

April 11, 1995

Introduced By: Nickels

bmpmot/jl

Proposed No.: 95-198

MOTION NO. 9547

A MOTION requesting the director of the department of public works to adopt by rule the King County Stormwater Pollution Control Manual and to produce, as necessary, educational materials for residential pollution prevention.

WHEREAS, the county values its water resources and has strongly supported efforts to protect them from flooding, habitat degradation, and pollution, and

WHEREAS, the county is required by the federal government to comply with the Clean Water Act's national pollutant discharge elimination system (NPDES) stormwater permit program to improve the quality of its waters, and

WHEREAS, the county is required by the state government to comply with the Puget Sound Water Quality Management Plan's (PSWQMP) stormwater program to improve the quality of its waters, and

WHEREAS, the county in so complying with NPDES and PSWQMP must control polluting discharges which enter the county-owned municipal storm sewer system, and

WHEREAS, the most effective and efficient method of controlling such discharges is working with businesses and public facilities to implement best management

1 practices, and educating residents on appropriate
2 pollution prevention activities around the home, and

3 WHEREAS, King County Code 9.12 provides the
4 authority to control polluting discharges and mandates
5 the development of a best management practices manual,
6 and

7 WHEREAS, King County Code 9.12 requests that the
8 county council make a final determination of the
9 application of best management practices to single
10 family residential activities, and

11 WHEREAS, the proposed King County Stormwater
12 Pollution Control Manual clearly and effectively
13 describes the required best management practices and
14 sources of assistance;

1 NOW, THEREFORE, BE IT MOVED by the Council of King
2 County:

3 The director of the department of public works is
4 hereby requested to: 1) adopt by rule, pursuant to
5 K.C.C. 2.98, the King County Stormwater Pollution
6 Control Manual, in substantially the form as shown in
7 Attachment A, as a document which will list required
8 best management practices for non-residential activities
9 and provide information on implementation and
10 assistance; 2) produce, as necessary, educational
11 materials for single family residential activities on
12 methods of preventing water pollution at home, such as
13 those shown in Attachment B; and 3) provide to the
14 council performance reports on implementation of the
15 manual, as contained in annual reports for King County's
16 National Pollution Discharge Elimination System
17 Municipal Stormwater Permit.

18 PASSED by a vote of 12 to 0 this 24th day of
19 April, 1995.

20 KING COUNTY COUNCIL
21 KING COUNTY, WASHINGTON

22 Kent Pullen
23 Chair

24 ATTEST:

25 Gerald A. Peterson
26 Clerk of the Council

27 Attachments:

28 A. Draft King County Stormwater Pollution Control Manual
29 B. Draft Residential Guide-Practices for Water Quality
30 Protection

31
32 Council amended 4/24/95
33 clerk

Stormwater Pollution Control Manual

**Best Management Practices
for Businesses**

Draft January 1995

Prepared by:
King County Surface Water Management
Sandra Kilroy, Project Manager
with assistance from
Herrera Environmental Consultants
Resource Planning Associates
R.W. Beck and Associates



**King County
Surface Water
Management**

Everyone lives downstream

FOREWORD

The King County Stormwater Pollution Control Manual is a product of a two and a half year process to comply with requirements of the Federal Clean Water Act-National Pollutant Discharge Elimination System Program and the State Puget Sound Water Quality Management Plan--Stormwater Program. The intent of these programs 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 non-residential entities in unincorporated King County on the actions we are all required to take to reduce the contamination of stormwater, surface water, and groundwater.

ACKNOWLEDGEMENTS

Many, many thanks are due to the dozens of people who contributed to the preparation of this manual. Numerous county staff contributed their time to reviewing the manual and I greatly appreciate their expertise, practical knowledge, and critical input. Thanks also to the staff that worked on the design and layout of the manual, especially Doug Rice.

Special thanks are due to those members of the business/citizen advisory committee who dedicated many hours of their time reviewing and commenting on the water quality ordinance (now King County Code 8.12) and this manual. The input received from this committee and other individuals in the private sector was invaluable. The committee members include:

Ilona Bray, Lynda Brothers--Puget Sound Auto Dealers Association
Jim Hammond--Puget Sound Auto Dealers Association
Hal Schlomann--Northwest Marine Trade Association
Don Davis--Master Builders Association
Lisa Verner--National Association of Industrial and Office Parks
Doug Peterson--Associated General Contractors of Washington
Gary Smith--Independent Businesses Association
Don Phelps--Auto Recyclers of Washington
Larry Pursley--Washington Trucking Association
Tim Hamilton--AUTO
Ted Slatten--Automotive Services Association
Burr Mosby--Mosby Brothers Farm
Alayne Blickle--King Conservation District
Rose Haupt, Gail White, and Linda Atkins--King County Executive Horse Council
Gene Vosberg--Restaurant Association of the State of Washington
Greg Zentner and Chantal Stevens--Muckleshoot Tribe
Mike Erb--Interstate Professional Applicators Association
Phil Fortunato--Washington State Nursery and Landscape Association
Al Vinnick--Al's Easy Livin'
Bob Roed--Bush, Roed, and Hitchings
Roy Elliot--Dames and Moore

I would also like to give special thanks to Larry Gettle, Susan Clarke-More, and Jennifer Gaus of the Surface Water Management Division for their expert knowledge and hours of relentless reading, meeting and editing.

Many thanks to you all.

Sandra Kilroy, Water Quality Planner
Project Manager

READER'S NOTE

Chapter One--Overview and Chapter Three--Best Management Practices are the most important chapters of this manual.

Chapters Two, Four, Five, and Six simply 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 ONE TO...

- 1** Determine if you are covered by this manual.
- 2** Find the step by step instructions for working through the implementation of best management practices.
- 3** Locate and complete the Activity Worksheet which identifies which of the Activity Sheets in Chapter Three you should review.

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I OVERVIEW

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.

The federal Clean Water Act mandates that cities and counties control the quality of stormwater runoff.

King 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.

ABOUT THIS MANUAL

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

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 an increasing 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 King County Council passed King County Code 8.12 in November 1992.

This manual applies to those commercial, industrial, governmental, and agricultural activities in **unincorporated** King County that have the potential to contribute pollutants to stormwater runoff or directly to receiving waters (single-family residential activities are covered in a separate homeowners manual). 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, groundwater, or Puget Sound.

Many people believe that stormwater is "clean" and does not harm water quality, but contaminated stormwater can negatively affect every water body it enters.

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.

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 pollution control BMPs that are required for various business and nonresidential activities.¹

Chapter 4 provides detailed information on how to implement many BMPs.¹

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 BMPs.

¹This manual works in a modular format so that businesses only receive the information that is pertinent to their site. Therefore the activity sheets to be located in Chapters Three and Four must be obtained by request. The options for obtaining these sheets is described later in this chapter.

BEST MANAGEMENT PRACTICES... WHAT ARE THEY?

The methods of improving stormwater quality, and thus surface water and groundwaters, are called best management practices (BMPs).

The goal of King 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.

This manual applies to all businesses and other non-residential entities in unincorporated King County.

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.

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 contacting 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 King 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.

MANUAL COVERAGE

This manual applies to *all* businesses and other non-residential entities in unincorporated King 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 King County Surface Water Design Manual.

EXEMPTIONS

If you are already implementing BMPs according to another federal, state, or local 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:*

- Have obtained and are complying with a general or individual permit under the National Pollutant Discharge Elimination System (NPDES) Stormwater Permit Program. See regulatory requirement R.12 in Chapter 6 of this manual for details of this program.
- Are implementing and maintaining a farm management plan approved by the King Conservation District.
- Are implementing BMPs in compliance with King County Code 21A.30, which addresses animal and livestock keeping practices.
- 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 voluntarily implementing other BMPs, which are equivalent measures, methods, or practices to the BMPs in this manual (contact the SWM Division to determine equivalency).

Everyone must implement BMPs, but how each individual goes about it, and through what program, may differ from one situation to the next.

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.

STEP-BY-STEP APPROACH

The following is a step-by-step approach to comply with the BMP requirements.

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 an activity you do 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 this manual. If you do not have these activity sheets, there are three options for obtaining them:

1. Visit your local King County Public Library to find a copy of the *King County Stormwater Pollution Control Manual*. Photocopy the appropriate pages.
2. Mail a photocopy of your completed work sheet, with your name and address to: *King County Surface Water Management Division, Drainage Investigation and Regulation Unit, Water Quality Engineer, 700 Fifth Avenue, Suite 2200, Seattle,*

Call the King County Surface Water Management Division at 296-1900. We will mail you the activity sheets you request.

Washington 98104. We will mail you the appropriate activity sheets.

3. Call the King County Surface Water Management Division at 296-1900. We will mail you the activity sheets you request.

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 blocking the flow of stormwater 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 Surface Water Management Division. Water quality engineers 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: 296-1900.

*To request an on-site consultation
contact: 296-1900.*

You must correct illicit discharges. If you have any question as to whether your discharge is allowable, contact the King County Surface Water Management Division, Water Quality Engineers at 296-1900.

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.

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

A common situation that can cause severe stormwater pollution problems is discharge of non-stormwater 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 onsite 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 King County Surface Water Management Division, Water Quality Engineers at 296-1900.

For information on how to check for illicit connections see BMP Info 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 either removed, permanently plugged, or connected to the sanitary sewer, septic system, onsite 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 King County Surface Water Management Division. 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 Non-structural Source-Control BMPs

First, implement the non-structural operational BMPs that typically do not require extensive construction. Examples in-

clude 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 *King County Surface Water Design Manual* must be followed in designing and receiving approval of treatment BMPs and a permit may need to be obtained from the County. Once your BMP design has been approved by the County and a permit issued (if necessary), construction may begin.

