proper installation and maintenance of air pollution control equipment does not prevent pollutant fallout on your roof, additional treatment of the roof runoff may be necessary. Install/provide appropriate devices for roof runoff before it is discharged off site. This may include water quality treatment BMPs such as catch basin filters or structural stormwater treatment systems.

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- ✓ *See) BMP Information Sheet 8 in Chapter 5 for information on water quality treatment BMPs. Required Routine Maintenance:*
- If maintenance of the roof requires application of chemicals, detergents, or other pollutants sources to remove accumulated emissions, a water collection devise that enables collection of wash water and associated solids must be used to prevent pollutants entering the natural and constructed storm drainage system and waterways. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff must be discharged to the sanitary sewer or be removed by a waste disposal company.
- ✓ *See BMP Information Sheet 2 in Chapter 4 for information on disposal options.*

AS A-40: Street Deicing Operations

This activity applies to you if you perform deicing and/or anti-icing operations on streets and highways to control ice and snow. Deicers commonly used on highways and streets include sand, calcium magnesium acetate (CMA), calcium chloride, magnesium chloride, sodium chloride, urea, and potassium acetate. These 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 handling and storage.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you are performing deicing and/or anti-icing operations on streets and highways.

1. Select deicers and anti-icing materials that cause the least adverse environmental impact. Apply only as needed using minimum quantities. Always adhere to manufacturers and industry standards of use and application.
2. Where feasible and practicable, use roadway deicers, such as sand, calcium chloride, CMA, potassium acetate, or similar materials that cause less adverse environmental impact than urea, and sodium chloride.
3. Store and transfer deicing/anti-icing materials on an impervious containment area in a manner that ensures the material does not enter storm or natural drainage systems.
4. Sweep/clean up accumulated deicing/anti-icing materials and grit from roads as soon as possible after the road surface clears.
5. Minimize use in areas where runoff or spray from the roadway immediately enters sensitive areas, such as fish-bearing streams.

Additional BMPS

The following BMPs are optional unless the above minimum required BMPs do not provide adequate source control.

1. Intensify roadway cleaning in early spring to help remove particulates from road surfaces.
2. Include limits on toxic metals in the specifications for deicers/anti-icers.

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AS A-41: Wheel Wash and Tire Bath Operations

If a site is not paved (e.g., gravel or compacted dirt), sediment and mud on vehicle tires can be transported onto the adjacent paved roads. If track out cannot be controlled by constructing a typical rocked construction entrance, a wheel wash system may need to be installed. See BMP C106 in the Ecology Manual for a more detailed description of wheel wash operation requirements.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if a wheel wash or tire bath system is installed to control sediment tracking onto adjacent roads.

1. The wheel wash area must be paved.
2. The water level in the wheel wash should be a minimum of 12 inches deep.
3. Spray nozzles may be needed in muddy conditions.
4. Wheel wash systems should be designed with a small grade change, e.g., 6 to 12 inches for a 10-foot-wide ponding area, to allow sediment to collect in the low side of the ponding area to prevent re-suspension of solids.
5. **Required Routine Maintenance:**
 - A drain pipe with a 2 to 3 foot riser should be installed on the low side of the ponding area to allow for cleaning and refilling.
 - The wheel wash should start out with fresh water each day.

Alternative Designs

1. Closed loop wheel wash systems with the wastewater discharged to a sanitary sewer are preferred.
2. Polymers for flocculation may be used in closed loop systems that discharge to the sanitary sewer. Contact your local sewer district's Industrial Pretreatment Program for authorization.

✓ *See Appendix D of the Surface Water Design Manual for additional information on wheel wash systems.*

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AS A-42: Potable Water Line Flushing or Tank Maintenance

Line flushing and tank maintenance typically use chemicals, such as chlorine, to disinfect drinking water systems. These chemicals are highly toxic to aquatic organisms. Line flushing and tank maintenance also create suspended solids and metals that can degrade receiving waters.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you perform potable water line flushing or tank maintenance operations.

1. When flushing, filter water through sediment traps. If super chlorination is part of flushing, the water must be discharged to the sanitary sewer (with applicable permits) or if a sanitary sewer is not available, the water must be collected and disposed of appropriately. Water cannot be discharged directly to stormwater systems unless de-chlorinated to a concentration of 0.1 ppm or less, pH adjusted if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the storm sewer system. Discharging treated water to stormwater systems requires approval from Ecology. In some cases, flushing water can be infiltrated in well vegetated areas.
2. Tank cleaning water must go to the sanitary sewer or be infiltrated into the ground. No erosive flows can occur and water must not cross property lines. If tanks are simply drained, infiltration is an acceptable BMP.

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AS A-43: Mobile Fueling of Vehicles and Heavy Equipment

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 as a Class II Combustible Liquid, whereas gasoline is considered as a Flammable Liquid.

Historically mobile fueling has been conducted for off-road vehicles that are operated for extended period 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.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you perform mobile fueling of vehicles and heavy equipment.

1. Ensure that all mobile fueling operations are approved by the local fire department and comply with local and Washington State fire codes.
2. In fueling locations that are in close proximity to sensitive aquifers, designated wetlands, wetland buffers, or other waters of the State, approval by local jurisdictions is necessary to ensure compliance with additional local requirements.
3. Ensure the compliance with all 49 CFR 178 requirements for DOT 406 cargo tankers. Documentation from a Department of Transportation (DOT) Registered Inspector shall be proof of compliance.
4. Ensure the presence and the constant observation/monitoring of 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:
 - Locating the point of fueling at least 25 feet from the nearest storm drain or inside an impervious containment with a volumetric holding capacity equal to or greater than 110 percent of the fueling tank volume, or covering 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 local jurisdiction and the fire department need not be covered. Potential spill/leak conveyance surfaces must be impervious and in good repair.
 - Placement of 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 5 gallons. Spills retained in the drip pan or the pad need not be reported.
- The handling and operation of fuel transfer hoses and nozzle, drip pan(s), and absorbent pads as needed to prevent spills/leaks of fuel from reaching the ground, storm drains, and receiving waters.
 - Not extending the fueling hoses across a traffic lane without fluorescent traffic cones, or equivalent devices, conspicuously placed so that all traffic is blocked from crossing the fuel hose.
 - Removing the fill nozzle and cessation of filling when the automatic shut-off valve engages. Do not allow automatic shutoff fueling nozzles to be locked in the open position.
 - Not “topping off” the fuel receiving equipment.
5. Provide the driver/operator of the fueling vehicle with:
- Adequate flashlights or other mobile lighting to view fill openings with poor accessibility. Consult with local fire department for additional lighting requirements.
 - Two-way communication with his/her home base.
6. Train the driver/operator annually in spill prevention and cleanup measures and emergency procedures. Make all employees aware of the significant liability associated with fuel spills.
7. The fueling operating procedures should 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.
8. Ensure that the local fire department (911) and the appropriate regional office of the Department of Ecology are immediately notified in the event of any spill entering the surface or ground waters. Establish a “call down list” to ensure the rapid and proper notification of management and government officials should any significant amount of product be lost off-site. Keep the list in a protected but readily accessible location in the mobile fueling truck. The “call down list” should also pre-identify spill response contractors available in the area to ensure the rapid removal of significant product spillage into the environment.
9. Maintain a minimum of the following spill clean-up materials in all fueling vehicles, that are readily available for use:
- Non-water absorbents capable of absorbing 15 gallons of diesel fuel;

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- 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.
10. Use automatic shutoff nozzles for dispensing the fuel. Replace automatic shut-off nozzles as recommended by the manufacturer.
11. Maintain and replace equipment on fueling vehicles, particularly hoses and nozzles, at established intervals to prevent failures.

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AS A-44: Airport Anti-Icing and Deicing

Deicing and/or anti-icing compounds are used on airport runways and on aircraft to control ice and snow. Typically ethylene glycol and propylene glycol are deicers used on aircraft. 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.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you perform airport or aircraft anti-icing or deicing.

1. For aircraft, conduct aircraft deicing or anti-icing applications in impervious containment areas. Collect aircraft deicer or anti-icer spent chemicals, such as glycol, draining from aircraft in deicing or anti-icing application areas and convey to a sanitary sewer, treatment, or other approved disposal or recovery method. Divert deicing runoff from paved gate areas to appropriate collection areas or conveyances for proper treatment or disposal.
2. For aircraft, do not allow spent deicer or anti-icer chemicals or stormwater contaminated with aircraft deicer or anti-icer chemicals to be discharged from application areas including gate areas, to surface water, or ground water, directly or indirectly.
3. For aircraft, transfer deicing and anti-icing chemicals on an impervious containment pad, or equivalent spill/leak containment area, and store in secondary containment areas. (See AS A-2, Storage of Liquid Materials in Stationary Tanks.)
4. For airport runways/taxiways, avoid excessive application of all de/anti-icing chemicals, which could contaminate stormwater.

For airport runways/taxiways, store and transfer de/anti-icing materials on an impervious containment pad or an equivalent containment area and/or under cover in accordance with AS A-4 “Storage of Soil, Sand, Salt and Other Erodible Materials.” Other material storage and transfer approaches may be considered if it can be demonstrated that stormwater will not be contaminated with or the de/anti-icer material cannot reach surface or ground waters.

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AS A-45: Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots

Dust can cause air and water pollution problems particularly at demolition sites and in arid areas where reduced rainfall exposes soil particles to transport by air. Minimize dust generation and apply environmentally friendly and government approved dust suppressant chemicals, if necessary.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you control dust at disturbed land areas and unpaved roadways and parking lots.

1. Sprinkle or wet down soil or dust with water as long as it does not result in a wastewater discharge.
2. 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."
3. 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.
4. Apply stormwater containment to prevent the conveyance of stormwater TSS into storm drains or receiving waters.
5. The use of motor oil for dust control is prohibited. Care should be taken when using lignin derivatives and other high BOD chemicals in excavations or areas easily accessible to surface water or ground water.
6. Consult with the Ecology Southwest Regional Office on discharge permit requirements if the dust suppression process results in a wastewater discharge to the ground, ground water, storm drain, or surface water.

Additional BMPS

The following BMPs are not required but they can provide improved pollution control.

For roadways and other trafficked areas:

1. Consider limiting use of off-road recreational vehicles on dust generating land.

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2. Consider paving unpaved permanent roads and other trafficked areas at municipal, commercial, and industrial areas.
3. Consider paving or stabilizing shoulders of paved roads with gravel, vegetation, or local government approved chemicals.
4. Encourage use of alternate paved routes, if available.
5. Vacuum or wet sweep fine dirt and skid control materials from paved roads soon after winter weather ends or when needed.
6. Consider using traction sand that is pre-washed to reduce dust emissions.

For dust generating areas:

1. Prepare a dust control plan.
2. Limit exposure of soil (dust source) as much as feasible.
3. Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
4. Apply windbreaks in the soil such as trees, board fences, tarp curtains, bales of hay, etc.
5. Cover dust-generating piles with wind-impervious fabric, or equivalent material.

AS A-46: Log Sorting and Handling

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.

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

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices are required if you are engaged in log sorting and handling.

1. Industries with log yards are required by the state 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.

CHAPTER 3.
STORMWATER BEST MANAGEMENT PRACTICES
FOR SPECIFIC ACTIVITIES

AS A-47: Manufacturing Activities - Outside

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.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you engage in manufacturing activities outside.

1. Sweep paved areas regularly, as needed, to prevent contamination of stormwater.
2. Alter the activity by eliminating or minimizing the contamination of stormwater.
3. If possible, enclose the manufacturing activity in a building.

✓ *See BMP Information sheet 2 in Chapter 4 for information on disposal options.*

4. Cover the activity and connect floor drains to a sanitary sewer, if approved by the local sewer authority. Berm or slope the floor as needed to prevent drainage of pollutants to outside areas.
5. Isolate and segregate pollutants as feasible. Convey the segregated pollutants to a sanitary sewer, process treatment or a dead-end sump depending on available methods and applicable permit requirements.

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AS A-48: Dust Control at Manufacturing Areas

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 products mixing, 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. Prevent dust generation and emissions where feasible, regularly clean-up dust that can contaminate stormwater, and convey dust contaminated stormwater to proper treatment.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you engage in manufacturing activities that create dust.

1. Clean, as needed, powder material handling equipment and vehicles that can be sources of stormwater pollutants, to remove accumulated dust and residue.
2. Regularly sweep dust accumulation areas that can contaminate stormwater. Sweeping should be conducted using vacuum filter equipment to minimize dust generation and to ensure optimal dust removal.

Additional BMPS

The following BMPs are not required but they can provide improved pollution control.

1. In manufacturing operations, train employees to carefully handle powders to prevent generation of dust.
2. Use dust filtration/collection systems such as bag house filters, cyclone separators, etc. to control vented dust emissions that could contaminate stormwater. Control of zinc dusts in rubber production is one example.
3. Use water spray to flush dust accumulations to sanitary sewers where allowed by the local sewer authority or to other appropriate treatment system.
4. Use approved dust suppressants such as those listed in Ecology Publication "Techniques for Dust Prevention and Suppression," #96-433 (Ecology, 1996). Application of some products may not be appropriate in close proximity to receiving waters or conveyance close to receiving waters. For more information check with the Ecology Southwest Regional Office.

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STORMWATER BEST MANAGEMENT PRACTICES
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AS A-49: Soil Erosion and Sediment Control at Industrial Sites

Industrial activities on soil areas; exposed and disturbed soils; steep grading; etc. can be sources of sediments that can contaminate stormwater runoff. Limit the exposure of erodible soil, stabilize or cover erodible soil where necessary to prevent erosion, and/or provide treatment for stormwater contaminated with TSS caused by eroded soil.

Minimum Requirements

The following BMPs, or equivalent measures, methods, or practices, are required if you engage in industrial activities on soil or that disturbs soils.

1. Plant vegetative cover such as grass, trees, or shrubs on erodible soil areas

OR

Cover erodible soil areas with mats such as clear plastic, jute synthetic fiber

AND / OR

Preserve natural vegetation including grass, trees, shrubs, and vines

2. Install a vegetative swale, dike, silt fence, check dam, gravel filter berm, sedimentation basin, and proper grading. For design information refer to Stormwater Management Manual for Western Washington, Volume II, “Standards and Specifications for BMPs” (Ecology, 2005).

CHAPTER 3.
STORMWATER BEST MANAGEMENT PRACTICES
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CHAPTER 4. BMP INFORMATION SHEETS

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Best Management Practices Information Sheets

This chapter provides information on how to implement several best management practices discussed in Chapter 3. It also provides information on typical water quality treatment facilities.