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.

Step 14 - Evaluate Your BMPs

After a year or two, take some time to evaluate your BMPs

Keep copies of your completed work sheet, the activity sheets, and other documentation on implementing BMPs.

Make sure employees are carrying out operational-type BMPs.

As new employees join your company or agency, make sure to involve them in your pollution control efforts.

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 Surface Water Management Division at 296-1900.

MEASURING COMPLIANCE

Compliance with the manual means implementing the required Best Management Practices (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 SWM Division's free on-site consultation service for assistance in evaluating your site and implementing the 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 King County Surface Water Management Division for approval.

If you are implementing the minimum BMPs and there are still significant contaminated discharges from your site, a County engineer will ask you to address those discharges even though you are doing the minimum BMPs. Similarly, if at one time you implemented BMPs but have not maintained them and they are

The intent of the County code and the BMPs is to reduce the discharge of contaminants in the most efficient and least costly way.

It is important to spend time evaluating your property and your activities before simply implementing the minimum requirements.

not working, a County engineer will request additional action. This action will be decided in 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 Surface Water Management Division at 296-1900.

IMPLEMENTATION SCHEDULE

There are mandated deadlines to implement the BMPs. These deadlines are phased, requiring the least costly measures to be implemented first and allowing a longer period of time to implement the more complex and/or more expensive BMPs.

◆ **Date BMP Manual Becomes Effective**
XX 1995

◆ **6 months from Effective Date of Manual**

Implement the Non-structural Source-Control BMPs

These include stocking spill-control and cleanup materials and training employees to use drip pans and drop cloths; sweeping instead of hosing; switching to less toxic alternatives or not using toxic chemicals; training employees to inspect storage areas for leaks; and providing small containment areas for used oil, chemicals, etc.

◆ **12 months from Effective Date of Manual**

Implement the Structural Source-Control BMPs

These include changes to your property that require a building permit such as a small building.

◆ **18 months from Effective Date of Manual**

Have a Plan/Design for a Treatment BMP (if necessary)

This means having the plans and design for a proposed treatment BMP, and submitting them for approval.

◆ **Within 12 months after plan approval**

Finish Construction of Treatment BMP (if necessary)

This means having the treatment BMP installed and functioning.

BMPs which require a building permit may take longer to implement than the above schedule allows. People will not be held liable for noncompliance for delays associated with obtaining a building permit. The Surface Water Management Division also recognizes that some organizations will have more requirements to meet than others. The SWM Division will be looking for evidence that a person/organization is actively pursuing compliance, meaning a good faith effort to implement the BMPs. This may mean implementing the nonstructural BMPs according to the schedule, showing progress in providing required information, and actively planning for completion of more costly ones. A detailed schedule of expected implementation will inform the SWM Division of your effort toward gaining compliance.

ACTIVITY WORKSHEET

Activity Sheet Number	Use this worksheet to identify the activities that you conduct. Interpret the categories broadly. Numbers A.1-38 correspond to sheets located in Chapter 3	Do you conduct this activity? If so, where?	
	TYPE OF ACTIVITY	INDOORS	OUTDOORS
STORAGE			
A.1	Required BMP's 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.	Storage of Pesticides and Fertilizers * this includes non-liquid 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 non-liquid 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		
WASHING			
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, mobile fuel trucks, 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		
PRODUCTION AND APPLICATION			
A.19	Concrete and Asphalt Production at Stationary Sites		

ACTIVITY WORKSHEET

Activity Sheet Number	Use this worksheet to identify the activities that you conduct. Interpret the categories broadly. Numbers A.1-38 correspond to sheets located in Chapter 3	Do you conduct this activity? If so, where?	
	TYPE OF ACTIVITY	INDOORS	OUTDOORS
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), and large-scale lumber treatment operations		
A.24	Commercial Composting		
A.25	Application of Pesticides-Other than Landscaping * this includes use of algicides, fungicides, pesticides, and rodenticides		
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		
OTHER			
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.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 and Sand, Gravel, and Other Materials * this covers sand, gravel, minerals, peat, clay, rock, etc. but does not include excavation at construction sites		
A.38	Well and Geotechnical Drilling * this includes mechanical drilling of water wells, environmental protection and monitoring wells, and geotechnical borings		

ON - SITE STORM DRAINAGE SYSTEM WORKSHEET

INSTRUCTIONS

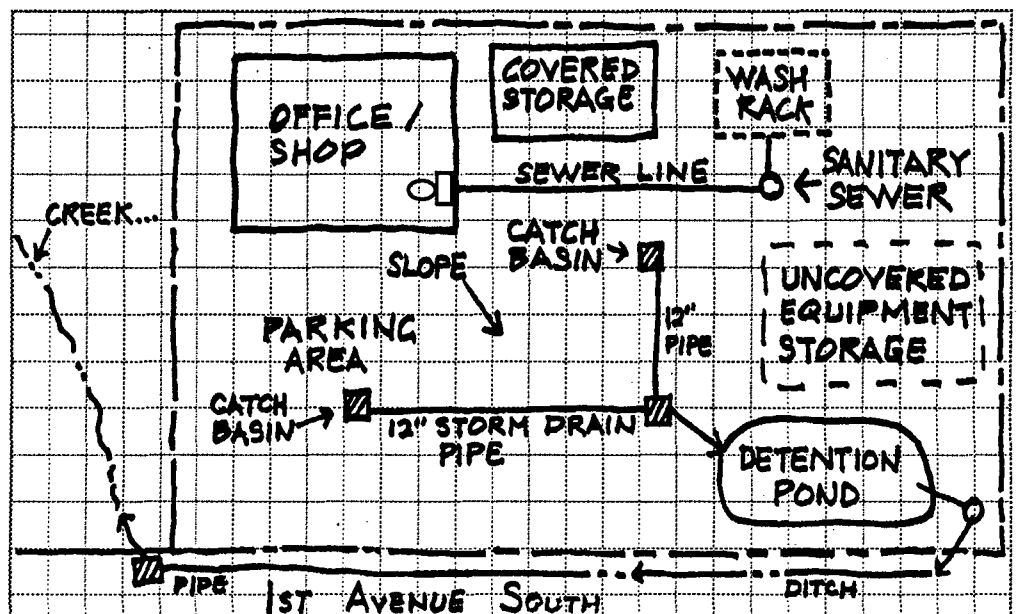
◆ If you have a set of plans/blueprints of your site and the associated storm drainage system, familiarize yourself and your employees with drainage patterns and drainage structure location.

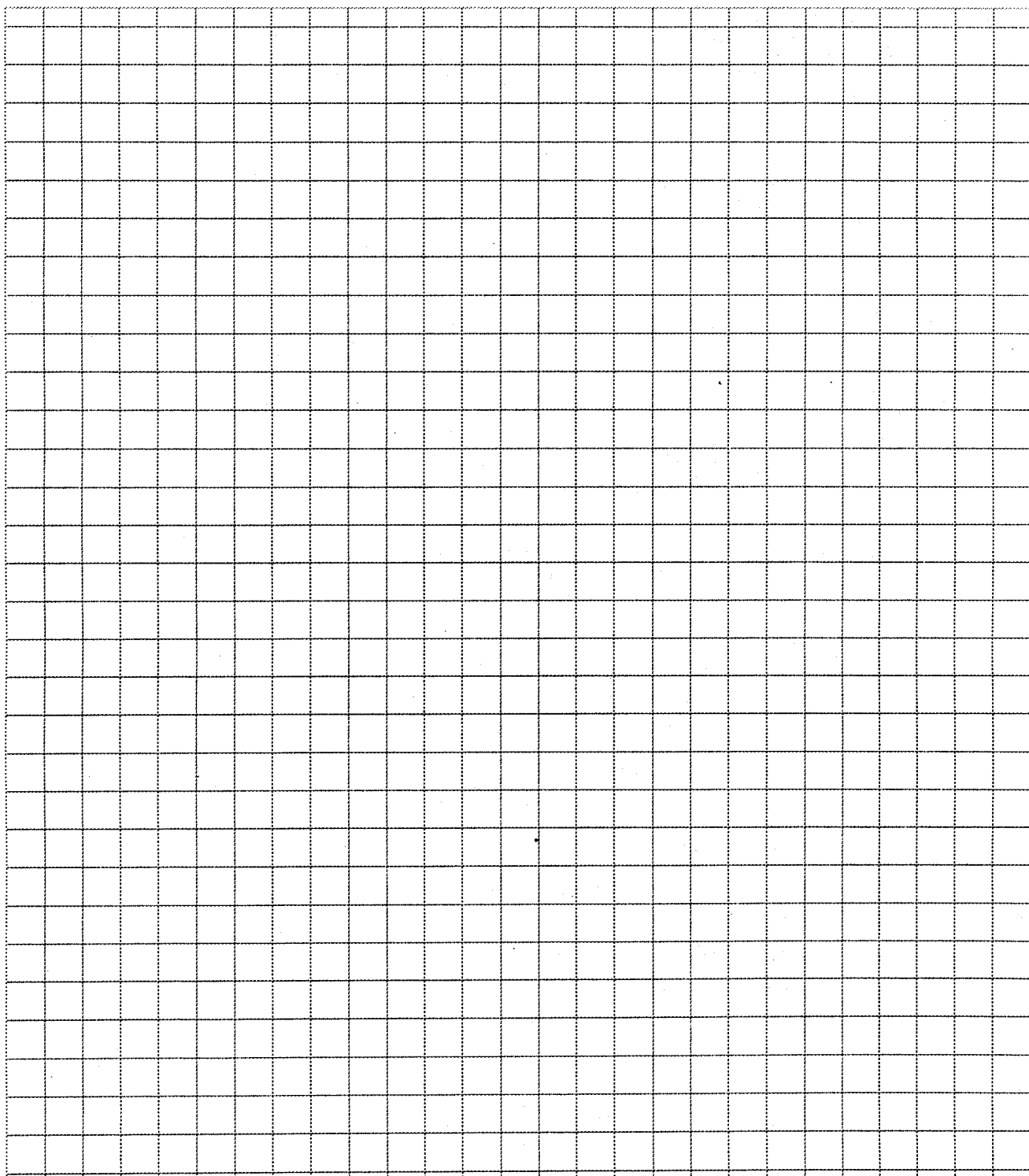
◆ If you do NOT have a set of plans, prepare a rough sketch which shows the following:

- 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: 296-1900.