Table 4.1 below lists the BMPs that are discussed in this chapter. The BMP Information Sheets are divided into two sections: Source Control and Water Quality Treatment. The Source Control section includes BMP Information Sheets 1-7. The Water Quality Treatment Section includes BMP Information Sheets 8-15.

TABLE 4.1 BMP INFORMATION SHEETS

BMP #	Best Management Practice
1	Illicit Connections
2	Disposal Options
3	Covering Options
4	Pave Area and Slope to Holding Tank
5	Containment and Elevation
6	Integrated Pest Management
7	Catch Basin Cleaning
8	Oil/Water Separator
9	Catch Basin Insert
10	Catch Basin Sump and Vault Filter
11	Leaf Compost Filter
12	Wet Pond, Wet Vault or Construct Wetland
13	Vegetated Biofilters
14	Sand Filter
15	Infiltration

See Chapter 5 - Other Agency Requirements and Chapter 6 - Technical and Financial Assistance for other useful information to assist you in implementing the BMPs on your site.

Source-Control BMPs: Information Sheets 1-7

The following BMP Information Sheets discuss a variety of source-control BMPs and other methods used to prevent, control, and dispose of pollutants. Source-control BMPs prevent pollutants from mixing with and contaminating stormwater runoff or entering water bodies. Some source-control BMPs are operational, such as reducing the frequency of a polluting activity, checking regularly for leaks and drips, and educating employees about site cleanup procedures. Other source-control BMPs use a structure to prevent rainwater from contacting materials that will contaminate stormwater runoff. Examples of these BMPs include a berm or containment structure to prevent clean stormwater from entering work areas, or a roof over a storage area. A source control BMP can also include altering or revising your industrial process to use less of a contaminating substance in the first place.

The goal of Clark County's program is to reduce the contamination of water resources through emphasis on source-control BMPs. The following BMP Information Sheets provide more detail information on how to implement some of these source-control BMPs.

BMP Information Sheet 1: Illicit Connections

An illicit connection is a connection that could convey anything not composed entirely of surface and stormwater directly to the storm drainage system or a water body. These typically include, but are not limited to, sanitary sewer pipes, process wastewater discharges, sump overflows, and internal building drains connected to the storm drainage system. As a result of illicit connections, wastewater containing a variety of pollutants is discharged directly to storm sewers and drainage ditches, and ultimately to receiving waters rather than to the sanitary sewer system or septic system. In many instances, these connections are unknown to the business and may not even show up on building drawings. Elimination of illicit storm drainage connections is an important facet of a stormwater pollution reduction program and must be addressed as a top priority. Clark County is committed to determining where illicit connections are present and to requiring their removal.

Finding an Illicit Connection

All businesses and public agencies in unincorporated Clark County must investigate their plumbing systems to determine if there are any illicit connections to the storm drainage system, such as internal floor drains plumbed to the storm drainage system. If building and property drawings are available with plumbing details, they should be reviewed to understand pipe connections.

If you are unsure whether a particular drain (such as a floor drain) discharges to the storm drainage system, you have two choices. The first is to assume it does and permanently plug the drain or connection. This would be the easiest and most cost effective solution. The second is to correctly identify where the connection drains by consulting plans, sewer agency records, and possibly conducting a dye test. This option can be time consuming and costly.

Any pipes or other conveyances connected to storm drainage facilities that drain anything but stormwater must be permanently plugged or rerouted to a sanitary sewer, holding tank, on-site process treatment system, or septic system (with approval).

If building plans and sewer agency records do not show your plumbing, the most basic method for determining a connection is dye tracing. A nontoxic dye of obvious color, such as red, can be put in water and flushed or drained into suspect piping. Observations should then be made in manholes, drainage ditches, or whatever other storm drainage conveyances are present on site (or adjacent to the property) to search for the dye. Enough water must be poured or flushed through the indoor drain to force the flow to reach the point(s) of observation. If possible, all other drains in the building should be out of use while the dye test is conducted to ensure the results can pinpoint the problem drain. This test should be conducted for each suspect drain on the property. Any observations of dye in the storm drainage system must be noted and the corresponding indoor drains tagged for follow-up pipe plugging or rerouting.

If there is uncertainty as to the locations of manholes which can be used for observation or how storm drainage is achieved for a property, Clark County staff should be contacted for assistance in defining the storm drainage system characteristics for the site. The County must be notified of a dye test at least one day in advance of testing by calling the Clean Water Program at (360) 397-6118, ext. 4392.

Eliminating an Illicit Connection

Drains and pipes which are found to connect to the storm drainage system must either be permanently plugged or disconnected and rerouted as soon as possible. Drains that are no longer needed can be plugged with concrete or similarly effective materials. Whenever the diversion of any process water, stormwater, or other wastewater to the sanitary sewer is the required or chosen BMP, the local sewer authority must be contacted to obtain approval prior to commencement of discharges to the sanitary sewer. The local sewer authority must also be contacted prior to the installation of any permanent connection to the sanitary sewer. The name of your local sewer agency is identified on your water and sewer billing. The local sewer agency will explain any regulatory requirements, but the responsible party will have to arrange for the necessary plumbing supplies and pipe disconnection/rerouting work.

If the property is not serviced by a sanitary sewer, and one is not available nearby for a hookup, alternative measures are necessary. If the discharge is domestic wastewater from a toilet, sink, appliance, or shower/bathtub, a septic system can be used to receive the rerouted discharge. The connection of plumbing fixtures to an on-site sewage disposal system usually requires an on-site sewage disposal system repair permit. Therefore, before pipes are rerouted, you must contact the Clark County Public Health Department at (360) 397-8428 for further information. If a septic system is not present on the property, then one should be installed. If this is the case, the Clark County Public Health Department should be contacted for advice and information on septic system requirements.

If the discharge is industrial process water or other nondomestic wastewater, a holding tank or on-site treatment system will be needed. If an illicit connection needs to be rerouted to a holding tank, County staff can provide assistance and information on tank content disposal requirements. As with septic system and sanitary sewer hookups, the property owner or responsible business operator is responsible for rerouting the illicit pipe connections.

End of BMP Information Sheet #1

BMP Information Sheet 2: Disposal Options

Every business and public agency in Clark County must dispose of solid and liquid wastes and contaminated stormwater properly. There are generally five options for disposal depending on the types and quantity of materials. These options are: 1) sanitary sewer system, 2) septic system, 3) recycling, 4) municipal solid waste disposal facilities, and 5) waste transportation and disposal services. Ordinary stormwater runoff is not considered to be contaminated to the point of requiring special disposal. Stormwater that is mixed with concentrated wastes requires special disposal, as discussed below.

Discharge to Sanitary Sewer System

Stormwater is prohibited from being discharged to the sanitary sewer: however, local sewer agencies may authorize the discharge of contaminated stormwater from certain types of industrial activities under certain circumstances. Process wastewater (depending on the pollutants and associated concentrations present) can be put into the sanitary sewer, subject to approval by the local sewer agency. Animal waste can be disposed of in a sanitary sewer, subject to loading capacity constraints. If a sewer agency allows stormwater discharges to a sanitary sewer be metered, sewer fees may be collected on such discharges.

The first priority is to discharge process water to a sanitary sewer via an existing plumbing connection or a new pipe connection. Whenever the diversion of any process water or other wastewater to the sanitary sewer is the required or chosen BMP, the local sewer authority must be contacted to obtain approval before the discharges to the sanitary sewer begins. Pretreatment of discharges to remove some of the process water pollutants may be required as a condition of discharging to the sanitary sewer. The local sewer authority must also be contacted prior to the installation of any permanent connection to the sanitary sewer. The name of your local sewer authority is identified on your water and sewer billing. See Chapter 5 for more information on sanitary sewer authority requirements.

If you can not discharge to a sanitary sewer system, then sumps or other temporary storage devices may be useful for storing liquid wastes on a temporary basis. Consideration should be given to using a holding tank for used process water if the volume of process water generated by the activity is not excessive. See BMP Information Sheet 4 for more information on holding tanks. The contents of the holding tank must be pumped out or drained before the tank is full. Several commercial services are available for pumping out sumps and holding tanks. These can be found in your telephone directory's yellow pages under the headings "Sewer Contractors" and "Tanks - Cleaning." Septic system pump-out and hauling contractors must not be used for disposing wastes other than domestic sewage. They are not allowed to haul industrial wastes.

Discharge to Septic System

If your site is not serviced by a sanitary sewer system, you probably have a septic system. Only liquid waste that is comparable to residential sewage in strength and content may be disposed of in septic systems. Hazardous chemicals cannot be disposed of in septic systems. Further, the septic system must be designed to accommodate the volume of suitable wastewater generated. Any changes in waste volume and content from those present when the system was permitted must be approved by the Clark County Public Health Department. Stormwater, whether contaminated or not, may not be disposed of in septic systems. Animal waste may not be disposed in a septic system.

Recycling

Recycling facilities are a recommended option for many commercial items, including used oils, used batteries, old equipment, a variety of used auto parts, metal scrap materials, solvents, paints, and various other solid wastes. In addition to drop offs at solid waste transfer stations, there are a number of private businesses that purchase or accept materials for recycling. In addition, there is a regional Industrial Material Exchange clearinghouse that facilitates the transfer of unwanted materials from the generator to another business that can use them. Contact the Clark County Solid Waste Program at (360) 397-6118, ext. 4352 for information.

Process wastewater, such as wash water, can be recycled on site as an alternative to discharge to sanitary sewer. There are numerous products on the market to recycle wash water.

See Chapter 6 for more information.

Municipal Solid Waste Disposal Facilities

Municipal solid waste disposal facilities are designed to handle solid wastes. Hazardous and dangerous wastes and many liquid wastes must be properly disposed of at an appropriate facility. Contact your local transfer station for information on materials accepted at the facilities. The Clark County Solid Waste Program at (360) 397-6118, ext. 4016 can provide information on disposal of oil, antifreeze, and other hazardous wastes.

Waste Transportation and Disposal

There are numerous services that can help you identify, quantify, transport, and dispose of waste that you may generate. Many people have their wastes picked up by a disposal contractor.

The disposal of wastes is the responsibility of the generator. Before agreeing to let a company handle your waste, it is recommended that you ask for (and check) the company's references. All waste collected by the company should be delivered to an authorized site. Make sure you keep copies of all your transactions.

Disposal costs vary considerably depending on the types of materials, quantities, methods of collection and transport, and whether the wastes are mixed. The rate the contractor charges will generally reflect the costs of testing and/or treating waste materials (if necessary) and subsequent disposal. It is important to keep different types of wastes separated, so that the disposal contractor(s) can take them to the appropriate place(s) without causing inadvertent contamination problems elsewhere, and so that you are not paying too much for disposal of materials that are not contaminated (e.g. regular garbage). If you are doing a good job with BMPs and collect contaminated waste materials for proper disposal, your efforts are compromised if a disposal contractor subsequently disposes the contaminated materials as regular garbage. Therefore, it is essential to be familiar with disposal alternatives and the different types of contractors for each disposal option.

Call the Clark County Solid Waste Program at (360) 397-6118, ext. 4352 for more information.

End of BMP Information Sheet #2

BMP Information Sheet 3: Covering Options: Tarp, Roof, or Awning

One of the most effective actions a person can take to prevent stormwater contamination is keeping potential pollutants out of the rain. There are numerous options for covering an activity. This BMP, combined with prevention of stormwater run-on into the covered area, can be as effective as indoor enclosure.

The simplest cover is the use of tarps or other nonstructural covers. Any building of structures requires a building permit and must comply with applicable building and fire codes. These building requirements may, in some cases, make some of these structures too expensive to be practical. Contact the Clark County Community Development Department for information on building permits and requirements for a roof structure.

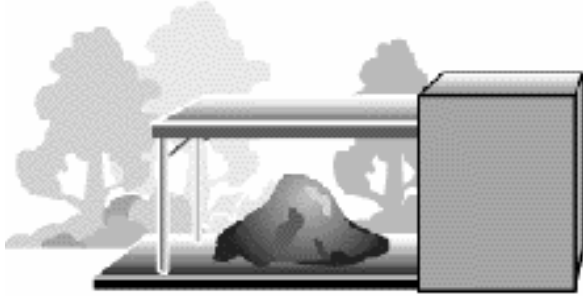
Many activities, such as stockpiling of raw materials or storage of drums, can be effectively covered with a heavy plastic tarp made of impermeable material. Weights such as bricks, tires, or sandbags should be used to anchor the cover in place. Care should be taken to ensure that the tarp covers the activity completely and that stormwater run-on does not penetrate significantly under the cover. If several tarps are used to form a cover, they should be tethered together or laid in an overlapping manner. If necessary, pins or stakes should be used to anchor the tarps to the ground. The tarp covering will be easier to keep in place and will last longer if some form of wind protection is possible. Attempts should be made to locate stockpiles in areas where winds are minimal.



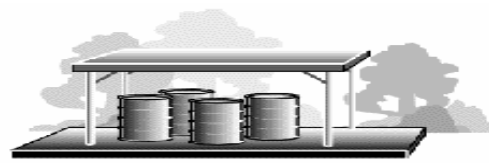
Tarp Covering

The tarps must be in place when the material is not being used. The tarps must be inspected weekly to ensure that no holes or gaps are present. Tarps are inexpensive and, therefore, are a cost-effective BMP for many activities. This BMP can be combined with containment for better effectiveness. See BMP Information Sheet 5 for more information.

The other option for covering is the use of a roof structure. The particular roof cover option used at a given site is subject to the site layout, available space, affordability, and limitations imposed by other regulations. The area of the roof cover should be sufficient to prevent any precipitation from reaching the protected contents underneath. This BMP should usually be implemented in conjunction with prevention of stormwater run-on into the covered area. BMP Information Sheet 5 presents information on containment/run-on prevention. Examples of various structures are shown below.



Lean-To-Structure

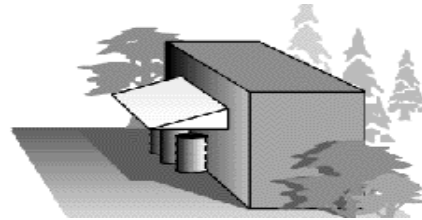


Stand-Alone Canopy

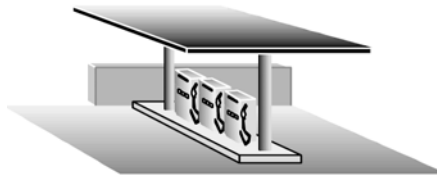
There are also numerous prefabricated storage sheds that can be purchased to enclose and cover materials. This may be a preferred alternative on some sites. Again, before purchasing these structures ensure they meet applicable building and fire codes.