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 King County Water Quality BMP 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 Surface Water Management 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: **DIR - Water Quality Investigations; Surface Water Management Division; 700 Fifth Avenue, Suite 2200; Seattle, WA 98104**

TO BE COMPLETED BY APPLICANT:

Date: _____ Applicant's name: _____

Facility name: _____ Owner name: _____

Facility address: _____

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

Specific activity under consideration for BMP:

What the Manual requires:

Why this will not work on site or is not as desirable:

Describe the alternative BMP:

Explain why this alternative may work:

Constraints or limitations of this alternative BMP (application or seasonal limitations, environmental constraints):

Other comments:

Please do not write below this line.

TO BE COMPLETED BY COUNTY:

- Approved Approved with Conditions Denied

Date: _____

Signature: _____

Title: _____

STORMWATER PROBLEMS: YOUR ROLE

Stormwater runoff although starting as rain, collects pollutants when it hits the ground and travels.

The storm drainage system collects storm water runoff and carries it to the nearest wetland, lake, stream, or to Puget Sound.

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

STORMWATER RUNOFF

In vegetated areas such as forests, fields and wetlands rain water 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 King County's lakes, wetlands, and streams. 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.

STORM DRAINS LEAD TO LAKES AND STREAMS

Storm drainage systems are designed to decrease the chance of flooding in areas that have been developed with homes, businesses and roads. The rain water that used to seep into vegetated areas now must be collected and carried elsewhere. The storm drainage system collects this storm water runoff and carries it to the nearest wetland, lake, stream, or to Puget Sound. In urban areas the storm drainage system consists 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 directly into a lake or stream.

Keeping pollutants out of the water isn't just a good idea —it's the law.

The sanitary sewer system is different. Sanitary sewer drains lead to the sanitary sewer system and end up at a wastewater treatment plant. This system carries 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 King County Code (KCC 8.12) prohibit the discharge of pollutants to the storm drainage system, surface water and groundwater. Direct dumping of material or polluted stormwater can negatively affect every water body it enters. Pollution can cause: algal blooms that cause taste and odor problems and impaired recreation and aesthetics; lesions and tumors in fish and other animals; destruction of fish spawning areas and other habitat for plants and animals; decrease in fishing, swimming, and boating opportunities.

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:

It is important to keep a clean work site and ensure that polluting material is properly handled and

- ◆ 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 land without taking steps to prevent erosion.

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.

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.

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.

Oils 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).

No type of oil or grease belongs in surface water.

Metals

Many heavy metals, including lead, copper, zinc and cadmium, are commonly found in urban runoff. Metals in solid form settle in surface 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

Dissolved metals can also contaminate drinking water supplies.

Sediment may seem harmless enough, but excess sediment concentrations turn stream and lake water cloudy, making it less suitable for recreation, fish life, and plant growth.

severely reduced, and fish inhabiting such metal-contaminated locations often exhibit lesions and tumors. Dissolved 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.

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 over-stimulate 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.

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 taste and odors problems in drinking waters, foul-smelling odor 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. Nitrogen in its ammonium form can affect surface water quality as it transforms into nitrate and nitrite in a process called "nitrification." 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 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 storm, can result in toxic pesticide chemicals being carried from agricultural lands, construction sites, parks, golf courses, and residen-

Excess nutrient levels can over-stimulate the growth of algae and other aquatic plants, resulting in unpleasant odors, unsightly surface scums, and lowered dissolved oxygen levels from plant decay.

Excessive application of insecticides, herbicides, fungicides, and rodenticides, can result in toxic pesticide chemicals being carried...to receiving waters.

tial lawns to receiving waters. Many pesticide compounds are extremely toxic to aquatic organisms and can cause fish kills.

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 can be a problem for treatment of drinking water and can limit recreational use of a water body. Bacterial contamination has led to closures of numerous shellfish harvesting areas in Puget Sound.

Animal waste, failing septic systems, and fertilizers can contribute fecal coliform bacteria.

pH

The pH value of water is an indication of its relative acidity. The pH value can range from 0 to 14, with a range of 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 contribute to change of pH in runoff, including 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.

References

Information in this chapter from: *Water Quality Protection for Bellevue Businesses*. City of Bellevue. October 1993.

BMP ACTIVITY SHEETS

This chapter consists of a series of information sheets listing the best management practices (BMP's) required for various activities conducted in unincorporated King County.

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 BMP's that should always be considered in the effort to control pollution.

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 recognize the wide variety of site conditions that may be encountered.

This chapter is designed so that businesses only receive the information that is pertinent to their site. Therefore the activity sheets to be placed in this chapter must be obtained by request after completing the worksheet in chapter one. The options for obtaining these sheets is described in the step-by-step approach in chapter one.

Please note that you are responsible for your own activities as well as those activities and services rendered by a vendor you hire. Before hiring a vendor, ensure that they follow best management practices and comply with all federal, state, and local laws.

OPTIONAL BMP's

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. The Seattle-King County Department of Public Health's Business Waste Line 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 created and existing vegetation 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 King County Solid Waste Division's Business Recycling Program and the Seattle-King County Department of Public Health's Industrial Materials Exchange 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 and other catch basin inserts that control pollutants in the piped system and as well as numerous biological 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.

Required BMP's For All Activities

MINIMUM REQUIREMENTS

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

1

Clean Your Storm Drainage System.

Clean your storm drainage system features such as storm drains, gutters, catch basins, and conveyance ditches to prevent the transport of pollutants into receiving waters. Routine maintenance procedures at all sites must include cleaning of storm drainage features, without using water to flush sediments and debris downstream of the site.

☞ *See BMP Info 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 such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

☞ *Contact the King County Surface Water Management Division at 296-6519 for information on obtaining stenciling kits, and for information on the types of nontoxic, biodegradable paints that should be used.*

3

Eliminate Illicit Connections to the Storm Drainage System.

A common situation that can cause severe stormwater pollution problems is discharge of non-stormwater 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 King County Surface Water Management Division, Water Quality Engineers at 296-1900.

☛ *See BMP Info 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.*

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Storage of Liquid Materials in Stationary Tanks

This activity applies to you if you are engaged in above-ground storage of large quantities of liquid chemicals or petroleum products in stationary tanks. This activity does not include underground 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. Storage of reactive, combustible, or flammable liquids must comply with the fire code requirements and may need to comply with other U.S. Environmental Protection Agency and Washington State Department of Ecology regulations concerning spill control and prevention plans. See Chapter 5 for details on other agency regulations.

MINIMUM REQUIREMENTS

The following BMPs, or equivalent measures, methods, or practices, are required of you 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, be washed, or fall into the storm drainage system, surface waters, or groundwater.

☞ See BMP Info Sheet 5 in Chapter 4 for information on containment. Spill containment for some materials is already required by the fire code.

- 2 Routine maintenance:

- 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, *do not 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.

See BMP Info Sheet 2 in Chapter 4 for information on disposal options.

For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 these liquids, or overtopping of storage containers, 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 the Washington State Department of 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 other U.S. Environmental Protection Agency and Washington State Department of Ecology regulations concerning spill control and prevention plans. See Chapter 5 for details on other agency regulations.


MINIMUM REQUIREMENTS

The following BMPs, or equivalent measures, methods, or practices, are required of you 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 clearance of roof covers over containers used to store flammable materials.
- 3** Raise the containers off the ground by use of pallet or similar method

OR

berm the area where the containers are stored to prevent stormwater from running into the covered storage area.

 See BMP Info Sheet 5 in Chapter 4 for berm options.

- 4** Place drip pans or equivalent absorbent materials beneath all mounted container taps, and also at all potential drip and spill

locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be re used/recycled or properly disposed.

☛ See BMP Info Sheet 2 in Chapter 4 for information on disposal options.

5

Routine maintenance:

- 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, do not 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 ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal 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 Info Sheet 2 in Chapter 4 for information on disposal options.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 due to wind or precipitation and contribute suspended solids, nutrients, heavy metals, and abnormal pH to stormwater runoff. For the purposes of the BMP requirements discussed below, **stockpiles are defined as having more than 5 cubic yards of material on a normal basis** (granted that stockpiles of less than 5 cubic yards are not in a location where they could erode into the storm drainage system).

MINIMUM REQUIREMENTS

The following BMPs, or equivalent measures, methods, or practices, are required of you if you are engaged in storage or stockpiling of erodible raw materials:

1

Cover and berm 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.

☞ See *BMP Info Sheet 3 in Chapter 4* for information on covering options. See

☞ *BMP Info Sheet 5 in Chapter 4* for information on berm options.

2

Routine maintenance:

- Sweep paved storage areas monthly for collection and disposal of loose solid materials, do not 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.

For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900.



Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Storage of Pesticides and Fertilizers

This activity applies to you if you store non-liquid pesticides or fertilizers. 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.

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 Info 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
OR
berm the area where the materials are stored to prevent stormwater from running into the area.
 See BMP Info Sheet 5 in Chapter 4 for information on berm options.
- 3 Routine maintenance:
 - 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, do not hose down the area to a storm drain or conveyance ditch.

For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900.



Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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. The Washington State Department of Ecology regulates businesses engaged in this activity. In addition, a permit from the Puget Sound Air Pollution Control Agency is required if the treatment method for removing soil contaminants involves forcing air through, or sucking air from, the soil. The BMPs recommended here 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** Contain the storage area for contaminated soils to prevent stormwater from entering the storage area and carrying pollutants away.
 See BMP Info 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, do not hose down the area to a storm drain or conveyance ditch.
 See BMP Info 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.

**For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900.**

**Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to
prevent discharges to the storm drainage system you will be asked to take additional
measures to correct the continued pollution discharges.**

Storage or Processing of Food Items

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 of all businesses engaged in **STORAGE** of fruits or vegetables:

- 1 Minimize use of water to clean fruits and vegetables to avoid excessive runoff.
- 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 of all businesses 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 Info Sheet 2 in Chapter 4 and R.7 in Chapter 5 for information on sanitary sewer regulations.

For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900.



Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Storage of Solid Waste and Food Wastes

This activity applies to you if you store solid wastes including both food and non-food wastes outdoors. This typically refers to garbage dumpsters, other outdoor waste containers, and any stockpiled garbage. Improper storage of non-food 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 the Washington State Department of 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 some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and run-off with a berm. The waste containers or piles must be covered except when in use.
 See BMP Info 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 Seattle-King County Department of Public Health discussed in Chapter 5 for information on acceptable containers.

- Sweep and clean the storage area monthly if it is paved, do not hose 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 requirements. See the discussion on health department regulations in Chapter 5 for more information.
- ☛ See BMP Info Sheet 2 in Chapter 4 and R.7 in Chapter 5 for information on sanitary sewer regulations.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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, polychlorinated biphenyls (PCBs), other toxic compounds, heavy metals, oils and greases, and suspended solids.

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

Designate an area to drain gasoline, engine fluids, and other contaminated liquids from scrapped items and dispose of waste properly (or preferably recycled) 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 (portland cement not asphalt) or over drip pans.

Contain the designated draining area to prevent stormwater from entering the storage area and carrying pollutants away.

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

2

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 storage area.
- 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, do not 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.

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

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Treatment, Storage, or Disposal of Dangerous Wastes

This activity applies to businesses that are permitted by the Washington State Department of 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 (TSD) site requirements are beyond the level of typical BMP application. Ecology regulates these facilities with specific requirements, which include the need for a National Pollutant Discharge Elimination System (NPDES) permit.

 *Contact the Washington State Department of Ecology at (360) 407-6000.*

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 Info 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 the Department of Ecology and go through the industrial waste water National Pollutant Discharge Elimination System permit process.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 Info 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 Info Sheet 5 in Chapter 4 for information on containment and run-on prevention.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 to 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:

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 infiltrates water, such as gravel, grass, or loose soil, it is acceptable to let the wash water infiltrate 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 do **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 Info Sheet 2 in Chapter 4 for information on disposal options.

The local sewer authority and the King County Department of

Metropolitan Services will likely have limits on the amount of wash and rinse water that 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.

2

Designated wash areas must be well marked with signs indicating where and how washing must be done.

3

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

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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. Waste water 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 waste water from this activity outdoors or to a drain connected to the storm drainage system. This point must be clear to employees. Waste water 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 Info Sheet 2 in Chapter 4 for information on disposal options.

- 2 Label equipment with a message similar to "No waste water can be discharged to a storm drain, drainage ditch, or to the ground." In addition, label equipment with the proper waste water 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 Info 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 waste water you need to worry about properly disposing.
- 2** Recycle wash water.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.


Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 as 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 National Pollutant Discharge Elimination System (NPDES) permit, administered by the Washington State Department of 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 or detergents 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 Info Sheet 2 in Chapter 4 for information on disposal options.
- 2** If soaps or detergents are not 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 as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

4

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

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.


Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Truck or Rail Loading and Unloading of Liquid Materials

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 precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip-collected materials must be disposed of properly.
 See BMP Info Sheet 2 in Chapter 4 for information on disposal options.
- 2** Employees must be trained in proper handling techniques during liquid transfers to avoid spills.
- 3** 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.

For more information or assistance in implementing the best management practices contact:
the King County Surface Water Management Division at 296-1900




Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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. It also covers mobile fueling operations. 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 precipitation cannot come in contact with the fueling area.
 See BMP Info Sheet 3 in Chapter 4 for information on covering options. An exception to this requirement is granted for mobile fueling equipment, 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 Info Sheet 5 in Chapter 4 for information on containment.
- 3** Install and maintain an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.
 See the King County Surface Water Design Manual for various designs and the BMP Info 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 custom-

ers 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.

If you can not implement the above requirements on your site, consider ceasing your on-site fueling activities and take your vehicles to a station which meets the requirements.

ADDITIONAL BMP'S

The following BMP's 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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.


Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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," "Vehicle Washing and Steam Cleaning," "Fueling Operations, and "Vehicle and Equipment Parking and Storage."

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** 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 Info Sheet 2 in Chapter 4 for information on disposal options.
- 2** If the work is done on a regular basis at a stationary business location: move the activity indoors.
- 3** **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 (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry).

Do not clean them at home or at a coin-operated laundry business).

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

ADDITIONAL BMP'S

The following BMP's 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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.



Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 Info 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 Info 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, do not hose down the area to a storm drain.

ADDITIONAL BMP'S

The following BMP's 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 Info 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 waste water 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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Concrete and Asphalt Application 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 Info 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, do not hose down the area to a storm drain.

ADDITIONAL BMPs

The following BMP's 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 filter insert may remove some of the pollutants in runoff from these activities. This is especially useful if the activity must proceed on rainy days.

☛ See BMP Info Sheet 9 in Chapter 4 for more information.

For more information or assistance in implementing the best management practices contact the King County Surface Water Management Division at 296-1900.


Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Manufacturing and Post-Processing of Metal Products

This broad activity group applies to mills, foundries, and fabricators that manufacture and/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. Waste water 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 National Pollutant Discharge Elimination System (NPDES) permit from the Washington State Department of 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 quenching, cooling, or rinsing of metal products:

- 1** Discharge process waste water from this activity to a sanitary sewer, holding tank, or process treatment system.
 See BMP Info 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, do not hose down the area to a storm drain.

ADDITIONAL BMPs

The following BMP's are not required but they can provide improved pollution control.

1

Cover the activity area(s) to prevent precipitation from contacting the area, and to reduce the amount of runoff that has to be detained or treated.

☞ See BMP Info Sheet 3 in Chapter 4 for information on covering options.

2

Use a catch basin filter insert to capture stray metal particles in runoff.

See BMP Info Sheet 9 in Chapter 4 for information on inserts.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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." BMPs for painting and finishing of boats and other marine objects are described under "Boat Building, Maintenance and Repair." BMPs for storage of paints and materials are described under "Storage of Liquid Materials in Portable Containers." 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 Move the activity indoors with appropriate fire protection provisions.

OR

Erect heavy tarps or plastic sheets in a manner (like a spray booth) that surrounds the objects to be worked on so wind-blown spray can be contained.

☛ See Chapter 5 for details on Puget Sound Air Pollution Control Agency (PSAPCA) requirements, and also for fire code implications.

2 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 over spray.

- 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, do not hose down the area to a storm drain.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 National Pollutant Discharge Elimination System (NPDES) permit, administered by the Washington State Department of 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 Activity Sheet A-3 "Storage of Liquid Materials in Portable Containers."

In addition, the following BMPs are required for large-scale commercial operations:

- 3 Hold dipped lumber over dip tanks until dripping ceases (if applicable).

4 Store treated lumber in a covered and paved area for at least 24 hours following treatment (longer during cold periods) so that precipitation 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.

5 Contain the wood treatment equipment and work areas to prevent stormwater from entering the area and carrying pollutants away.

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

6 Routine maintenance:

- Cover outdoor dip tanks when not in use.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Commercial Composting

This activity applies to you if you are engaged in receiving and composting wastes as a commercial service. This typically refers to businesses which have numerous compost piles that require large open areas to break down wastes. Composting can contribute nutrients, coliform bacteria, and suspended solids to stormwater runoff. All commercial composting operations must satisfy Seattle-King County Health Department requirements. See Chapter 5 for a summary of Health Department regulations for solid waste. 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 Locate composting areas on impervious surfaces (King County Health Code, Section 10.48.030)
- 3 Drain all runoff from composting operations to a sanitary sewer, holding tank, or on-site treatment system.
See BMP Info 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.
- 4 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 Info Sheet 5 in Chapter 4 for information on containment. See the King County Health Code for full compliance.*

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Application of Pesticides - Other Than Landscaping

This activity applies to you if you use pesticides for such purposes as removing moss from rooftops, killing nuisance rodents, and using 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 Seattle-King County Department of Public Health pesticide regulations. See 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."