Another option for covering an activity is to use an overhanging awning of sufficient size to prevent precipitation from reaching the contents underneath. This cannot be an awning already in place over a public right-of-way such as a sidewalk in front of a store. Many of the building permit, fire code, and zoning code requirements mentioned above apply to these structures also.

Activities such as fueling operations maybe conveniently covered by an island-type overhanging roof. This roof arrangement is supported by columns along the center of the structure rather than at the corners, enabling vehicular traffic underneath while still providing sufficient protection from precipitation.



Overhanging Awning



Island-Type Overhanging Roof

End of BMP Information Sheet #3

BMP Information Sheet 4: Pave Area and Slope to Holding Tank

This BMP applies to several activities that cannot be covered effectively and, therefore, require a method of controlling off-site runoff that may be contaminated. It is particularly suited to activities with the potential for spills and leaks, but otherwise do not generate excessive amounts of polluted runoff. In addition, this BMP is well suited to activities that intermittently produce wastewater such as washing operations. A sump or holding tank serves to provide spill containment until the liquids can be pumped out and properly disposed. If the activity produces large amounts of runoff, this BMP will not be very effective because the stray contaminants will overflow the sump or pass through the sump before collection and disposal are possible. The following implementation information is intended for situations where this BMP can be effective.

A designated activity area should be paved and sloped to drain to a central collection point. A sump, vault, or holding tank should be installed underneath this collection drain. Some materials, such as gasoline, can react with asphalt pavement and cause the release of toxic oils from the pavement. It is preferable for the area to be paved with portland cement concrete. If the area is already paved with asphalt, an asphalt sealant should be applied to the pavement surface. Whichever paving material is used, the paved surface must be free of gaps and cracks.

The sump or holding tank should have a large enough capacity to contain the entire volume of wastewater generated by the activity, or the entire volume of a potential spill (whichever is applicable, or the greater of the two). Depending on the circumstances, the sump or tank can be equipped with an outflow pipe to allow discharge of normal, uncontaminated runoff to the storm drainage system. While it is unlikely, the local sewer authority may allow a connection of sump outflow to the sanitary sewer system.

The paved activity area must also be contained to prevent stormwater run-on and runoff. This can be a curb, dike, or berm or similarly effective impediment to run-on, or intercepting storm drains (see BMP Information Sheet 5 in this chapter for more information). This way only the precipitation that falls within the activity area is discharged and/or treated along with the activity process water.

The drain pipe can have a two-way valve in it so that uncontaminated runoff from the activity area can discharge to the storm drainage system at times when the activity is not occurring. The two-way valve can therefore switch between discharges to the sanitary sewer, holding tank, or treatment facility, and discharges to the storm drainage system. Each time the activity is occurring, the two-way valve must be switched so that the site runoff discharges to the sanitary sewer, holding tank, or treatment facility. After the activity operations are finished and no more process water is generated, the area must be sprayed, hosed, or otherwise washed down with the runoff going to the sanitary sewer, holding tank, or treatment facility. The two-way valve must be switched after site drainage is complete so that subsequent runoff is discharged to the storm drainage system until the next time the activity occurs. It is critical that careful attention be given to this valve so that it is always switched to the correct position. Approval for discharges with a two-way valve should be obtained from the local sewer authority.

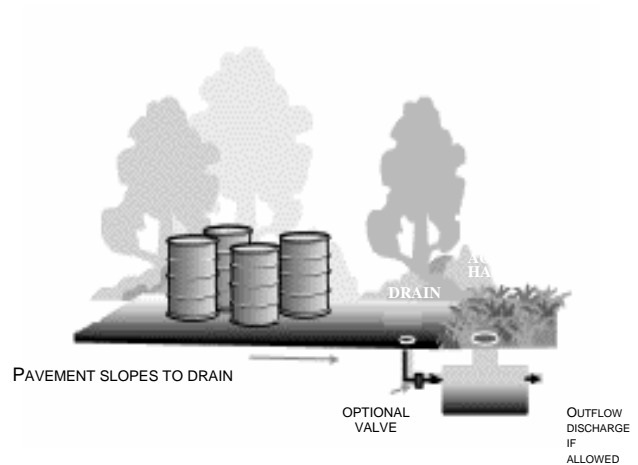
If discharges to the storm drainage system or sanitary sewer are not allowed, the sump or holding tank contents will need to be pumped out periodically and disposed of properly. This requirement can make this BMP costly, especially during the wet season. See BMP Information Sheet 2 for disposal options.

An example of a paved activity area with a sump drain is shown to the right.

Drainage into the sump or holding tank should only occur at times when the activity is occurring. To keep disposal costs down, a drain cover, plug, or shutoff valve in the pipe leading to the sump should be used at times when the activity is not occurring. Before starting the activity (if the activity is intermittent), the cover, plug, or valve must be opened.

The cost of constructing a sump and disposing of accumulated contents can be high, so businesses should consider whether other allowable BMP alternatives can be used. Additional fees are charged by individual cities if a sanitary sewer hookup is made. The fees depend on location, quantity of discharge, and whether the hookup is for a business or residence. A state waste discharge permit may also be required in some situations.

Several commercial services are available for pumping out sumps and holding tanks. These can be found in your telephone directory's yellow pages under the headings "Sewer Contractors" and "Tanks – Cleaning." Septic system pump-out and hauling contractors must not be used for disposing wastes other than domestic sewage. They are not allowed to haul industrial wastes.



Paved Area with Sump Drain

End of BMP Information Sheet #4

BMP Information Sheet 5: Containment and Elevation: Surround with Dike or Berm, or Elevate

This set of BMP options can be an effective means for prevention of stormwater run-on to a contaminated activity area and for containment of spills in the activity area. This BMP may be less expensive to implement than paving the activity area and providing proper drainage collection, but can also be more difficult to maintain if stormwater ponding occurs inside a containment dike.

If a curb, berm, or dike is used to prevent stormwater run-on to a covered activity area, and the activity area is paved or otherwise impermeable, it should be placed underneath the covering so that precipitation will not pond inside it. In some instances, run-on prevention can be accomplished by placing containment materials on up-slope sides of the activity area. Stormwater run-on can also be prevented by elevating the activity with a platform or other type of pedestal.

Containment may be achieved with concrete curbing, an earthen berm, a tub such as a plastic wading pool, or some other dike material, depending on the activity, its size, and resources available. If a curb, berm, or dike is used to contain possible spills, and other containment sizing regulations (such as fire codes or Ecology requirements) do not apply, it should be sized to hold a volume of 110 percent of the volume contained in the tank/containers.

Containment without a cover means water will accumulate in the area during and after rain. Any contaminated water cannot simply be drained from the area; it must be collected and disposed of either in a sanitary sewer, a stormwater treatment system, or at a licensed disposal facility. During the wet season, this course of action can lead to frequent draining requirements that may prove costly. In addition, some type of monitoring may be needed to determine if the water is contaminated. If the stormwater is typically clean, or if a stormwater treatment system is present on site, a valve should be installed in the containment dike so that excess stormwater can be drained out of the activity area and directed either to storm drainage facilities (if clean) or into the stormwater treatment system (if contaminated), whichever applies. This valve should always be kept closed unless excess stormwater is being discharged, so that any spills that occur within the activity area can be effectively contained. Local sewer authorities will probably not allow discharges from a large containment area into the sewer system. Therefore, containment in conjunction with a sanitary sewer hookup is usually not applicable to large sites.

If containment is used rather than covering for stockpiles of material, a dike, berm, or filter must be placed on at least three sides of every stockpile to act as a barrier or filter to runoff. If the containment device is three-sided, the open side should be neither on the upslope or downslope side of the stockpile, if feasible. The dike or filter can be made of hay bales, silt fencing (filter fabric), concrete curbing, ecology blocks, compacted earth with grass planted on it, or similarly effective materials. Timbers treated with creosote or other preservatives should not be used because they can leach contaminants into runoff. If undesired ponding will occur due to a sturdy dike, filter materials should be used instead. All filter materials used around stockpiles must be maintained to work effectively and must be replaced when necessary.



Simple Containment Devices

For storage of liquids in permanent above-ground tanks, install secondary containment or a double-walled tank. Slope the containment area to a drain with a sump. Stormwater collected in the containment area may need to be discharged to treatment such as an API or CP oil/water separator, or equivalent BMP. Add safeguards against accidental releases including protective guards around tanks to protect against vehicle or forklift damage, and tagging valves to reduce human error. Tank water and condensate discharges are process wastewater that may need an NPDES Permit.

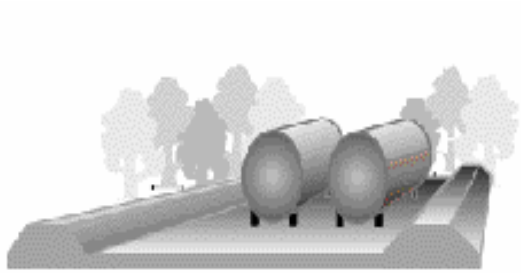
- Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes

or UL Approved double-walled. The dike must be of sufficient height to provide a containment volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank, whichever is greater, or, if a single tank, 110 percent of the volume of that tank.

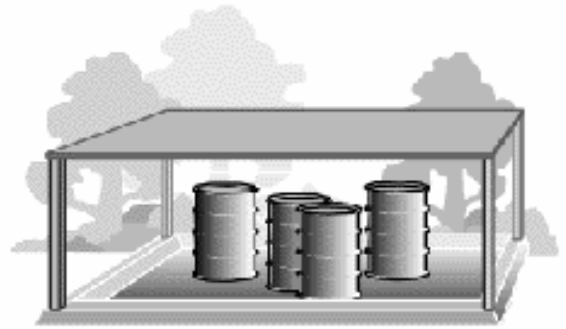
- Slope the secondary containment to drain to a dead-end sump (optional), or equivalent, for the collection of small spills.
- Include a tank overfill protection system to minimize the risk of spillage during loading.

For storage of small items, the simplest containment device is a tub or wading pool. A rubber or plastic children's wading pool may be sufficient for some activities that do not require a lot of space, such as storing remodeling and painting materials, and temporary storage of wastes in drums. These small storage devices should also be covered with a tarp or other cover. An example of this is shown above.

It should also be noted, with caution, that neglect and poor maintenance can render the containment useless. Maintenance of containment devices has to be stressed as essential for them to work as intended. Commercial products are available that are a combination containment box/elevated pedestal. These devices prevent stormwater run-on by elevating containers of liquids (such as drums) off the ground and collecting spills and drips inside the pedestal box.



Containment Dike



Containment Curb

End of BMP Information Sheet #5

BMP Information Sheet 6: Integrated Pest Management

Use of herbicides, insecticides, fungicides, and rodenticides can be extremely harmful to the environment because of the highly toxic nature of many chemicals in pesticide products. In light of this, special attention should be given to pesticide usage in all applications. The discussion below applies more to large-scale pesticide users, but should be considered for backyard applications as well.

Commercial, agricultural, 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(s) to use, the timing and extent of chemical application, and whether nonchemical means can attain an acceptable level of pest control.

IPM is a preventive measure aimed at knowing the exact pest(s) 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, and 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 a guiding rule.

Contact the Clark County Clean Water Program at (360) 397-6118, ext. 4392 for more information.

End of BMP Information Sheet #6

BMP Information Sheet 7: Catch Basin Cleaning

Many commercial, industrial, and public agency properties have underground storm sewer drainage systems with catch basins as key components. Catch basins are typically located along curbs, under low spots in parking lots, and where sewer pipes combine flows. Storm drains that are visible on the surface collect runoff for catch basins that are typically located directly underneath them. Most catch basins have a few feet of storage in the bottom that never drains to an outflow pipe. This permanent storage area is intended to trap sediments, debris, and other particles that can settle out of stormwater, to prevent clogging of downstream pipes and washing of these solids into receiving waters. Many catch basins have down-turned elbows at the outlet. These elbows are intended to trap floating debris and oil.

Anyone who has ever looked into a catch basin can attest to its ability to capture dirt, leaves, twigs, litter, and a variety of other materials that make for a mucky buildup in the bottom. However, if the sump in the bottom is full of solid material, everything in the incoming runoff passes straight through to an outflow pipe. The bottom (or sump) in catch basins must be cleaned out periodically so they can continue to trap solids in runoff. Routine maintenance practices at all sites with storm drains and catch basins must include cleaning of these important drainage system features. If catch basins are not cleaned, they can actually contribute to receiving water pollution problems when trapped solids and polluted water in sumps are flushed out during turbulent storm flow conditions.

Check your catch basins regularly for needed maintenance (at minimum once per season). It is especially important to check and clean catch basins after extended dry periods. As a rule of thumb, catch basins must be cleaned out when the solids, trash and debris in the sump at the bottom reaches one-third of the depth between the bottom of the sump and the bottom (invert) of the lowest inflow or outflow pipe connected to the catch basin. This is the level at which flushing of pollutants can be a problem. The rate at which a sump fills with solid material is quite variable and depends on the characteristics of the area draining into it. If activities that generate a lot of sediments are taking place, such as stripping soils bare, stockpiling erodible raw materials, and washing of vehicles and other equipment, the sump will obviously fill up relatively quickly. Therefore, catch basins at sites that generate a lot of sediment and other debris will have to be cleaned out more often.

If you clean the catch basin yourself, you may dispose of up to one cubic yard of catch basin material as solid waste in your regular garbage. If you exceed this threshold you are encouraged to contact a company offering catch basin cleaning services. You can locate a cleaning service in your telephone directory's yellow pages under headings like "Sewer Contractors and Cleaning," "Tanks – Cleaning," and "Environmental and Ecological Services." All of the solids and stagnant water collected from catch basin sumps must be disposed of properly.

None of the sump contents can be flushed into the catch basin outflow pipe. Depending on the nature of the pollutants in the sump and the associated types of activities taking place on the site, the sump contents may need to be disposed of as hazardous waste. Contractors who perform catch basin clean-out services are required to follow appropriate disposal requirements.

Frequent sweeping of activity areas, covering activity areas, reducing activity occurrence, and containing runoff from activity areas will help reduce catch basin cleaning frequency, and probably save time and money spent on catch basin cleaning. All businesses and public agencies should set up maintenance schedules for all of their BMPs so that coordinated BMP maintenance efforts result in reduced catch basin cleaning necessity.

End of BMP Sheet # 7

Water Quality Treatment BMPs: BMP Information Sheets 8-15

While the source-control BMPs are aimed at keeping pollutants out of stormwater, once contaminants enter stormwater, water quality treatment BMPs are used to remove them. The following BMP Information Sheets discuss a variety of water quality treatment facilities. Treatment BMPs are usually complex structures that treat the stormwater to remove contaminants. Most treatment facilities require careful planning, design, and construction and no facility is capable of removing 100 percent of the contaminants in stormwater. Because of this, source-control BMPs, as presented in Chapter 3, should always be considered first.