MINIMUM REQUIREMENTS

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

1. Use proper application practices to avoid excessive application and poor timing with precipitation events. Manufacturers' application guidelines must always be followed. Pesticides must never be applied if precipitation is occurring.
2. Use the smallest amount of pesticides necessary to accomplish the job.

ADDITIONAL BMPs

The following BMP's 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 which 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 Info 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 pesticide application that can accomplish the job.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 Golf Course BMP Manual (see Chapter 6 of this manual for more information). The BMPs listed below are intended to complement other regulatory requirements. See related Activity Sheets for "Storage of Pesticides and Fertilizers" and "Storage of Liquid Materials in Portable Containers."

MINIMUM REQUIREMENTS

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

- 1 Do not apply herbicide, insecticide, and fungicide within 100 feet of surface waters such as lakes, ponds, wetlands, and streams. (This buffer distance is specified in the Department of Ecology's Stormwater Management Manual). All applications must follow manufacturers' recommendations. Pesticides must never be applied if precipitation is occurring.
- 2 Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, by composting, or by burning (where allowed). Do not dispose of collected vegetation into waterways or storm drainage systems.
- 3 Cover areas where soils are temporarily stripped bare for more than two weeks with mulch or other erosion control material, or seed with temporary vegetation.
- 4 Avoid planting Noxious Plant Species or Species of County Concern, particularly near lakes, wetlands, and riparian areas. Contact the King County Cooperative Extension Service for

information on these types of plants.

5

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 employees about modifying their landscaping practices to prevent stormwater pollution and the specific details of the BMPs.

ADDITIONAL BMPs

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

1

Integrated pest management (IPM), a comprehensive approach to the use of pesticides which minimizes pesticide application and stresses biological controls, selection of proper products, and tailored application rates, is the most effective BMP measure that can be taken for herbicide, insecticide, and fungicide use. IPM also includes concepts such as selection of disease-resistant plants and routine maintenance of vegetation to keep it pest and disease resistant.

☛ See BMP Info Sheet 6 in Chapter 4 for information on IPM.

2

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.

3

Use mechanical methods of vegetation removal rather than applying herbicides.

4

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.

For more information or assistance in implementing the best management practices contact the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 construction sites greater than 5,000 square feet, the King County Department of Development and Environmental Services must be contacted. You may need to follow the procedures for construction site erosion and sediment control outlined in the King County Surface Water Design Manual.

Note: King County is currently in the process of assessing and coordinating the clearing, grading, and erosion control requirements. The Surface Water Design Manual will continue to have a chapter dedicated to required erosion control measures. The Design Manual is currently being revised and the scope of the manual will be expanded to address small sites. The County has decided not to include any erosion control requirements in this BMP manual. However, the county will be using the authority of K.C.C. 8.12 and this manual to develop erosion control requirements for those activities not covered by the Design Manual.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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, do not hose down the area to a storm drain.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 Application at Temporary Sites."

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 other tools that are covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can subsequently 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 Info 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.

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 precipitation events and when not in use (such as overnight). A cover would include tarps or other temporary cover material.

 (See Activity Sheet on "Storage of Liquid Materials Portable Containers.")

ADDITIONAL BMPS

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

1

Recycle materials: left over materials, paints and other finishing materials should be used on the next project or donated to others who will use them.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Boat Building, Maintenance, and Repair

This activity group applies to mobile operations, on-shore 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 National Pollutant Discharge Elimination System (NPDES) permit under the Washington State Department of 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 on-shore 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 Puget Sound Air Pollution Control Agency (PSAPCA) limitations.
- 3 Use ground cloths for collection of drips and spills in painting and finishing activities.
- 4 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 Info 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.

5 Perform paint and solvent mixing, fuel mixing, and similar handling of liquids on-shore, to avoid spillage directly in surface water bodies.

6 **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, do not 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 on the water surface underneath the work area on boats or docks to collect drips, spills, and loose solids when work is performed over water. A similar measure would be to use tape to attach a tarp or sheet to a boat hull and the adjacent dock.

3 All used oil and oil filters should be recycled. Most marinas now offer used oil recycling services.

4 Biodegradable and phosphate-free soaps and detergents should be used, if any are used at all, for boat washing activities. Soaps and detergents should be used conservatively.

5 Use sanders that have dust-containment bags.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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

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 Info Sheet 2 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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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."

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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 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, not to a water body or storm drainage system, 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.
- 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 authority and the King County Department of Metropolitan Services 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 Seattle-King County Department of Public Health in this situation.

- ◆ 3 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 King County Department of Development and Environmental Services or a local building department should be contacted 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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 coliform bacteria, nutrients, and suspended solids.

MINIMUM REQUIREMENTS

The following BMPs, 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, do not hose down the area to a storm drain.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Keeping Livestock 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 due to overgrazing and stream bank trampling. The King County Code 21A.30 has specific requirements for livestock management. Therefore, there are no additional requirements for keeping livestock in stables, pens, pastures, or fields in this manual.

See Chapter 5 for a summary of the K.C.C.21A.30 requirements. Affected landowners and pasture managers should refer to the King Conservation District and the Washington State University/King County Cooperative Extension Service for information on BMPs for livestock management.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 primary concern with this logging activity in the context of stormwater pollution is the effect of timber cutting and understory clearing on erosion processes. 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 King County Sensitive Areas Ordinance has requirements for logging near streams, wetlands and other sensitive areas and the King County Surface Water Design Manual has requirements for clearing, grading of sites. Therefore, there are no additional requirements for logging in this manual.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 King County. Mining operations have the potential to introduce a variety of pollutants into runoff, including nutrients, suspended solids, abnormal pH, and metals. Precipitation can easily erode cut slope faces and stockpiled materials, readily causing stormwater contamination problems.

The Department of 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 National Pollutant Discharge Elimination System (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. The King County Department of Development and Environmental Services (DDES) also has authority to regulate mining activities under the Drainage Ordinance, with Ecology's water quality guidelines as the basis. Therefore, there are no additional requirements for mining and quarrying in this manual.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

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 receiving waters. 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 King County Department of Development and Environmental Services for 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 King County Surface Water Design Manual for information on vehicle access preparation and maintenance and erosion control measures.
- 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.

- 5 During wet weather divert any concentrated flows of water into the site using sandbags or other such check dams upslope 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, lake, or Puget Sound. 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 Activity Sheet for "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.

For more information or assistance in implementing the best management practices contact: the King County Surface Water Management Division at 296-1900.

Reader Note: The above requirements are minimum required BMPs. If these BMPs fail to prevent discharges to the storm drainage system you will be asked to take additional measures to correct the continued pollution discharges.

Best Management Practices Info Sheets

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

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

No.	TITLE
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 Constructed Wetland
13	Vegetated Biofilters
14	Sand Filter
15	Infiltration

See Chapter Five--Other Agency Requirements and Chapter Six--Technical and Financial Assistance for other useful information to assist you in implementing the best management practices on your site.

Source Control BMP's

The following BMP Info 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 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 clean up 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 King County's program is to reduce the contamination of water resources through emphasis on source control BMPs. The following BMP Info Sheets provide more detail information on how to implement some of these source control BMPs.

Illicit Connections

An illicit connection is a connection that could convey anything not composed entirely of surface and storm water directly to the storm drainage system or a water body. Many buildings throughout King County probably have illicit connections to the storm drainage system. These typically include, but are not limited to, sanitary sewer pipes, process waste water discharges, sump overflows, and internal building drains connected to the storm drainage system. As a result of illicit connections, waste water 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. King County is currently making a committed effort to determine where illicit connections are present and to require their removal.

FINDING AN ILLICIT CONNECTION

All businesses and public agencies in unincorporated King 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, side sewer cards 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 side sewer cards do not show your plumbing, the most basic method for determining a connection is dye tracing. A non-toxic 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, King County staff should be contacted for assistance in defining the storm drainage system characteristics for the site. King County Surface Water Management must be notified of a dye test at least one day in advance of testing.

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 waste water to the sanitary sewer is the required or chosen BMP, the local sewer authority and the King County Department of Metropolitan Services (METRO) must be contacted to obtain approval prior to commencement of discharges to the sanitary sewer. The local sewer authority and METRO 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. The local sewer authority and METRO will regulate the connection both for discharge quantity and quality, 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 waste water 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, the Seattle-King Department of Public Health must be contacted for further information. If a septic system is not present on the property, then one should be installed. If this is the case, the Seattle-King County Department of Public Health should be contacted for advice and information on septic system requirements. If the discharge is industrial process water or other non-domestic waste water, a holding tank or on-site treatment system will be needed. If an illicit connection needs to be rerouted to a holding tank, King County staff should be contacted for 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.

Disposal Options

Every business and public agency in King 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

Process waste water and contaminated stormwater (depending on the pollutants and associated concentrations present) can be put into the sanitary sewer, subject to approval by the local sewer authority and the King County Department of Metropolitan Services (METRO). Animal waste can be disposed of in a sanitary sewer, subject to loading capacity constraints. The King County Department of Metropolitan Services may require that all stormwater discharged 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, stormwater, or other waste water to the sanitary sewer is the required or chosen BMP, the local sewer authority and METRO must be contacted to obtain approval prior to commencement of discharges to the sanitary sewer. 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 and METRO 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, 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 Info 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 constituency 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 waste water generated. Any changes in waste volume and constituency from those present when the system was permitted must be approved by the Seattle-King County Department of Public Health. 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. There are a number of private businesses that accept materials for recycling. In addition there is an Industrial Material Exchange clearinghouse which facilitates the transfer of unwanted materials from the generator to another business that can use them.

Process waste water 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 landfill for information on materials accepted at the facilities. The Business Waste Line (see phone number in Chapter 6) can provide information on disposal of hazardous wastes.

WASTE TRANSPORTATION AND DISPOSAL SERVICES

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.

Costs of disposal 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.

The Seattle-King County Department of Public Health's Waste Characterization Program serves hazardous waste generators in Seattle and King County that have questionable wastes. Information supplied by the generator on questionable wastes such as sludges, sandblast waste, treated wood, and contaminated soils is reviewed by the Health Department. Permits are issued for those wastes that will be allowed in the garbage. The dangerous waste regulations as well as other criteria are used in the decision process.

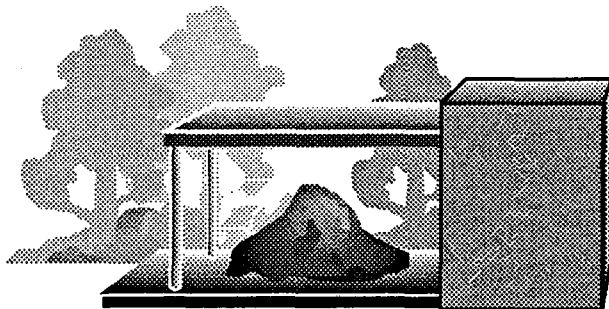
The disposal of wastes is the responsibility of the generator. Before agreeing to let a company handle your waste, it is recommended that you ask for (and check) the company's references. All waste collected by the company should be delivered to an authorized site. Make sure you keep copies of all your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

Covering Options: Roof, Awning, or Tarp

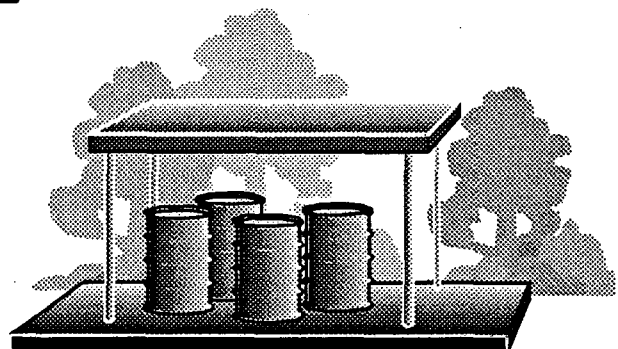
One of the most effective actions a person can take to prevent stormwater contamination is keeping potential pollutants out of the rain. There are numerous options for covering an activity. This BMP, combined with prevention of stormwater run-on into the covered area, can be as effective as indoor enclosure. Costs can be much lower for a simple overhanging roof or awning than for a new building. However, any building of structures requires a building permit. In addition, if the roof cover is greater than 400 square feet, fire code requirements apply. These regulatory requirements can, in some cases, make some of these structures too expensive to be practical. Contact the King County Department of Development and Environmental Services for information on building permits and requirements for roof covers.

The roof structure can be designed in several ways. One option, a lean-to type of structure, involves connecting one or more sheets of corrugated steel, fiberglass, aluminum or a similar inexpensive, impermeable material to the wall of a building and supporting it with sturdy poles. Similarly, if there is no building to connect the roof to, roofing materials can be sufficiently supported at all four corners as a stand-alone canopy, or a waterproof tent canopy can be used.

The area of the roof cover should be sufficient to prevent any precipitation from reaching the protected contents underneath. Examples of these types of structures are shown below.

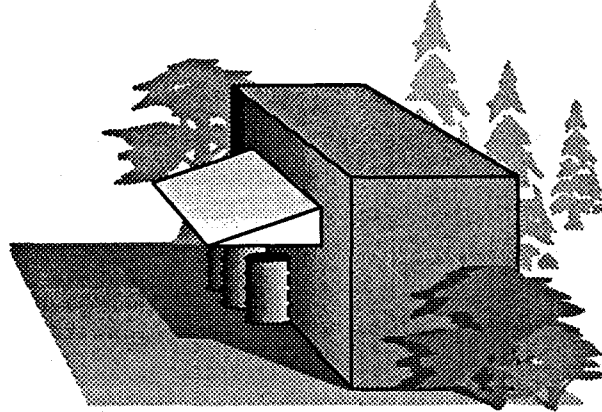


Lean-To Structure



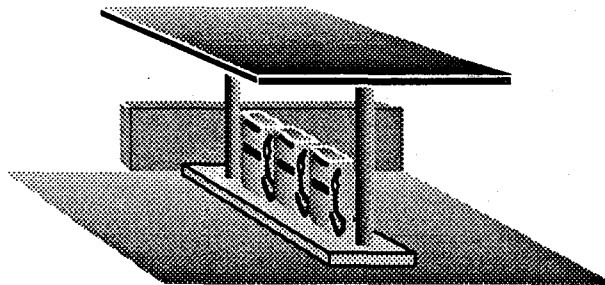
Stand-Alone Canopy

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. An example of an awning cover is shown below.



Overhanging Awning

Activities such as fueling operations may be more 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. An example of this type of roof structure is shown below.



Island-Type Overhanging Roof

Note that floating fuel stations cannot be covered, according to the fire code.

The particular roof cover option used at a given site is subject to the site layout and available space, affordability, and limitations imposed by other regulations. Structural cover options other than those given above can be implemented if they perform the same functions; such creative designing is welcome on the part of businesses or residences that wish to use this BMP, and may enable inexpensive solutions. This BMP should usually be imple-

mented in conjunction with prevention of stormwater run-on into the covered area. BMP Info Sheet 5 presents information on run-on prevention.

Some activities, such as stockpiling of raw materials, can be effectively covered with a sturdy tarp or heavy plastic sheet(s) 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 or sheet covers the activity completely and that stormwater run-on does not penetrate significantly under the cover. If several sheets are used to form a cover, the sheets should be tethered together or laid in an overlapping manner. If necessary, pins or stakes should be used to anchor the tarp(s) to the ground. The tarp(s) must be inspected weekly to ensure that no holes or gaps are present in the tarp coverage. An example of a cover arrangement such as this is shown below.



Tarp Covering

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 adjacent to buildings where winds are reduced, but not in between buildings where a wind tunnel effect occurs.

Tarps are inexpensive, and therefore are a cost-effective BMP for many activities. This BMP can be combined with runoff containment/run-on prevention curbs, dikes, and berms for better effectiveness. See BMP Info Sheet 5 for more information.

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 waste water 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 waste water 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. The local sewer authority may, in some instances, allow a connection of sump outflow to the sanitary sewer system. This is unlikely, but may be a consideration.

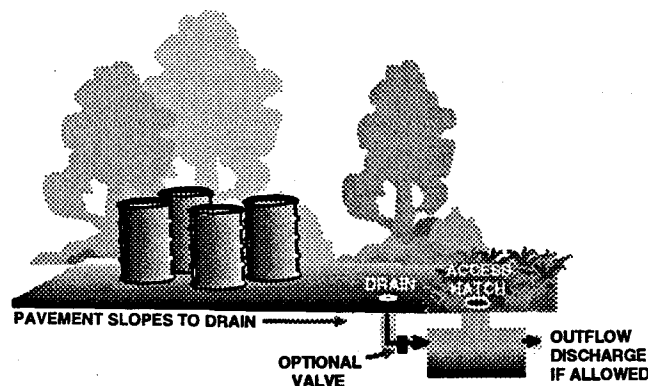
The paved activity area must also be contained to prevent stormwater run-on and run-off. This can be a curb, dike, or berm or similarly effective impediment to run-on, or intercepting storm drains (see BMP Info Sheet 5 in this chapter for more information). This way only the precipitation that falls 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 activ-

ity 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.

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 Info Sheet 2 for disposal options.

An example of a paved activity area with a sump drain is shown below.



Paved Area with Sump Drain

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 and the King County Department of Metropolitan Services 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 King County Department of Metropolitan Services industrial waste 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.

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 with sturdy knee-high boards or similar inexpensive 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. Activities that require more space and therefore cannot be contained with a tub may need to be surrounded by a curb, dike, or berm. Above ground tank storage of liquids, storage of chemicals or wastes in numerous drums, and stockpiling of fertilizer are examples of activities that can be contained effectively in this manner. As the activity area gets larger, containment with an earthen berm can probably be provided less expensively than concrete curbing.

If a curb, berm, or dike is used for runoff containment, and other containment sizing regulations (such as fire codes or Washington State Department of Ecology restrictions) do not apply, it should function so that all stormwater runoff from precipitation events up to the 6-month, 24-hour storm is contained in the immediate activity area until it infiltrates into the ground or is properly disposed of later. This approach is applicable for activities that involve liquid material storage, and that may consequently incur spills. It is also applicable to stockpile areas where runoff is typically polluted with suspended solids. If stormwater runoff 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 or into the stormwater treatment system, 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.