The BMP Information Sheets describe the water quality treatment facilities, including the applicability, maintenance, and design considerations of each. Design and construction details are referred to the Stormwater Management Manual for Western Washington or other manual later adopted by Clark County, or to a private vendor specializing in the treatment system.

Table 4.2 (next page) presents a brief description of each water quality treatment BMP discussed in the Information sheets. Table 4.3 presents the appropriate water quality treatment BMPs for removing specified pollutants. One treatment BMP usually cannot treat all pollutant problems. Each BMP is best suited for removing certain pollutants. If you decide to install a water quality treatment BMP, be sure that it is the right one for the pollutant of concern at your site.

TABLE 4.2 WATER QUALITY TREATMENT BMPs

TREATMENT BMP	BRIEF DESCRIPTION
Oil/Water Separator	An underground vault specifically designed to remove oil and grease. Also will remove floating and some settleable pollutants. Most are not specifically designed to treat stormwater.
Catch Basin Insert	A filtering device that is installed within a catch basin and uses various absorbent materials and settling space to collect pollutants.
Catch Basin Sump and Vault Filter	A device similar to catch basin inserts, only larger and placed underground.
Leaf Compost Filters	A patented filtering device that is installed above or below ground and uses pellets made from leaf compost to remove pollutants from stormwater.
Other Patented Treatment Systems	Patented subsurface treatment systems designed to separate sediment and oils from stormwater are available from several vendors. At this time, these systems are not widely used in Clark County.
Wet Pond, Constructed Wetland, Wet Vault	A wet pond is a stormwater pond that retains a permanent pool of water. A constructed wetland is similar to a wet pond, but shallower and supporting wetland vegetation in large areas. A wet vault is an underground, covered, structure that retains a permanent pool of water.
Vegetated Biofilters: Biofiltration Swale and Filter Strip	A biofiltration swale is a long, gently sloped ditch or depression designed to treat water as it passes through the vegetation. Grass is the most common vegetation. A filter strip is a grass area, wider than biofilters, also with gentle slopes. Water usually enters as a thin sheet flow from the adjoining pavement.
Sand Filter	These are structures placed in the open in the landscape open or in vaults. Stormwater passes through the sand that filters out particulate pollutants.
Infiltration	A normally dry basin which temporarily stores stormwater until it soaks through the bottom and sides of the basin, and infiltrates into surrounding soil. Treatment is by filtration in the bed of the infiltration basin.

TABLE 4.3 APPROPRIATE USES FOR WATER QUALITY TREATMENT BMPs

POLLUTANTS TO REMOVE	APPROPRIATE TREATMENT BMPs
Oil/Grease Sources: vehicle and equipment areas, industrial areas, food preparation	Oil/water separators, catch basin inserts, catch basin sump/vault filters, patented stormwater treatment devices.
Sediments/Solids Sources: sand/gravel storage, construction sites, unpaved areas, agriculture/livestock uses	<p><u>For coarse sediments</u> – Wet pond/vault, constructed wetland (with forebay), vegetated biofilter; sand filter, catch basin insert, catch basin sump/vault filters, patented treatment devices.</p> <p><u>For fine sediments</u> – Wet pond/vault constructed wetland (with forebay), vegetated biofilter, sand filter, catch basin sump/vault filters, patented stormwater treatment devices.</p>
Phosphorus Compounds Sources: detergents/cleaners, fertilizers, organic matter, animal wastes	<p><u>For particulate phosphorus</u> – Wet pond/vault, constructed wetland (with forebay), vegetated biofilter, sand filter, patented stormwater treatment devices.</p> <p><u>For dissolved phosphorus</u> – A large “oversized” wet pond or sand filter.</p>
Nitrogen Compounds Sources: fertilizers, animal wastes, organic matter	<p><u>For particulate phosphorus</u> – Wetpond/vault, constructed wetland (with forebay), vegetated biofilter, sand filter.</p> <p><u>For dissolved nitrate</u> – Constructed wetland.</p>
Metals Sources: industrial area, vehicle and equipment areas, paints, pesticides	<p><u>For particulate metals</u> – Wet pond/vault, constructed wetland (with forebay), vegetated biofilter, sand filter.</p> <p><u>For dissolved metals</u> – Leaf compost filter or constructed wetland.</p>
Fecal Coliform Bacteria Sources: animal wastes; fertilizers	Other than an infiltration BMP, there is no treatment BMP that can reliably reduce fecal coliform bacteria to acceptable levels. Some studies have shown constructed wetlands provide some benefit.
pH Sources: metal plating, printing/graphic industries, cement/concrete production, cleaners	A constructed wetland can neutralize some ranges of pH.
BOD and Trace Organics Sources: organic debris, food wastes, some chemical wastes	<p><u>For particulate BOD</u> - See “particulate nitrate” above.</p> <p><u>For dissolved BOD</u> - A constructed wetland will remove some dissolved BOD and trace organics; more reliable performance requires activated carbon.</p>

BMP Information Sheet 8: Oil/Water Separator

Application and Description

An oil/water separator is a device designed to remove oil, grease, and similar floatable pollutants from stormwater runoff. The name commonly refers to an underground vault structure; however, more simple designs exist.

Oil/water separators are appropriate at locations where petroleum products and/or byproducts cannot be effectively controlled with source-control BMPs. An oil/water separator can be a simple tee section in a catch basin that traps floating materials, or a complex unit that is more expensive and maintenance-intensive.

For many sites, such as small parking lots, a simple tee section in a catch basin will temporarily retard pollutants, making it possible to clean up a spill before pollutants leave the site. On sites with greater potential for oil spills and high concentrations of oil and grease in runoff, such as a fleet vehicle lot, auto repair shop, or fueling station, a more complex oil/water separator is needed. Ideally, the separator should be built to bypass large flows and trap smaller flows.

Simple tee sections can be placed in catch basins in the primary conveyance system. Because of their simplicity, there are few restrictions on their application and locations of use.

There are at least two types of complex oil/water separators commonly used in situations where oily runoff is a significant concern: the American Petroleum Institute (API) and the coalescing plate interceptor (CPI). The API separator has the appearance of a long septic tank. An API separator must be large relative to the area it is treating to be effective. By placing coalescing plates in the separator, its size can be significantly reduced while retaining the efficiency needed. Consequently, the CPI separator is more commonly used. The relatively high cost of the plates is offset by the savings from reducing the cost of vault construction. In addition to these two standards, vendors are marketing new types patented of treatment devices that perform as oil/water separators.

Oil/water separators should be used for targeted pollutant removal in heavily oiled areas rather than as an all-purpose stormwater treatment facility. The separator will function more efficiently and require less maintenance if the amount of stormwater passing through is limited. Only runoff that has been exposed to high oil activity areas should be directed through the oil/water separator. Avoid directing stormwater (from other areas on your site) through the separator. A flow splitter should be used to route higher storm flows around the oil/water separator.

Design and Maintenance

Oil/water separators should be designed and sized in accordance with the Clark County Stormwater and Erosion Control Ordinance and the 2005 Stormwater Management Manual for Western Washington (Ecology Manual).

Oil/water separators must be checked at least weekly during the wet season. How often material should be removed depends on the amount of petroleum in the influent, but the separator should be cleaned at least quarterly, and particularly in the fall before the first storm of the wet season. All residuals removed from the surface and vault bottom must be disposed of properly. In addition, the following maintenance requirements apply.

- Oil absorbent pads should be replaced as needed, but should always be replaced in the fall prior to the wet season, and in the spring.
- The effluent shutoff valve is to be closed during cleaning operations.
- Waste oil and residuals shall be disposed of in accordance with current requirements. Several vendors handle waste oil hauling and disposal.
- Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at a discharge location approved by the local government.

End of BMP Information Sheet #8

BMP Information Sheet 9: Catch Basin Insert

Application and Description

A catch basin insert is a device installed under a storm drain grate to provide water quality treatment by filtering sediment or by absorbing oils. The following description is based on reports by Snohomish County (March 1998) and the Catch Basin Insert Committee (October 1995).

Catch basin inserts are commercially available products which fit into existing catch basins and are generally configured to remove one or more of the following contaminants: coarse sediment, oil and grease, and litter and debris. While it has been suggested that some units may be able to remove dissolved pollutants and pollutants associated with fine sediments, the County is not aware of independent tests that have confirmed this. Some catch basin inserts that trap sediment ease sediment removal from catch basins. When selecting a system, ensure that your specific pollutant-removal needs are met. As with any treatment BMP, catch basin inserts should never be used in place of sound source control practices. They are especially useful for trapping sediment in “self-cleaning” catch basins that lack a sediment trapping sump.

Oil and Grease Removal: Inserts designed for the removal of oil and grease contain, and depend on, oil-absorbing media. These inserts are appropriate for use in any area in which vehicles are used or stored. Because of the small storage capacity of these inserts (about 1 quart of oil under ideal conditions), they are not acceptable as the sole line of defense against actual oil spills in areas where larger amounts of oil could be released. Large amounts of sediment entering the catch basin significantly reduces the effectiveness and longevity of the oil absorbing media. Under these conditions, an oil/water separator with a pre-settling chamber, may be more appropriate.

Sediment Removal: Tests indicate that these units do little to remove silt or clay sized particles and dissolved pollutants. Therefore, they should not be considered a substitute for other pollutant-removal BMPs. Inserts designed for sediment removal may be used at construction sites, and in situations where stockpiles or unpaved areas are likely to contribute high loads of sand-sized or coarser sediment. They may also be appropriate for small (low traffic) businesses in which the per-inlet cost of cleaning would be excessive. The tendency for sediment to “wash out” compromises the ability of inserts to trap sediment. Use of inserts may reduce the need for use of expensive methods to clean catch basins.

Debris Removal: Inserts can also be used for the removal of litter and debris. Some evidence suggests that the removal of large debris such as cigarette butts, candy wrappers, and beauty bark reduces the amount of harmful bacteria in receiving waters.

Design and Maintenance

Unlike most other treatment BMPs, which must be designed and constructed specifically for your site, catch basin inserts may be purchased directly from a vendor and installed by the user. While standardized units are available, most vendors are able to customize their systems for your site. This service may dramatically improve the performance of your system while adding relatively little to the cost of the product. Before purchasing a catch basin insert, the following factors must be considered.

Conveyance Capacity: The conveyance capacity refers to the amount of water that the system can pass without causing flooding. This capacity is equal to the amount of water able to pass through the insert's treatment area, plus the amount that can pass through the built-in overflow structure. In order to minimize the chance of flooding, the insert should be able to pass the maximum expected flow from the area draining to the catch basin. In most cases, the vendor should be able to tell you what the overflow capacity is.

Treatment Capacity: The treatment capacity refers to the amount of water that the unit will pass through its treatment area. As the unit treats the stormwater, the treatment area begins to clog. If maintenance is neglected or an unusually high amount of sediment or debris enter the system, the treatment capacity ceases and all of the water will have to exit through the overflow. The ability of the unit to remove sediment is compromised if water is able to seep between the storm-drain grate and the edge of the pavement. Ensure that this gap is sealed. The vendor should provide you with information on how to prevent this situation and information on the treatment capacity of the system.

Maximum Weight: The maximum weight of the filter will be equal to the weight of the unit when new, plus the weight of the sediment and water trapped in the unit. Under the most extreme cases, the treatment area of the unit may become completely clogged, and the unit may be full of water when it comes time to service it. It is essential that the maximum weight of the unit be less than what can be lifted by the people or equipment to be used during maintenance. Before ordering a system, or having a system customized to your site, be sure the vendor knows how you will be removing the unit for maintenance.

Simplicity and Durability: Since the installation of one or more catch basin inserts represents a long-term commitment to maintenance, it is important that the unit selected be easy to use and maintain, and that it is built to last. Be sure to have the vendor provide a complete demonstration of the product at your site, and if possible, ask to try a unit for a month or so before committing to its purchase and use.

Maintenance: Catch basin inserts will generally require more frequent maintenance than other treatment BMPs. Frequent inspection of the units is necessary to ensure that they are not clogged by large debris. Actual maintenance will generally consist of removing the unit from the catch basin, cleaning or replacing the filter media (if applicable), and reinstalling the unit. In addition to the weight considerations mentioned above, you must ensure that the drain-inlet will not be obstructed when it is time to clean the filter, that you have the time and personnel to do the job (or can arrange for this service through a private contractor), and that you have a legal means of

disposing of the trapped material and spent media. In most cases, these materials may be disposed of as regular solid waste; however, media used for oil and grease removal may require special treatment. See BMP Information Sheet 2 in this chapter and resources in Chapter 6 for more information on disposal.

Maintenance frequency will vary depending on the amount and type of pollutant targeted. Tests conducted by Clark County suggest that initially, all units should be inspected every one to two weeks (except during periods of dry weather), and that complete maintenance will be required approximately monthly. Units configured simply to catch litter and debris may work for several months without maintenance. The simplest way to determine whether the units need maintenance is to inspect them during a rainstorm and see whether water is exiting out the overflow. If this is the case, the unit is probably in need of service. Alternatively, the depth of sediment accumulation or appearance of the filter media may provide insight as to whether the unit is in need of maintenance. Again, be sure the vendor provides you with this information.

Maintenance cost may be higher than for routinely pumping sediment from catch basin sumps using specialized equipment. Conversely, catch basin inserts can be removed and cleaned or disposed without using special equipment.

End of BMP Information Sheet 9

BMP Information Sheet 10: Catch Basin Sump and Vault Filters

Application and Description

Catch basin sump and vault filters are devices installed underground to provide water quality treatment through filtration, settling, or absorption. These are similar to, but larger than catch basin inserts.

In the Puget Sound Basin, several new but unproved technologies are being developed which are based on the installation of a filter media wall or cartridge in a catch basin sump, pipe system, or existing vault. The fundamental difference between these systems and the catch basin insert is that sump and vault filters take advantage of the natural settling characteristics of the existing drainage system. By allowing coarse sediment to settle out before reaching the filter surface, the life of the filter will be increased. If the filtering media is subject to the entire sediment load, they tend to clog after only a few inches of rainfall.

Sump and vault filters used so far have been designed to remove oil and fine sediments. Currently, efforts are under way to develop filter media to remove dissolved metals and nutrients. However, these options are not likely to be available for several years. While very little information exists about the performance of sump or vault filters, the likelihood that new products will be developed and the strong interest of government agencies and pollution-control firms make them worth considering. Those considering these space saving and potentially low-cost options should contact the Clean Water Program for information on the latest technology.

Design and Maintenance

All of the design considerations regarding filtration capacity, overflow capacity, and media selection that were discussed in BMP Information Sheet 9 - Catch Basin Inserts apply to sump and vault filters. In addition, the variety of conditions in the drainage systems in which these systems could be installed requires that care be taken to ensure the more generic versions of this technology will function properly. The ability of the absorptive media to survive extended periods of immersion must also be considered.

Maintenance of sump and vault filters will generally be more difficult, but less frequent, than for catch basin inserts. While systems installed in the sump of a smaller catch basin may be maintainable from the surface, those installed in larger catch basins and vaults will need to be maintained by persons trained in and equipped for confined-space entry. *Under no circumstances should an individual enter a tank, vault, or manhole without appropriate training and equipment.*

End of BMP Information Sheet #10

BMP Information Sheet 11: Leaf Compost Filters

Application and Description

Leaf compost filters are filtering and treatment structures installed above or below ground. They include a patented technology that uses cartridges filled with leaf compost pellets to remove pollutants from stormwater.

Leaf compost filters are commercially available products which provide three modes of removal: filtration, ion exchange, and adsorption. They are particularly effective in removing metals and some organic pollutants. They are also effective for moderate concentrations of oil and grease and suspended solids. Leaf compost filters should NOT be used in areas where nutrient loadings are a concern. These filters release dissolved phosphorous and are not a good choice if the business is located in the watershed of a phosphorous sensitive lake.

Leaf compost filters are well-suited for use in urban areas where land costs are high and space for treatment facilities is lacking.

Design and Maintenance

Leaf compost filters should be designed in accordance with the Clark County Stormwater and Erosion Control Ordinance. Ease of access for maintenance should be considered when selecting the site. The vendor can provide details for design to meet local requirements.

Maintenance is generally contracted through the vendor.

End of BMP Information Sheet #11

BMP Information Sheet 12: Wet Pond, Wet Vault, or Constructed Wetland

Application and Description

Wet ponds, wet vaults, and constructed wetlands are facilities that maintain a permanent pool of water for removing settleable solids, particulate pollutants, and some dissolved pollutants from incoming stormwater runoff.

A wet pond is a basin with a permanent pool of water to enhance pollutant removal. In a wet pond, wetland vegetation may grow along the pond edge. A constructed wetland is heavily vegetated along the edges and through the center of the pool. The pool depth in a wet pond typically ranges from three to six feet, but is much less in a constructed wetland. A wet vault is essentially an underground pond with walls and without vegetation. Because of the lack of vegetation, a wet vault is incapable of removing dissolved pollutants.

A wet pond and constructed wetland are large facilities requiring a considerable amount of space. A wet vault, however, is an underground system, less dependent on above ground area.

At existing businesses and public agencies, wet ponds and constructed wetlands will likely only be used when the site has an older stormwater detention pond, which has the appropriate characteristics for conversion. A new wet vault is probably the most suitable system for businesses that do not have space for an above ground treatment facility.

Numerous field studies indicate these systems are able to remove the majority of the settleable solids and particulate pollutants in stormwater. The amount of pollutants removed is directly related to the size of the pond. Although these three BMPs have the potential to provide different levels of treatment, particularly in regard to dissolved pollutants, they are placed together because there is insufficient data to distinguish their performance at removing pollutants.

Design and Maintenance

These facilities are to be designed in accordance with the *Clark County Stormwater and Erosion Control Ordinance*, if possible. If the site already has a detention facility, it may be possible to convert it to a treatment BMP.

Maintenance should follow standards specified by the *Stormwater Management Manual for Western Washington* (Ecology Manual) or County Code requirements.

End of BMP Information Sheet #12

BMP Information Sheet 13: Vegetated Biofilters

Application and Description

A vegetated biofilter is an earthen channel, strip, or swale in which pollutants are removed from stormwater by filtration through grass, settling, and infiltration through soil (in some cases).

There are two general configurations of vegetated biofilters: *biofiltration swale* and *filter strip*. A swale is a long, gently sloped, flat-bottomed ditch. Vegetation on the swale bottom treats water as it passes through the swale. Grass is the most common vegetation, although wetland vegetation is used if ponding or continuous surface water flows are encountered. A filter strip treats sheet flow and is placed parallel to the contributing surface and flow is across the shorter width. Grass is the most common vegetation for filter strips, although emergent wetland vegetation is sometimes used.

Field studies in western Washington have shown that well-maintained swales will remove the majority of the suspended solids and particulate pollutants. They may remove some dissolved pollutants, but field data are too limited to draw definitive conclusions. Areas having very oily runoff should include an oil control BMP before the swale.

For existing sites that lack treatment BMPs, vegetated biofilters may be added by converting landscaped areas. Another possible application reconfiguring parking areas to add grass strips around existing catch basins.

Design and Maintenance

These facilities are to be designed in accordance with the Clark County Code, Chapter 40.430, Stormwater and Erosion Controls. A flow spreader at the inlet of the swale may enhance the use of the entire swale width. By passing flows greater than the design storm reduces the risk of damage. Filter strips must only be used where sheet flow of runoff occurs. If runoff becomes concentrated, a biofiltration swale should be used.

Maintenance standards in the Stormwater Management Manual for Western Washington and County Codes must be followed.

End of BMP Information Sheet #13

BMP Information Sheet 14: Sand Filter

Application and Descriptions

Sand filters consist of a layer of sand underlain by gravel in which runoff is filtered through to remove pollutants, collected in underground pipes, and returned back to the stream or channel.

Sand filters can be used to remove particulate pollutants, including suspended solids and some metals. They are also able to reduce nutrient levels. They are very adaptable, able to be used in areas with thin soils, high evaporation rates, low soil infiltration rates, and limited space. Sand filters and peat sand filters can be used to treat stormwater runoff from small infill developments and from small parking lots (i.e., gas stations, convenience stores). Sand filters can either be placed in the landscape, with grass grown on top, or in vaults.

The sand filter should be sized according to the Clark County Code, Chapter 40.380, Stormwater and Erosion Control. Regular maintenance is critical to ensure effective functioning and pollutant removal. Experience with commercial and residential stormwater indicates that the surfaces of sand filters require semiannual cleaning. Failure to periodically clean the filter surface will eventually require replacement of the entire sand bed. Follow standards specified in the Stormwater Management Manual for Western Washington or County Codes.

End of BMP Information Sheet #14

BMP Information Sheet 15: Infiltration

Application and Descriptions

Infiltration uses the natural filtering ability of soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually filters through the soil and eventually into the water table.

Infiltration systems have traditionally been used to dispose of excess runoff in well-drained soils or areas lacking storm drains. They have more recently been applied to runoff treatment situations. Infiltration of stormwater through soil can be effective at removing most pollutants; however, for the soil to be able to treat runoff and capture pollutants, one of three situations must exist: 1) the soil must be fine-grained, 2) it must have a high organic content, or 3) it must have a high cation exchange capacity. In addition to treatment, infiltration has the benefit of reducing streambank erosion and enhancing dry season stream flows.

Infiltration facilities can be either ponds or vaults that may be used on small to large developments. It is also possible to use modular pavement or concrete grid for infiltration on smaller sites. Modular pavement and concrete grid are lattice grid structures with grassed, pervious material placed in the openings where water can thus drain through the open areas of the grid into the soil below. Porous and grid pavements can only be used in areas with no traffic or low-volume parking.

There are two different retrofit situations to consider. The first situation is a development that is currently disposing stormwater to an infiltration system without pretreatment, which due to circumstances is degrading groundwater quality. Pretreatment of the stormwater is essential for discharge to coarse soils to protect groundwater quality. Pretreatment is also required to prevent premature clogging of the infiltrative surface. The other treatment BMPs presented in this chapter can be used for pretreatment to resolve this problem.

The second situation is a development that currently disposes its stormwater to a piped system, but its soils are suitable for at least partial infiltration. Again, soil type plays an extremely important role in the performance of infiltration systems. To have the characteristics listed above, soils must contain loam and/or fine sand and silt.

An infiltration system is not appropriate at industrial sites where spills of hazardous chemicals may occur unless strict controls are in place that prevent spills from reaching the infiltration system.

Design and Maintenance

Infiltration systems for water quality are to be designed and maintained in accordance with Clark County Code, Chapter 40.380, Stormwater and Erosion Control. Maintenance should follow the *Stormwater Management Manual for Western Washington* or County Code.

CHAPTER 5. AGENCY REQUIREMENTS

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The purpose of this chapter is to provide you with information on a variety of federal, state, and local regulatory areas which may relate to your implementation of BMPs. In many cases, these summarized regulations have requirements that, if properly adhered to, will also prevent or reduce stormwater pollution. Seventeen regulatory programs are briefly described.

This information is intended as a short introduction. Before taking any action on the regulations discussed here, contact the appropriate agency for the complete information to ensure full compliance.

Besides the Water Quality Ordinance, other federal, state, and local regulations may relate to your implementation of best management practices.

REGULATION 1: Water Quality (CCC Chapter 13.26A)

The purpose of Clark County Code (CCC), Chapter 13.26A ,Water Quality, is to protect the County's surface and groundwater quality by providing minimum requirements for reducing the discharge of contaminants into the County's surface and stormwater systems. The code "prohibits the discharge of contaminants into surface and stormwater and groundwater, and mandates preventive measures to reduce contaminants from entering such waters." The code gives the County authority to investigate possible violations and to take such actions as required to enforce its provisions.

The code applies to all people within unincorporated areas, existing businesses and residents, as well as construction activities not covered by the existing Clark County Stormwater and Erosion Control Code.

Chapter 13.26A makes it unlawful for any person to discharge any contaminant into surface and stormwater or groundwater. Discharge is broadly defined to include indirect discharges associated with stormwater runoff, and direct discharges through spills, dumping, or other releases of contaminants. Illicit connections to the storm sewer system or a water body is prohibited. Prohibited contaminants include, but are not limited to, trash or debris, construction materials, petroleum products, antifreeze and other auto products, particulate or dissolved metals, flammable or explosive or radioactive materials, batteries, acids, alkalis, bases, paints, stains, resins, lacquers, varnishes, degreasers, solvents, drain cleaners, pesticides, herbicides, fertilizers, steam cleaning waters, soaps, detergents, ammonia, swimming pool backwash, chlorine, bromine and other disinfectants, heated water, domestic animal waste, sewage, recreational vehicle waste, animal carcasses, food wastes, bark and other fibrous materials, collected lawn clippings, leaves or branches, silt, sediment or gravel, dyes, chemicals not normally found in uncontaminated water, swimming pool water, potable water and potable water line flushing, and any hazardous material or waste not listed above.

Chapter 13.26A also lists 14 actions or substances as being allowable discharges. These are: lawn watering, uncontaminated water from crawl space pumping or footing drains, flows from riparian habitats and wetlands, dechlorinated swimming pool water if dechlorinated to a concentration of 0.1 parts per million or less, pH adjusted and controlled to prevent erosion and sediment transport, materials placed as part of an approved habitat restoration or bank stabilization project, air conditioning condensate, springs, diverted stream flows, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped groundwater, irrigation water from agricultural sources that is commingled with stormwater, certain discharges from boats, and common practices for well water disinfection if dechlorinated to a concentration of 0.1 parts per million or less, pH adjusted and controlled to prevent erosion and sediment transport, and other discharges as determined by the director.

The code directs the Clark County Public Works Department to develop a manual that requires the use of BMPs to control contaminants. In applying the manual, the County first requires the

use of source-control BMPs. If these are not sufficient, the County may require the treatment BMPs.

People exempt from following the BMP manual include people conducting normal residential activities on lots containing a detached single-family dwelling, duplex, or triplex, unless the director determines that these activities pose a hazard to public health, safety, or welfare; and people who are implementing BMPs through another federal or state water resources protection program. The County has authority require BMPs if the alternative BMPs are ineffective at reducing the discharge of contaminants to County storm sewers.

REGULATION 2: Stormwater Requirements for Development and Construction

This section describes County stormwater and erosion control requirements that apply to new development and redevelopment.

Stormwater and Erosion Control (CCC Chapter 40.380 and 13.25)

This is a summary of requirements of the Clark County Stormwater and Erosion Control Ordinance, as it applies to new development and redevelopment. Clark County has adopted the minimum requirements set forth in Ecology's *2005 Stormwater Management Manual of Western Washington*. These minimum requirements are applicable to new development, redevelopment, and drainage projects. They require drainage review and set requirements to control the flow and quality of stormwater runoff. The erosion control requirements are applicable to all land disturbing activities and construction activities.

The applicability of the minimum requirements for stormwater management is dependent on the area of constructed impervious surfaces and land disturbing activities. All new development and redevelopment projects that have 2,000 square feet or more of added, replaced, or added plus replaced impervious surface and entail 7,000 square feet or more of land disturbing activities are required to implement the following.

- Preparation of stormwater site plans – Provide a narrative detailing the development layout, offsite analysis, stormwater control plan.
- Construction Stormwater Pollution Prevention Plan (SWPPP) – Provide a document detailing the erosion control plan for the project site.
- Source control of pollution – Implementation of BMPs that prevent stormwater from coming in contact with pollutants.
- Preservation of natural drainage systems and outfalls – Must maintain the natural drainage patterns from the project site.
- On-site stormwater management – Stormwater runoff must be dispersed, infiltrated, or retained onsite to the maximum extent practicable.

The erosion control requirements are for construction activities and are intended to control erosion of exposed soil, prevent sediment from leaving the site, protect water bodies and protect newly constructed stormwater facilities from existing sediment.

*For more information, Call:
The Clark County
Department of
Community
Development at:
(360) 397-2375.*

In addition to the requirements above, new development and redevelopment projects that exceed 5,000 square feet of new impervious surface, or converts 0.75 acres or more native vegetation to lawn or landscaped areas, or converts 2.5 acres or more of native vegetation to pasture must also implement the following.

- Runoff treatment –Water quality BMPs must be used to treat stormwater runoff from applicable impervious areas.
- Runoff control – A stormwater detention (or retention) facility must be installed according to a plan approved by the County.
- Wetlands protection – Discharges to wetlands shall maintain the hydrologic conditions necessary to support the existing and designated wetlands uses.

Refer to the Clark County Code, Chapter 40.380, for details.

The erosion control requirements are for construction activities and are intended to control erosion of exposed soil, prevent sediment from leaving the site, protect water bodies, and protect newly constructed stormwater facilities from existing sediment

For more information, Call: The Clark County Department of Community Development at (360) 397-2375.