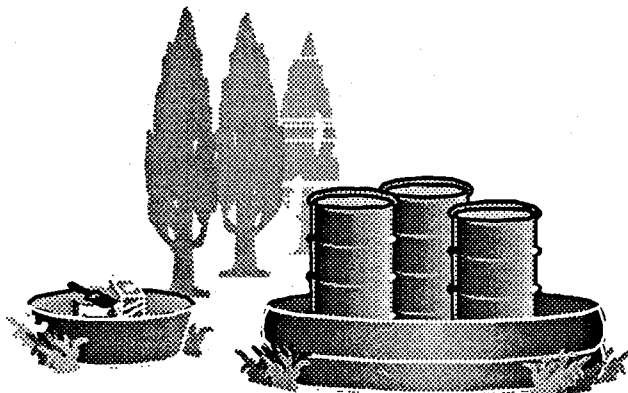
Local sewer authorities and the King County Department of Metropolitan Services will

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. Containment is a good BMP tactic in situations where activity covering cannot be accomplished.

If containment is used rather than covering, 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 up-slope 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.

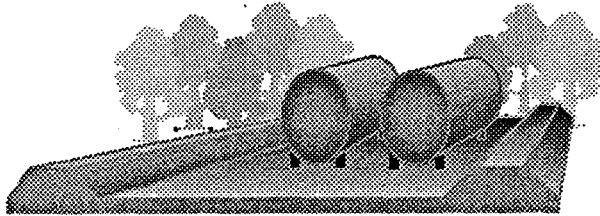
Difficulties in maintenance may arise with disposal of the captured water on sites without stormwater treatment capability (essentially, most sites). If the activity is located on impermeable ground, then potentially contaminated water will accumulate inside the containment area. If contaminated, this accumulated water cannot simply be drained from the area; it must be collected and disposed of either in a sanitary sewer 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 would be needed to determine if ponded water is contaminated. Depending on the monitoring requirements, this can also be very costly.

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 below.

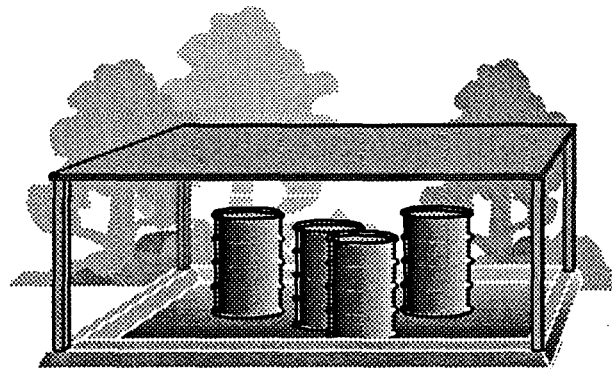


Simple Containment Devices

For larger areas, a containment curb, dike, or berm may be necessary. If an earthen berm is used, it must be seeded with grass or other vegetation so that it does not erode. Sketches of a containment dike and a containment curb are shown below.



Containment Dike



Containment Curb

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. Similar arrangements can also be constructed by hand.

Integrated Pest Management

Use of herbicides, insecticides, fungicides, and rodenticides can be extremely harmful to the environment due to 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 non-chemical 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.

Clean Catch Basins

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 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.

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 as trapped solids and stagnant, polluted water in sumps can be flushed out in large quantities with turbulent storm flow conditions.

As a rule of thumb, catch basins must be cleaned out when the solids buildup 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 drainage basin feeding into it. If activities that generate a lot of sediments are taking place in the drainage area feeding a catch basin, 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, sites with activities generating a lot of sediments and other debris will have to clean out their catch basins more often.

Several companies offer catch basin cleaning services. Pertinent equipment dealers and cleaning services can be found in your telephone directory's yellow pages under headings like "Sewer Cleaning Equipment and Supplies," "Sewer Contractors," and "Tanks Cleaning." 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 hazard-

Water Quality Treatment BMP's

The following BMP Info Sheets discuss a variety of water quality treatment facilities used to treat stormwater runoff. 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 Three, should always be considered first.

The BMP Info Sheets describe the water quality treatment facilities including the applicability, maintenance, and design considerations of each. Design and construction details are deferred to either the *King County Surface Water Design Manual* (which contains relevant information for the treatment BMPs discussed), or to a private vendor specializing in the treatment system.

Businesses and agencies are allowed to select a treatment BMP other than those presented in this manual if they follow the variance process as outlined in the *King County Surface Water Design Manual*.

Table 4.2 (next page) presents a brief description of each water quality treatment BMP discussed in the info 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 designed for a specific purpose and is capable of removing only specified pollutants. If you decide to install a water quality treatment BMP, always ensure that it is removing the pollutant of concern from your site runoff.

**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 floatables and some settleable solids.
Catch Basin Insert	A filtering device that is installed within a catch basin and uses various sorbant 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 filtering device that is installed above or below ground and uses leaf compost to remove pollutants from stormwater.
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, engineered structure that retains a permanent pool of water.
Vegetated Biofilter - 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	A structure placed in the landscape, with grass grown on top, or in vaults. Stormwater passes through the sand allowing particulate pollutants to be filtered out.
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.

**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, leaf compost filters.
Sediments/Solids Sources: sand/gravel storage, construction sites, unpaved areas, agriculture/livestock uses	<u>For coarse sediments</u> - Wet pond/vault, constructed wetland (with forebay); vegetated biofilter; sand filter; catch basin insert; catch basin sump/vault filters, leaf compost filters <u>For fine sediments</u> - Wet pond/vault, constructed wetland (with forebay); vegetated biofilter; sand filter. Also see catch basin sump/vault filters.
Phosphorus Compounds Sources: detergents/cleaners, fertilizers, organic matter, animal wastes	<u>For particulate phosphorus</u> - Wet pond/vault, constructed wetland (with forebay); vegetated biofilter; sand filter. <u>If dissolved phosphorus</u> must also be removed - a large "oversized" wet pond or sand filter.
Nitrogen Compounds Sources: fertilizers, animal wastes, organic matter	<u>For particulate nitrate</u> - Wet pond/vault, constructed wetland (with forebay); vegetated biofilter; sand filter. <u>For dissolved nitrate</u> - constructed wetland.
Metals Sources: industrial areas, vehicle and equipment areas, paints, pesticides	<u>For particulate metals</u> - Wet pond/vault, constructed wetland (with forebay); vegetated biofilter; sand filter. <u>For dissolved metals</u> - leaf compost filter or constructed wetland.
Fecal Coliform Bacteria Sources: animal wastes; fertilizers	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	<u>For particulate BOD</u> - see "particulate nitrate" above. <u>For dissolved BOD</u> - A constructed wetland will remove some dissolved BOD and trace organics; more reliable performance requires activated carbon.

Oil/Water Separator

APPLICATION AND DESCRIPTION

An oil/water separator is an underground vault designed to remove oil, grease, and similar floatable pollutants from stormwater runoff.

Oil/water separators are appropriate at locations where petroleum products and/or byproducts cannot be effectively controlled with source-control BMPs. Oil/water separators can be simple tee sections in catch basins that trap floating materials, or complex units that are 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.

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 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.

These 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.

DESIGN AND MAINTENANCE

Oil/water separators should be designed and sized in accordance with the *King County Surface Water Design 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 in accordance with current Seattle-King County Department of Public Health 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.

Catch Basin Insert

APPLICATION AND DESCRIPTION

A catch basin insert is a device installed under a storm drain grate to provide water quality treatment through filtration, settling, or absorption.

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 are able to remove dissolved pollutants and pollutants associated with fine sediments, independent tests of these systems have not confirmed this. 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.

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 a suitable for use 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: Inserts designed for sediment removal may be used at construction sites, and in situations where stockpiles or unpaved areas are likely to contribute high sediment loads. They may also be appropriate for small (low traffic) businesses in which the per-inlet cost of cleaning would be excessive. Tests indicate that these units do little to remove fine materials and dissolved pollutants and should not be considered a substitute for other pollutant-removal BMPs.

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 which the system can pass without causing flooding. This capacity is equal to the amount of water which is able to pass through the insert's treatment area, plus the amount which can pass through the built-in overflow structure. As the unit treats the stormwater, the treatment area begins to clog and the total conveyance capacity is reduced. If maintenance is neglected, or an unusually high amount of sediment or debris enter the system, the treatment capacity may drop to zero, and all of the water will have to exit through the overflow. 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 and Bypass: The treatment capacity refers to the amount of water which the unit will pass through its treatment area. The unit should be sized to ensure that most of the water entering the drain-inlet is treated even as the treatment area starts to clog. The ability of the unit to remove pollutants will be reduced 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 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.

Catch basin inserts will generally require more frequent, but less costly 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 consists of removing the unit from the catch basin, cleaning or replacing the filter media, and re-installing the unit.

In addition to the weight considerations mentioned above, you must insure 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.

Maintenance frequency will vary depending on the amount and type of pollutant targeted. Tests conducted by King 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.

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.

At this writing, 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 (in catch basin inserts, however, the filtering media is subject to the entire sediment load and tend to clog after only a few inches of rainfall. In addition, the volume available to catch basin inserts is generally limited to about two cubic feet, further limiting their ability to remove sediments and sediment-related pollutants).

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 performance information exists on sump or vault filters, the likelihood that new products will be developed, and the strong interest on the part of both government agencies and pollution-control firms, makes them worth considering. Those considering these space saving, and potentially low-cost options, should contact the Surface Water Management Division for information on the latest technology.

DESIGN AND MAINTENANCE

All of the design considerations regarding filtration capacity, overflow capacity, and media selection which were discussed in BMP Info 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.

Leaf Compost Filters

APPLICATION AND DESCRIPTION

Leaf Compost Filters are a filtering structure that is installed above or below ground and uses leaf compost 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 best used to remove moderate concentrations of particulate pollutants and oil and grease. They are particularly effective in removing metals and some organic pollutants. Leaf compost filters should NOT, however 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.