REGULATION 3: Fire Code Requirements

Storage of flammable, ignitive, and reactive chemicals and materials must comply with local fire codes. The exact requirements depend on the type, quantity, and location of the materials. Of particular pertinence are Article 79, Storage of Flammable and Combustible Liquids, and Article 80, Storage of Hazardous Materials.

✓ *For more information call the Clark County Fire Marshal.*

Storage of flammable, ignitive, and reactive chemicals and materials must comply with local fire codes.

For more information: Clark County Fire Marshal (360) 397-2375.

REGULATION 4:
Habitat Conservation (CCC Chapter 40.440)

The County requires that development activities near streams and in other sensitive habitat areas avoid habitat loss. The County is considering revisions to this ordinance to include provisions for livestock set backs from streams or other requirements for existing activities.

✓ *Contact Clark County Community Development at (360) 397-2375 for more information.*

REGULATION 5: Solid Waste (Clark County Health Department)

The Clark County Health Department has adopted Washington State Administrative Code Chapter 173-304, Minimum Functional Standards for Solid Waste Handling. In addition, the County has solid waste regulations under Chapter 24.12. These regulations include requirements on several aspects of solid waste that may overlap with concerns about stormwater quality: used oil, garbage containers, animal waste disposal, and composting.

According to the State Law

1. Used oil shall not be disposed of in the household collection system, public sewer system, on-site sewage system, to surface or groundwater, or onto or under the ground surface.
 2. Garbage must not be stored uncovered for more than three days. Organic material must not be stored on the ground for more than three weeks.
 3. Pet wastes are to be disposed of in a manner that does not create a nuisance; they may be disposed of in a sanitary sewer or in garbage sewer but not into a septic tank.
 4. Commercial composting facilities must follow state guidelines, which include the use of leachate containment and on-site treatment systems. Compost facilities must also use impervious areas to reduce leachate infiltration.
 5. Household hazardous wastes may be taken to the local transfer station for disposal at no additional cost to the generator.
- ✓ *Contact the Clark County Health Department at (360) 397-8428 for more detailed information.*

*For more information: Clark
County Health Department (360)
397-8428.*

REGULATION 6: Septic Tanks (Clark County Health Department)

Where wastewater cannot be discharged to a sanitary sewer, it may be possible to use a septic tank and drainage field. Only wastewater that is comparable to residential sewage in strength and constituency may be disposed of in septic systems. Hazardous chemicals may not be disposed in septic systems. The flow rate must be less than 14,500 gallons per day. Regulatory requirements from the State Department of Health must be followed if a more sophisticated treatment system is to be used, or if the flow is greater than 14,500 gallons per day.

The specifications for individual on-site sewage systems are presented in the Clark County Health Department Board of Health regulations. The information presented here is of particular relevance to commercial properties.

1. Soil evaluations must be conducted on the site before any other site plans are prepared.
2. Design must comply with Design Guidelines for Larger On-site Sewage Systems (December 1979), by the Washington State Departments of Ecology and Social and Health Services.
3. Prior to construction, plans and specifications must be submitted for approval.
4. A preliminary report is to be submitted to the Health Department prior to or concurrent with the preparation of the Plans and Specifications. Contents of this report can be obtained from the Health Department.
5. A detailed operation and maintenance manual must be prepared.

The above items are to be prepared by a certified sewage disposal designer or professional engineer.

Only wastewater that is comparable to residential sewage in strength and constituency may be disposed of in septic systems.

For more information: Clark County Health Department (360) 397-8428

WAC 246-272A provides specifications on the following items.

1. Soil testing
 2. Tank volume
 3. Drainage field area including reserve area
 4. Design criteria for the tank, drainfield, and appurtenances
 5. Special systems such as sand filters and experimental systems
 6. Construction and inspection
 7. Monitoring
- ✓ *See Clark County Health Department, Environmental Health Division, Liquid Waste Program, for more detailed information. (360) 397-8428.*

REGULATION 7: Local Sanitary Sewer Requirements for Acceptance of Process Water or Stormwater

Discharging any kind of wastewater to the sanitary sewer system other than sanitary sewage (water from toilets, sinks, showers, etc.), requires approval from the local sewer authority. In Clark County, the local sewer agency can be a city, town, or a sewer district.

Process Wastewater

Process wastewater is any water which, during manufacturing, processing, or other activity comes into direct contact with, or results from, production or use of, any raw material, intermediate product, finished product, byproduct, or waste product. In order to be discharged to the sewer, this wastewater must meet specific limits for pollutants, such as heavy metals, and fats, oils, and greases. In some cases, pretreatment is necessary prior to discharge.

Discharging process wastewater to a sanitary sewer requires approval of the local sewer agency. Permission to connect to the sewer system is also required from the local sewer agency. The volume of wastewater, amounts and types of materials present, will determine the nature of discharge approval.

Other Types of Wastewater

In addition to process water and stormwater, there are also rules and regulations that apply to other types of water that may be discharged to the sanitary sewer, including cooling water, construction dewatering, and ground water from contaminated sites.

Stormwater

Stormwater is prohibited from being discharged to sanitary sewers. However, there may be situations where the discharge of small amounts of contaminated stormwater is allowed.

Discharging either process wastewater or stormwater to a public sanitary sewer requires approval of the local sewer agency.

*For more information:
Washington State Department of
Ecology, Vancouver Field Office
(360) 690-7171 or Olympia
(360) 407-6000.*

Pretreatment Requirements

In setting pretreatment requirements, the local sewer authority or Ecology must operate within state regulation WAC 173-216 (State Waste Discharge Permit Program), which in turn must comply with Federal Regulation 40 CFR 403.5 (National Pretreatment).

**REGULATION 8:
Discharge of Process Wastewater to Surface Water or Drainfields
(Washington State Department of Ecology)**

If a public sanitary sewer is not available, process wastewater must have suitable treatment prior to discharge to surface water or a drainage field. The approval of Ecology must be sought, both for the type and design of the treatment system, as well as the design and location of the outfall.

The Washington Department of Ecology must approve process wastewater discharges to surface water or a drainage field.

*For more information:
Washington State Department of Ecology:
(360) 690-7171 (Vancouver.
Field Office) (360) 407-6000.*

REGULATION 9: Dangerous Waste Generators (Washington State Department of Ecology)

The state dangerous waste regulations (Chapter 173-303 WAC) cover accumulation, storage, transportation, treatment, and disposal. Of interest to this manual is the temporary accumulation of waste until taken from the site to a permitted disposal site. Only those regulations that apply to temporary storage are summarized here.

Permitted Generators

Businesses that generate or accumulate 220 pounds or more of dangerous waste (approximately one-half of a 55-gallon drum) in any one month must comply with the storage specifications outlined below.

If placed in containers:

1. If the container is not in good condition (for example, severe rusting, apparent structural defects) or if it begins to leak, the owner must replace the container.
2. The container must be labeled as to its contents.
3. The container must be lined with a material that does not react with the waste.
4. The container must always be closed except when adding or removing waste.
5. The container must not be opened, handled, or stored in a manner that may cause a rupture or leak.
6. The container must be examined at least weekly for leakage.
7. Containers storing reactive or ignitable waste must meet requirements of the Uniform Fire Code.
8. Incompatible wastes must be stored separately.

The state dangerous waste regulations cover accumulation, storage, transportation, treatment, and disposal.

*For more information:
Washington State Department of Ecology
(360) 690-7171 (Vancouver)
(360) 407-6000 (Olympia)*

9. Ecology may require secondary containment of the storage area. Specifically, the storage area must:
 - a. Be capable of collecting and holding spills and leaks.
 - b. If uncovered, be capable of handling a 25-year storm.
 - c. Have a base that is free of cracks or gaps and is sufficiently impervious to leaks, spills, and rainfall.
 - d. Be sloped or designed so that liquids can drain to a point for removal.
 - e. Have positive drainage control (e.g., a valve) to ensure containment until any liquid is removed, which must occur in a timely manner.
 - f. Have a holding capacity equal to 10 percent of the volume of all containers or the volume of the largest container, whichever is greater.
 - g. Not allow runoff of rainfall from areas adjacent to the storage area.

If the waste does not contain free liquids, the above requirements need not be met, provided that the area is sloped or the containers are elevated.

If placed in tanks:

1. The tank must be lined with a material that does not react with the waste.
2. The tank, tank area, and its ancillary equipment must be inspected according to a written schedule.
3. If retired, the tank is to be cleaned of all contents.
4. Tanks storing reactive or ignitable waste must meet the Uniform Fire Code.
5. Incompatible wastes must be stored separately.

The generators must have a designated employee on site or on call with the responsibility for coordinating all emergency response measures. Spills are to be contained and cleaned up as soon as practicable.

REGULATION 10: Small-Quantity Waste Generators (Washington State Department of Ecology)

Small-quantity waste generators are businesses that generate or accumulate less than 220 pounds of dangerous waste per month or per batch (or 2.2 pounds of extremely hazardous waste). Staying under these quantities avoids detailed reporting and oversight by Ecology. Small-quantity generators still fall under Ecology regulations to the extent that the materials must be properly stored on site until shipment. The wastes must be shipped before 220 pounds are accumulated to maintain this status. Once the accumulation exceeds 220 pounds, the waste must be shipped within the next 180 days.

These businesses must dispose of the waste in a manner acceptable to Ecology and the Southwest Washington Department Health District. Options may include:

1. Disposal of the waste at a facility permitted by Ecology.
2. Disposal of the material at a recycling facility that legitimately recycles or reuses the waste.
3. Disposal of the waste to a permitted municipal or industrial landfill (with approval).

The Clark County Small Quantity Generators Program provides assistance to these businesses. See Chapter 6 for more information.

Dangerous Waste Pollution Prevention Plans

State law establishes the requirement that generators of dangerous wastes prepare a waste reduction plan, called a pollution prevention plan. The required content of the plan is set forth in *Pollution Prevention Planning—Guidance Manual*, January 1992, Publication #91-2, for WAC 173-307.

Many of the actions described in these plans may benefit stormwater quality and thus should be integrated into any decisions about the implementation of BMPs.

- ✓ *See Chapter 173-303 WAC and Chapter 173-307 WAC for further detail. Also “Pollution Prevention Planning Guidance Manual,” January 1992, #91-2, by Ecology.*

For more information about Small Quantity Generator assistance, call the Clark County Solid Waste Program at (360) 397-6118.

REGULATION 11: Groundwater Quality Protection (Washington State Department of Ecology)

In December 1990, Washington State adopted groundwater standards to prevent groundwater pollution (WAC 173-200). The following standards were established:

1. Chemical variables are limited (see the numerical limits shown below). Also shown below are typical stormwater contaminant levels are based on Oregon and Washington field data. Local groundwater data is from the U.S. Geological Survey.

Contaminant	Standard	Local Groundwater	Stormwater
Fecal Coliform	1 org/100 ml	0	1000
Nitrate	10 mg/l	2	0.50
Arsenic	0.0005 mg/l	0.001	0.005
Cadmium	0.01 mg/l	<0.001	0.0006
Chromium	0.05 mg/l	<0.001	0.008
Copper	1.0 mg/l	0.001	0.020
Lead	0.05 mg/l	<0.005	0.02
Mercury	0.0002 mg/l	<0.005	<0.0002
Zinc	5.0 mg/l	<0.003-0.150	0.150

Washington State has established numeric standards to prevent groundwater pollution.

2. Antidegradation requirements are included in the state regulations. The antidegradation standard states that if the quality of the groundwater already is better than the numeric limits, then the current groundwater quality must be maintained.
3. It requires that all activities with the potential to contaminate water implement BMPs that meet all known and reasonable treatment (AKART).
4. AKART must be used regardless of the quality of the groundwater.

*For more information:
Washington State Department of Ecology
(360) 690-7171 (Vancouver)
(360) 407-6000 (Olympia)*

5. In individual cases where AKART is not adequate to protect groundwater quality, the business must provide additional controls.
6. The standards do not apply to the root zone of saturated soils where pesticides or nutrients have been applied at agronomic rates for agricultural purposes.

✓ *See Chapter 173-200 of the Washington Administrative Code for more details.*

REGULATION 12: NPDES Industrial Stormwater Permit (Washington State Department of Ecology)

The NPDES program was established by federal regulation to improve the quality of stormwater from industries or industrial-type activities.

A business must obtain a permit for a facility only if its primary activity falls under one of the categories in the list that starts at the bottom of the page. If the facility has two types of businesses and the primary business is not subject to an NPDES permit, then a permit need not be obtained for the facility. If the facility has two business activities and only the primary business falls under one of the above categories, the permit need not include the area where the secondary business is occurring if its stormwater discharges to its own drainage system. However, if it drains to the same system as the primary business, the entire drainage system is covered by the permit and the BMPs must cover both business activities.

The program requires the submission of a Notice of Intent to the Department of Ecology, the preparation of a stormwater pollution prevention plan (SWPPP), and compliance with other permit conditions. The SWPPP must include an assessment of pollutant sources and pollutants, a site map, description of BMPs to be implemented, and an implementation schedule.

The 11 categories listed below are required to have NPDES stormwater permits.

1. Facilities subject to federal regulations under 40 CFR Subchapter N, except facilities with toxic pollutant effluent standards already covered by a different permit program. Exempted industries that may be present in Clark County: coal mining, sand and gravel mining, and paving and roofing material production.

Some businesses must obtain a NPDES permit to improve the quality of stormwater runoff from their sites.

*For more information:
Washington State Department of Ecology
(360) 690-7171 (Vancouver)
(360) 407-6000 (Olympia)*

2. Facilities listed under the following standard industrial classifications (SIC):
 - 24 Lumber and wood products except: 2434 - kitchen cabinets
 - 26 Paper and allied products except: 265 - paperboard containers and 267 - converted paper and paperboard products
 - 28 Chemicals and allied products except: 283 - drugs
 - 29 Petroleum and coal products
 - 311 Leather tanning and finishing
 - 32 Stone, clay and glass products except: 323 - glass products made from purchased glass
 - 33 Primary metals industries
 - 3441 Fabricated structural metal
 - 373 Ship and boat building/repairing

3. Facilities classified as SIC 10 through 14:
 - 10 Metal mining
 - 12 Coal mining
 - 13 Oil and gas extraction
 - 14 Mining and quarrying of nonmetallic minerals, except fuels

There are some special conditions for the above facilities. See Ecology's General Industrial Permit for these conditions.

4. Hazardous waste treatment, storage, or disposal facilities.
5. Landfills, land application sites, and open dumps.
6. Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automobile junk yards classified as SIC 5015 and 5093.
7. Steam electric power generating facilities.
8. Transportation facilities shown below if they have either vehicle maintenance shops, equipment cleaning, or airport deicing. Only the portion of the facility with these activities and activities listed under the other 10 categories need be permitted.
 - 40 Railroad transport
 - 41 Local/interurban passenger transport
 - 42 Motor freight transport and warehousing except: 4221 - farm product warehousing and storage; 4222 - refrigerated warehousing; 4225 - general warehousing and storage
 - 43 United States Postal Service
 - 44 Water transport
 - 45 Transport by air
 - 5171 Petroleum bulk stations/terminals
9. Treatment works, including domestic sewage or any other sewage sludge or wastewater treatment device or system used in the storage, treatment, recycling, and reclamation of

municipal or domestic sewage, and land dedicated to the disposal of sewage sludge. Not included are farm lands, domestic gardens, or lands used for sludge management where sludge is beneficially reused.

10. Construction, except for operations that disturb less than 5 acres of total land area that are not part of a larger common plan of development or sale.
11. Facilities with these SICs if outside activities are exposed to stormwater.
 - 20 Food and kindred products
 - 21 Tobacco products
 - 22 Textile mill products
 - 23 Apparel/other textile products
 - 2434 Wood kitchen cabinets
 - 25 Furniture and fixtures
 - 265 Paperboard containers/boxes
 - 267 Converted paper/paper board products
 - 27 Printing publishing products
 - 283 Drugs
 - 285 Paints, varnishes, lacquers, enamels, and allied products
 - 30 Rubber and miscellaneous plastic products
 - 31 Leather and leather products except: 311 - leather tanning
 - 323 Glass products made of purchased products glass
 - 34 Fabricated metal products except: 3441 - fabricated structural metals
 - 35 Industrial and commercial machinery and computer equipment
 - 36 Electronic/electrical equipment
 - 37 Transportation equipment except: 373 - ship/boat building & repair
 - 38 Measuring, analyzing and controlling instruments, photo, medical/optical goods, watches/clocks
 - 39 Misc. manufacturing industries

 - 4221 Farm product warehousing and storage
 - 4222 Refrigerated warehousing/storage
 - 4225 General warehousing/storage

REGULATION 13: Underground Storage Tanks (Washington State Department of Ecology)

Businesses with underground storage tanks must comply with regulations in Chapter 173-360 WAC. These regulations are for underground tanks (tank system having 10 percent or more of its volume underground) containing petroleum or listed hazardous substances.

Exempt Tanks

There are a variety of tanks that are exempt from these regulations. Consult State Code, Section 173-360-100 (2) for a complete list. Some exemptions include

1. Farm and residential tanks holding 1,100 gallons or less of motor fuel.
2. Tanks storing heating oil used on premises.
3. Tanks on or above floor of underground areas.
4. Septic tanks.
5. Tanks holding 110 gallons or less.
6. Emergency spill and overflow tanks.
7. Tanks that store dangerous waste, as defined or regulated by RCRA Subtitle I.
8. Flow-through process tanks.
9. Tanks that store regulated substances for the operation of equipment (i.e., hydraulic lift cylinders).
10. Wastewater treatment tanks that are part of wastewater treatment facilities.

Businesses with underground storage tanks must comply with Ecology regulations.

*For more information:
Washington State Department of Ecology
(360) 690-7171 (Vancouver)
(360) 407-6000 (Olympia)*

REGULATION 14: Spill Prevention and Control Plan (US EPA and Washington State Department of Ecology)

USEPA - Spill Prevention Control and Cleanup (SPCC) Plans (40 CFR 112)

This federal regulation requires that certain facilities engaged in drilling, producing, gathering, storing, processing, refining, transferring, or consuming oil and oil products are required to have a spill prevention and control plan (SPCC), provided that the facility is nontransportation related; and, that the aboveground storage of a single container is in excess of 660 gallons, or an aggregate capacity greater than 1,320 gallons, or a total below ground capacity in excess of 42,000 gallons.

The plan must

1. Be well thought out in accordance with good engineering.
2. Achieve three objectives: prevent spills, contain spills that occur, cleanup spills.
3. Identify name, location, owner, and type of facility.
4. Have date of initial operation and oil spill history.
5. Designate the person responsible.
6. Be approved and certified by the person in authority.
7. Contain a facility analysis.

✓ *See Federal Regulation 40 CFR 112 for further detail.*

Many businesses are required to have a prevention and control plan to prevent, contain, and clean-up spills.

*U.S. Environmental
Protection Agency
Region 10 – Seattle
1-800-424-4EPA or (206) 553-
1200*

*For more information:
Washington State
Department of Ecology
(360) 690-7171 (Vancouver)
(360) 407-6000 (Olympia)*

Ecology Dangerous Wastes (WAC 173-303)

The regulations require that large-quantity generators and permitted treatment storage and disposal facilities have a contingency plan that includes

1. Actions taken in the event of spill.
2. Descriptions of arrangements with local agencies.
3. Identification of the owner's emergency coordinator.
4. List of emergency equipment.
5. Evacuation plan for business personnel.

Medium-quantity generators should follow standards in Chapter 173-303-201 WAC.

- ✓ *See WAC 173-303 for further detail on who is covered by the Dangerous Waste Regulations and the specific requirements.*

REGULATION 15: Pesticide Regulations (Washington Department of Agriculture)

Washington State pesticide laws are administered by the state's Department of Agriculture, under the Washington Pesticide Control Act (RCW 15.58), Washington Pesticide Application Action (RCW 17.21), and regulations in WAC 16.202 and 16.228.

1. Persons who apply pesticides are required to be licensed with the following exceptions.
 - a. People who use general-use pesticides on their own or their employer's property.
 - b. Grounds maintenance people using only general-use pesticides on an occasional basis not amounting to a regular occupation.
 - c. Governmental employees who apply general use pesticides without utilizing any kind of motorized or pressurized apparatus.
 - d. Employees of a commercial applicator or a government agency who are under direct on-site supervision by a licensed applicator. Licensed applicators must undergo 40 hours of continuing education to keep the license.
 2. No person shall pollute streams, lakes, and other water supplies in pesticide loading, mixing and application.
 3. No person shall transport, handle, store, load, apply, or dispose of any pesticide, pesticide container, or apparatus in such a manner as to pollute water supplies or waterways, or cause damage or injury to land, including human beings, desirable plants, and animals.
- ✓ *See WAC 16.202 and 16.228 for further detail on the storage, handling and application of pesticides.*

Pesticide applicators must comply with appropriate state law concerning licensing, storage, handling and application.

*For more information:
Washington State Department of
Agriculture
Pesticide Management Division
(360) 902-2010 (Olympia)*

REGULATION 16: Air Quality (Southwest Clean Air Agency)

The Southwest Washington region is under the jurisdiction of a regional air quality authority, who in turn must function under Washington State and federal air quality regulations. The Southwest Clean Air Agency (SWCAA) is the regulatory agency for air quality in Clark County.

Of direct interest to this manual is air authority policies on fugitive dust and outside painting. SWCAA requires that reasonable precaution be taken to prevent fugitive particulate material from becoming airborne when handling, loading, transporting, or storing particulate material. SWCAA defines what are reasonable precautions, such as the paving of parking lots and storage areas; housekeeping measures (for example, sweeping) to minimize the accumulation of mud and dust and to prevent its tracking onto public roads; and stabilization of storage piles with water spray, chemical stabilizers, tarps, or enclosures.

SWCAA can require that reasonable precautions be taken to prevent the tracking of material onto public roads. One precaution is wheel-washing of trucks.

SWCAA requires that fugitive dust controls be used to prevent air pollution. Fugitive dust is defined as particulate matter or any visible air contaminant other than uncombined water that is not collected by a capture system and emitted from a stack, but is released at the point of generation. For many activities, such as construction, demolition, and stockpiling, use of water spray to control dust is specified by SWCAA as an acceptable practice.

SWCAA may also require that abrasive blasting and spray painting operations be performed inside a booth designed to capture the blast grit or overspray. Outdoor blasting or painting of structures or items too large to be handled indoors needs to be controlled through measures, such as curtailment during windy periods and enclosure of the area being painted or blasted with tarps. Containers of solvents and coatings are to be kept closed. The Compliance Guidelines specify how spraying equipment is to be cleaned. It also requires an operation and maintenance plan for spray operations.

✓ See “Agency Policy on Fugitive Dust Controls,” SWCAA, for detailed information on dust control requirements.

SWCAA requires that reasonable precaution be taken to prevent fugitive particulate material from becoming airborne, when handling, loading, transporting or storing particulate material.

For more information call Southwest Clean Air Agency (360) 574-3058 (Vancouver)

**REGULATION 17:
Requirements of Native American Tribes**

Tribal staff sometimes review federal, state, and local permits for projects on nontribal lands that may affect treaty-reserved resources or areas. Several tribes have continuing treaty interests in natural resources. Check with the Clark County Department of Community Development for more information on areas where tribal review may be an issue.

Several tribes have continuing treaty interests in natural resources.

CHAPTER 6. TECHNICAL & FINANCIAL ASSISTANCE

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Introduction

The quality of stormwater runoff from commercial and industrial developments, residential areas, and agricultural lands is of increasing concern with respect to protection of water resources in Clark County. Many of our water pollution problems are due to pollutants that are washed off the land during and following storms, eventually degrading surface and ground waters. The BMPs in Chapter 3 reduce the amount of pollutants entering our water.

This chapter provides information on where you may obtain technical and financial assistance for understanding, choosing, and designing appropriate BMPs for your site. The information is organized into these two broad categories of technical and financial assistance. Sources for technical assistance are then grouped according to subject, such as hazardous waste management and BMPs for automotive shops. This is not an inclusive list of sources of assistance but should provide a jump start on locating information.

In addition, a quick-reference phone list is included at the end of the chapter for all of the agencies, organizations, and programs described in the Technical and Financial Assistance sections.

Technical Assistance

There are a variety of organizations and programs that can offer technical assistance in selecting and implementing BMPs. These sources of information and assistance range from local and regional programs to state and federal agencies. Governmental entities, as well as private sector associations, are available to provide suggestions and guidance regarding the most effective and appropriate measures to take in order to protect the County's valuable water resources.

For best results, local organizations or programs should be contacted before federal or state agencies are consulted. This section provides names, contact information, and brief descriptions of several sources of information and assistance available to the businesses of unincorporated Clark County.

This chapter provides information on where you may obtain technical and financial assistance for understanding, choosing, and designing appropriate BMPs for your site.

For best results, local organizations or programs should be contacted before federal or state agencies are consulted.

In addition to the personal assistance offered by many organizations and programs, there is also a broad range of written materials available to help businesses select, design, and understand applicable BMPs for water quality protection. Many of these can be obtained free of charge from local associations or governmental agencies. This section also provides information regarding several publications, manuals, books, and newsletters that can help in the formation of pollution prevention strategies to protect Clark County's water quality.

General BMP Selection

Clark County Clean Water Program

The Clean Water Program can provide free on-site consultations to businesses for implementing the water quality BMPs in this manual

For information, or to request an on-site consultation, contact:

Clark County Clean Water Program
PO Box 9810, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4392

Trade/Business Associations

Local trade or business associations can be valuable sources of information for specific BMP applications on a business property. Many trade and business associations have developed pollution prevention information for the benefit of their members that is unique to their specific types of operations. Contact the appropriate trade or business association to obtain information, BMP assistance, and help in locating other businesses that are working out similar problems.

Sanitary Sewer Agencies

Local Sewer Agency

Contact the local sewer agency for information on what can be discharged to sewers.

City of Vancouver
Public Works, Sewer Permits: (360) 487-7804

Clark Regional Wastewater District: (360) 750-5876

City of Camas
Building: (360) 834-8861

City of Washougal
Building Department: (360) 835-8501

City of Ridgefield
Public Works Department: (360) 887-8251

City of Battle Ground
Public Works Department: (360) 342-5350

City of La Center
Clark Public Utilities: (360) 263-2782

Sewer service usually only exists in urbanized areas. If you are not served by sewer, check with the closest city or town to see if you are in the service area. The Clark Regional Wastewater District serves the area between Orchards and Felida.

If you have sewer service, the name of your local sewer agency is identified on your water and sewer bill.

Hazardous Waste Management

Hazardous Waste: A Guide for Small Quantity Waste Generators

This booklet contains information to help businesses that generate small quantities of hazardous waste understand and apply the laws that affect them. The guide includes information on hazardous waste regulations, a service directory, and sources to contact for more information.

To obtain a copy of this guide, or to request an on-site consultation, contact:

Clark County Solid Waste Program
PO Box 9810, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4016

Hazardous Waste On-site Consultations

The Environmental Services Division provides free on-site visits to businesses that request assistance. Only small-quantity waste generators or businesses that are potential small-quantity waste generators qualify for this service. Staff work with the business owner to help develop a practical hazardous waste handling program, find alternatives, reduce waste, and comply with regulations.

For information on the program or to request an onsite consultation, contact:

Clark County Solid Waste Program
PO Box 9810, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4016

Waste Characterization

Certain waste materials may need characterization to be disposed of as solid waste. The local solid waste disposal company can provide you with the requirements. No liquids are allowed for disposal as solid waste.

For information, contact:

Waste Connections

Telephone: (360) 695-4858

King County Business Waste Line

This Seattle-area program provides information on hazardous waste management to small businesses. The emphasis is on providing innovative and effective ideas for handling a variety of wastes and making compliance with waste-related regulations easier. They has developed industry-specific waste management brochures. Information can assist businesses that are implementing stormwater BMPs to control pollution from on-site wastes. In addition, the program maintains a network of contacts that individual businesses may use to locate similar businesses whose BMPs might work for their specific situation.

For information, contact:

King County Business Waste Line

Telephone: (206) 263-8899

Washington Toxics Coalition

The Washington Toxics Coalition is a nonprofit organization dedicated to providing information on reducing the use and production of toxic materials. The Coalition offers fact sheets, research materials, and personal assistance to individuals interested in reducing toxics (such as pesticides, solvents, cleaning chemicals, and a variety of other chemicals) and finding safer alternatives to toxic materials.

For written information or personal assistance, contact:

Washington Toxics Coalition

4516 University Way NE

Seattle, WA 98105

Telephone: (206) 632-1545

Washington State Department of Ecology Dangerous Waste Treatment Storage and Disposal Information

Ecology is the source of information on businesses that provide services in regard to dangerous waste treatment, storage, and disposal, and information on applicable regulations.

Contact:

Washington State Department of Ecology
Southwest Regional Office
Telephone: (360) 407-6300 (Olympia)

Washington State Department of Ecology
Vancouver Field Office
Telephone: (360) 690-7171

Commercial and Small Farms

Washington State University Cooperative Extension–Clark County

The Cooperative Extension offers a variety of educational services designed to promote sensitivity to water quality concerns in land development planning. Extension staff have expertise in several types of land uses, including agricultural production, livestock management, small farms, forestry, gardening, lawn care, and others. Several programs targeted at specific land use practices offer educational materials, workshops, conferences, and individual consultation for landowners and land managers. Cooperative Extension Service staff can make individual farm visits and advise on effective BMPs, supporting information, and other groups to contact for further information.

For information, contact:

WSU Cooperative Extension–Clark County
11104 NE 149th Suite C-100
Brush Prairie, WA 98686
Telephone: (360) 397-6060

Clark County Conservation District

The Conservation District and Natural Resources Conservation Service can provide technical assistance for a variety of stormwater pollution control efforts related to commercial farms and small farms. Advice is available on effective erosion-control practices and methods for specific site conditions, including stream bank stabilization and slope stabilization techniques.

For information, contact:

Clark County Conservation District
11104 NE 149th St Building C-400
Brush Prairie, WA 98606
Telephone: (360) 883-1987, ext. 5

Landscaping, Nursery, and Golf Course Practices

University of Washington Center for Urban Horticulture, Elisabeth C. Miller Library

The Center for Urban Horticulture is a valuable resource for information on environmentally sensitive gardening, landscaping, and nursery practices. The Center has the only horticultural library in the Northwest, the Elisabeth C. Miller Library. Although personnel are not available for answering individual questions on vegetation-related BMPs, the library is open to the public for information that can assist in determining effective BMP strategies.

Elisabeth C. Miller Library
3501 NE 41st Street
Seattle, WA 98195
For library hours, call: (206) 543-8616

Golf Course Best Management Practice Manual

The King County Department of Development and Environmental Services has a BMP manual specifically applicable to golf courses and their stormwater pollution concerns. The Golf Course BMP Manual provides details on environmentally sound site planning provisions, construction practices, vegetation planting and maintenance practices, pesticide use, and general golf course maintenance practices. This manual should be consulted for effective BMPs applicable to existing and proposed courses.

To obtain a copy of the manual, contact:
Clark County Clean Water Program
1300 Franklin Street, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4392

The Water Quality Action Manual for Greenhouse and Nursery Operators

This is a water quality protection guide for greenhouse and nursery growers that merges pollution control and prevention, economics, worker safety, and public relations into one easy-to-read manual. It was developed by the American Association of Nurserymen, the Society of American Florists, the Professional Plant Growers Association, and Roses, Inc.

To obtain a copy of this manual (the cost is \$25), contact:
AAN Publications
1250 I Street NW, Suite 500
Washington, D.C. 20005
Telephone: (202) 789-2900
Internet: www.anla.org
OR

See it at the Business Environmental Assistance Cooperative Library

Washington State University Cooperative Extension –Clark County

The Cooperative Extension offers a variety of educational services designed to promote sensitivity to water quality concerns in land development planning. Extension staff have expertise in several types of land uses, including agricultural production, livestock management, small farms, forestry, gardening, lawn care, and others. Several programs targeted at specific land use practices offer educational materials, workshops, conferences, and individual consultation for landowners and land managers. Cooperative Extension Service staff can make individual farm visits and advise on effective BMPs, supporting information, and other groups to contact for further information.

For information, contact:

WSU Cooperative Extension - Clark County
11104 NE 149th Suite C-100
Brush Prairie, WA 98686
Telephone: (360) 254-8436

Building and Land Use Requirements

Clark County Department of Community Development

The Community Development Department should be consulted to determine whether any permits may be required in constructing BMPs, modifying property layout, or otherwise altering a site to control runoff contamination. If permit requirements are overlooked or ignored, business or property owners may be subject to fines. The Community Development Department should be contacted while plans are being formed for BMPs, and before any action is taken, to determine permit applicability and potential fees.

For information, contact:

Clark County Department of Community Development
1300 Franklin Street
PO Box 9810
Vancouver, WA 98666-9810
Telephone: (360) 397-2375

Clark County Fire Marshal

Questions on specific fire code requirements for individual site conditions and potential BMP scenarios can be directed to the Clark County Fire Marshal's office.

For information, contact:

Clark County Fire Marshal
PO Box 9810
Vancouver, WA 98666-9810
Telephone: (360) 397-2375

Erosion Control Practices

Building Industry Association Guide to Erosion Prevention and Sediment Control

This manual is designed for use on building sites and provides easy to understand descriptions of erosion control BMPs on both small and large sites. The Homebuilders Association can also provide references on erosion-control products for use on construction sites as well as material suppliers who carry erosion-control products.

For information, contact:

Building Industry Association
Telephone: (360) 694-0933

Stormwater Management Manual for Western Washington

This manual was developed by Ecology as a model for local governments. Clark County regulations adopt most of the Technical Manual. It contains requirements for stormwater management system design, erosion control, and urban BMPs. Volume II discusses erosion and sediment control.

To obtain the manual, contact:

Washington State Department of Ecology
Publications Distribution Office
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472
Order by title and publication number 91-75

Or

Parts of the Manual may be available from Clark County Clean Water Program
Telephone: (360) 397-6118 ext. 4392

Clark County Conservation District

Clark Conservation District is dedicated to providing technical assistance and promoting conservation education to foster healthy relationships between the environment and people. The District has a wealth of information concerning water quality issues, management of small and large farming operations, and implementation of best management practices (BMPs).

For information, contact:

Clark Conservation District
11104 NE 149th St. C-400

Brush Prairie, WA 98606
Telephone: (360) 883-1987

Recycling and Reuse Practices

Clark County Solid Waste Program - Business Recycling

This program assists businesses with recycling by providing information on waste reduction and recycling services for your particular needs, helping you work with your employees to promote participation, offering information on buying recycled products, and providing you with ongoing support to ensure your program is successful. The program also runs “BRAG (Business Recycling Award Group),” a special program which recognizes individual business recycling efforts.

For more information, contact:

Clark County Solid Waste Program
1300 Franklin Street, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4352

Used Oil Collection or Reuse Programs

Used oil can be recycled or reused. The Solid Waste Program can provide information.

For information on used oil collection or reuse, contact:

Clark County Solid Waste Program
1300 Franklin Street, Vancouver, WA 98666-9810
Telephone: (360) 397-6118, ext. 4016

Shoptalk Newsletter

Shoptalk is a quarterly newsletter published by Ecology’s Solid and Hazardous Waste Program, that explains regulatory requirements. It includes updates on regulations and advice about waste reduction and recycling.

For information, contact:

Washington State Department of Ecology
Solid and Hazardous Waste Program
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6000

Solid Waste Disposal

Clark County Solid Waste Program

The Solid Waste Program can provide information on solid waste disposal issues.

For questions on where to dispose of questionable solid waste, contact:

Clark County Solid Waste Program
Telephone: (360) 397-6118, ext. 4352

For information on the disposal of construction, demolition, and land clearing debris, contact:
(360) 397-6118, ext. 4820

Boat and Marina Practices

Northwest Marine Trade Association

The Northwest Marine Trade Association is a business organization with experience in water pollution issues related to a variety of boat facilities. The association can offer advice on BMPs, as well as provide further contacts in Clark County area for more detailed information applicable to individual site conditions.

For information, contact:

Northwest Marine Trade Association
1900 North Northlake Way, Suite 233
Seattle, WA 98103-9087
Telephone: (206) 634-0911

Resource Manual for Pollution Prevention in Marinas

This is a 1998 Ecology manual.

To obtain a copy, contact:

Washington State Department of Ecology
Publications Distribution Office
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472

Order by title and publication number. The publication number is #9811.

Boat Building and Repair Facilities NPDES Waste Discharge Permit

Ecology has issued a general permit to cover boatyards (building and repair facilities). The permit includes information on appropriate best management practices.

For information, contact:

Washington State Department of Ecology
Southwest Regional Office
Olympia, WA
Telephone: (360) 407-6300

Forest-Clearing Practices

Clark County Department of Community Development

Forest-clearing activities in Clark County that are categorized as Class IV - General Forest Practices require stormwater control and erosion control plans as part of permit applications. The Clark County Department of Community Development will review the plans and may offer information on effective BMP strategies to include in the plans. This section reviews the permit applications, so its advice on stormwater BMPs can assist in the preparation of successful applications.

For information, contact:

Clark County Department of Community Development
1300 Franklin Street
P.O. Box 9810
Vancouver, WA 98666-9810
Telephone: (360) 397-2375

Washington State Department of Natural Resources

The Washington State Department of Natural Resources (DNR) has jurisdiction over forest timber harvesting and other land-clearing activities, and must be consulted to determine if a Forest Practice Permit is required for proposed forest practice activities. In addition to its regulatory role, the DNR provides professional forest management assistance to landowners. For properties greater than 10 acres, the DNR offers individual site consultations through a stewardship forestry program.

For information, contact:

Washington State Department of Natural Resources
Southwest Region
P.O. Box 280
Castle Rock, WA 98611-0280
Telephone: 800-527-3305

Automotive Industry

Auto Industry Guides to Managing Hazardous Wastes

Ecology has published eight guides for the automotive industry describing ways to manage hazardous wastes. These are small individual guide books for the following auto service areas: radiator shops, transmission shops, automotive machine shops, automotive repair shops, service stations, auto dealers, tire dealers, and auto body shops.

To obtain a guide, contact:

Washington State Department of Ecology
Publications Distribution Office
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472

Order by title and publication number. Publication numbers run 92-BR-9 to 92-BR-16, respective to the order of the service areas listed above.

Vehicle Recycling Facilities

Ecology has prepared a guidance document to assist vehicle recyclers in selecting BMPs. The title is “Best Management Practices to Prevent Stormwater Pollution at Vehicle Recycler Facilities.”

To obtain the document, contact:

Washington State Department of Ecology
Publications Distribution Office
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472
Order by title and publication number 94-146

Also refer to the Hazardous Waste Management Section on Page 5

Scrap Metal Industry Practices

Scrap Metal Recycling Environmental Guidance Manual

Pacific Iron and Metal has developed a guidance manual for metal recyclers that suggests effective stormwater BMPs applicable in the metal recycling industry. The guidance manual has been reviewed extensively by several interested agencies and organizations in the Northwest, and it addresses regulatory issues in detail. The manual includes lists of pollutants associated with various types of recyclable materials that are likely to be encountered at typical metal recycling businesses. The guidance manual also offers suggestions for recyclers seeking the assistance of an environmental consultant.

For information on the guidance manual, contact:
Pacific Iron and Metal
Telephone: (206) 628-6222, ext. 3

Labor and Technical Support

Washington Conservation Corps

The Washington Conservation Corps is a group of citizens, ages 18-25, who can offer free assistance on environmental cleanup projects such as stream restoration. The Conservation Corps is overseen by a supervisory board of representatives from the state departments of Ecology, Wildlife, and Natural Resources. The Conservation Corps' efforts are not intended for private sites, but the group may offer assistance in cooperative efforts by several businesses or residences to implement larger-scale BMPs that will benefit particularly sensitive water resources. A formal request for Conservation Corps assistance must be made by Ecology, the Department of Wildlife, or the Department of Natural Resources. Consequently, outside requests for services must be directed to one of these agencies.

For information, contact:
Washington Conservation Corps
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6000

Service Corps of Retired Executives (SCORE)

1933 Fort Vancouver Way
Vancouver, WA 98663
Telephone: (360) 699-1079

WSU Small Business Development Center

WSU/SBDC
12000 NE 95th Street, Suite #504
Vancouver, WA 98682
Telephone: (360) 260-6372

Pacific Northwest Pollution Prevention Resource Center

The Pacific Northwest Pollution Prevention Resource Center is a nonprofit organization that is a source of high-quality, unbiased pollution prevention information. The Pacific Northwest

Pollution Prevention Resource Center works collaboratively with business, government, and other sectors to promote environmental protection through pollution prevention. The Pacific Northwest Pollution Prevention Resource Center facilitates information exchange and promotes pollution prevention projects.

For more information, contact:

Pacific Northwest Pollution Prevention Resource Center
1402 Third Avenue, Suite 1420
Seattle, WA 98101
Telephone: (206) 352-2050
E-mail: office@pprc.org
Internet: <http://www.pprc.org>

Financial Assistance

Financial assistance opportunities are limited for businesses looking to implement water quality BMPs. Washington State's constitution prohibits state money from being used to fund activities of a business. In addition, many nonprofit agencies are restricted in whom they can financially assist. There are, however, some sources of funding assistance available to private businesses in Clark County. This section of the Reference Guide identifies potential sources of financial aid to assist businesses in researching, developing, and implementing water quality BMPs.

Cascadia Revolving Fund Project

The Cascadia Revolving Fund Project is a community development financial institution committed to bringing jobs and increased assets to distressed communities and low income individuals throughout Washington and Oregon. Cascadia provides loans and technical assistance (i.e., accounting, marketing, or legal assistance) to entrepreneurs, giving preference to low-income women and minorities. Cascadia also lends to businesses located in distressed communities, businesses engaged in environmental preservation or restoration, and businesses creating jobs for low income people.

For information, contact:

Cascadia Revolving Fund Project
208 Columbia Street
Seattle, WA 98104
Telephone: (206) 292-0401 ext. 113
Website: www.cascadiafundproject.org

Local Conservation Districts

The Washington State Conservation Commission administers programs through local Conservation Districts in which landowners can receive funding assistance. The grants fund up to 50 percent of costs for implementation of BMPs designed to improve water quality. In order to participate in these programs, landowners must work with the local Conservation District to develop project ideas within the context of the District's goals and funding ability.

For information, contact:

Clark County Conservation District
11104 NE 149th Street, Building C-400
Brush Prairie, WA 98606
Telephone: (360) 883-1987, ext. 5
E-mail Address: lisa-bucy@wa.nacdnet.org

Small Business Administration Loan Co-Sign Program

The Small Business Administration Loan Co-Sign Program assists small businesses in getting loans through traditional sources by co-signing notes. The Small Business Administration will co-sign loans for implementing general environmental improvement measures, as well as specific capital improvement projects. A small business must fill out the appropriate Small Business Administration loan form, then obtain the loan from its own private lender.

For information, contact:

Small Business Administration
Portland District Office
601 SW Second Avenue, Suite 950
Portland, OR 97204-3192
E-mail Address: www.sba.gov
Telephone: (503) 326-2682

Individual Banks

Often, the best source of information regarding funding options for source-control and treatment BMPs is a business' own bank. A bank where a business has an established financial history can provide specific information and funding suggestions that are tailored to the needs and circumstances of that particular business. A call to the bank or lending institution may save a significant amount of time for a business looking for funding opportunities.