Above ground leaf compost systems can be used to treat runoff from small or large sites. As such, they are recommended for use in redevelopment projects. Below ground leaf compost filters are also well suited in urban areas where land surface constraints are important, since they require relatively little surface area of compost filter media.

DESIGN AND MAINTENANCE

Leaf compost filters should be designed, sized, and maintained in accordance with the *King County Surface Water Design Manual*. They should be located in areas that are easily accessible for routine maintenance and inspection. The filters should also have adequate maneuvering area for replacement of the compost media. Replacement usually requires the use of a backhoe for above ground filters and a vactor truck for below ground filters.

Leaf compost filters are subject to clogging by fine sediment and other debris. At a minimum the facility should be inspected every three months during the first year of operation. Based on these findings, the intervals of inspection may be reduced to every six months. In all cases, the facility shall be inspected and maintained after each significant storm event.

Wet Pond, Wet Vault, or Constructed Wetland

APPLICATION AND DESCRIPTION

A wet pond, wet vault, and constructed wetland 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. Underground detention pipes can also be converted to wet pipes (becoming a wet vault). A new wet vault is probably the most suitable system for businesses that do not have a detention facility or where the detention facility cannot be converted to treat stormwater.

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. Some dissolved pollutants are probably removed although the data are too limited to draw definitive conclusions. 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 *King County Surface Water Design*

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.

There are two general configurations of vegetated biofilters: *swale* and *strip*. A 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 although wetland vegetation is used if higher water tables or base flows are encountered. A filter strip treats sheet flow and is placed parallel to the contributing surface. Grass is the most common vegetation, 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. Heavy oil producing sources should be first treated with other oil control BMPs before runoff is directed to vegetated biofilters.

Vegetated biofilters will likely see limited application for retrofitting existing businesses. In some cases it will be possible to convert landscaped areas to biofilters. Roof drains that are currently piped directly to the storm drain could be modified to discharge to the grassed areas next to the building and then to a catch basin located in the grassed area. Some parking lots might be reconfigured so that a grass median can be placed over the existing catch basins. Given the appropriate site conditions, vegetated biofilters can complement (but seldom substitute for) source control BMPs.

DESIGN AND MAINTENANCE

These facilities are to be designed, sized and maintained in accordance with the *King County Surface Water Design Manual*.

A flow spreader at the inlet of the swale may enhance the use of the entire swale width. Bypassing flows above the peak rate of 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.

Sand Filter

APPLICATION AND DESCRIPTION

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.

DESIGN AND MAINTENANCE

The sand filter should be sized according to the *King County Surface Water Design Manual*.

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 *King County Surface Water Design Manual*.

Infiltration

APPLICATION AND DESCRIPTION

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

Infiltration systems have traditionally been used only in highly drained soils for handling excess runoff quantity. 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.

Infiltration facilities can be either ponds or vaults which 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 coarse soils to protect groundwater quality, and for finer soils to avoid 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 which 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 the *King County Surface Water Design Manual*. Porous pavement is not discussed in the *Surface Water Design Manual*, but maintenance should be to vacuum-sweep and pressure wash frequently (quarterly is suggested).

OTHER AGENCY REQUIREMENTS

....other federal, state and local regulatory areas which may relate to your implementation of best management practices.

The purpose of this chapter is to provide you with information on a variety of other federal, state and local regulatory areas which may relate to your implementation of best management practices. 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 cursory introduction. Before taking any action on the regulations discussed here, contact the appropriate agency for the complete information and to ensure full compliance if necessary.

- R.1 Water Pollution - King County Code 8.12
- R.2 King County Surface Water Design Manual
- R.3 King County Fire Code
- R.4 Animal (livestock) Regulations - King County Code 21A.30
- R.5 Solid Waste - Seattle-King County Department of Public Health
- R.6 Septic Tanks - Seattle-King County Department of Public Health
- R.7 Local Sanitary Sewer Requirements for the Acceptance of Process Water or Stormwater
- R.8 Discharge of Process Wastewater to Surface Water - Washington State Department of Ecology (Ecology)
- R.9 Generators of Dangerous (hazardous) Wastes - Ecology
- R.10 Groundwater Quality Protection - Ecology
- R.11 NPDES Industrial Stormwater Permit - Ecology

- R.12 Underground Storage Tanks - U.S. Environmental Protection Agency
- R.13 Spill Prevention and Control Plan - U.S. EPA and Ecology
- R.14 Structural Pesticide Applicators - Seattle-King County Department of Public Health
- R.15 Pesticide Regulations - Washington State Department of Agriculture
- R.16 Air Quality - Puget Sound Air Pollution Control Agency
- R.17 Requirements of Native American Tribes

REGULATION 1

The code "prohibits the discharge of contaminants into surface and stormwater and groundwater, and mandates development of preventive measures to reduce contaminants from entering such waters."

King County Code 8.12

The purpose of King County Code 8.12 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 development of 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 *King County Surface Water Design Manual*.

The code 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. Disallowed 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, 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 contaminated water, and any hazardous material or waste not listed above.

This section of the code also lists 10 actions or substances as being allowable discharges. These are: potable water, potable

water flushing, lawn watering, uncontaminated water from crawl space pumping or footing drains, flows from riparian habitats and wetlands, residential car and boat washing, dechlorinated swimming pool water, natural uncontaminated surface or groundwater, certain discharges from boats, and other discharges as determined by the director.

The code directs the King County Surface Water Management Division to develop a manual which requires the use of best management practices (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 single-family residential activities 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, state, or local program unless the County determines the alternative BMPs to be ineffective at reducing the discharge of contaminants.

REGULATION 2

The Surface Water Design Manual requires drainage review and sets requirements for new development and redevelopment to control soil erosion during construction, and to control the flow of stormwater runoff after development is completed.

King County Surface Water Design Manual

Presented here is a summary of selected requirements of the *King County Surface Water Design Manual*. The manual requires drainage review and sets requirements for new development and redevelopment to control soil erosion during construction, and to control the flow of stormwater runoff after development is completed. Drainage review is required for any proposed project that would:

1. Add more than 5,000 square feet of new impervious surface.
2. Collect and concentrate surface and stormwater runoff from a drainage area of more than 5,000 square feet.
3. Contain, or abut, a floodplain, stream, wetland or closed depression, or a sensitive area as defined by the Sensitive Area Ordinance and Rules (King County Chapter 21.54).

The requirements that are most pertinent to businesses are:

1. If a project adds 5,000 or more square feet of impervious surface (buildings, paved surfaces or other structures), a stormwater detention and treatment facility must be installed according to a plan approved by the County (Core Requirement #3).
2. If a project adds 5,000 or more square feet subject to vehicle use (roads, parking lots, driveways, etc.), a biofiltration swale must be used to treat stormwater runoff from those areas (Core Requirement #3).
3. If construction occurs that exposes soil to erosion, an erosion control plan must be approved by the County and implemented (Core Requirement #6).
4. If a detention and treatment facility is installed it must be maintained (Core Requirement #7).

5. If the proposed project area exceeds 1 acre of new impervious surface, certain businesses may be subject to additional stormwater treatment requirements such as a wet pond (Special Requirement #5).
6. If the project area exceeds 5 acres of new impervious surface and is subject to petroleum storage, high vehicular use (more than 2,500 per day), or heavy equipment use or storage, then an oil/water separator is also required (Special Requirement #6).

Refer to the *King County Surface Water Design Manual* for details. The current manual is under revision for pending publication in 1995. The manual is available from the King County Surface Water Management Division.

REGULATION 3

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

King County Fire Code Requirements

Storage of flammable, ignitive, and reactive chemicals and materials must comply with local fire codes. Of particular pertinence are Article 79, storage of flammable and combustible liquids, and Article 80, storage of hazardous materials.

1. Finished products that are flammable and combustible liquids can be stored inside the manufacturing building as long as they are stored in a room separated from the processing area by a two-hour occupancy separation (the wall must be able to withstand fire for two hours before a hole burns through).
2. Container and tank storage areas are to be protected against trespassers by fencing or other control measures. The area is to be kept free of weeds, debris, and other combustible materials.
3. The storage area is to be graded to divert spills away from buildings or surrounded by a 6-inch curb. If a curb is used, a drain shall be provided for draining of accumulations of rainwater or spills.
4. An operator or other competent person shall be in attendance at all times while a tank vehicle or tank car is discharging.
5. The area surrounding a tank or group of tanks shall be provided with drainage or shall be diked to prevent accidental discharge of liquid from endangering adjacent tanks, adjoining property, or reaching waterways.
6. The area within the dikes shall be sloped not less than 1 percent towards an impounding basin or an approved means of disposal.
7. The volume of the diked area shall not be less than the volume of the largest tank.

8. Drains shall be installed to remove water from the diked area. The drains shall not discharge to natural water courses, public sewers or drainage channels unless a valve, operable from outside the dike, prevents the release of flammable or combustible liquids.
9. Regarding loading/unloading, provision shall be made to prevent liquids from entering drainage systems, public sewers or natural waterways. Connections to such systems by which liquids might enter shall have separator boxes.

The construction of a small building to house used engine oils, or other waste products may require sprinklers. See Article 10 of the Fire Code.

See Articles 10, 79, and 80 of the Fire Code for more details.

REGULATION 4

The code establishes regulations which set livestock densities and requires implementation of best management practices for minimizing non-point pollution from livestock.

King County Code 21A.30 Animal (Livestock) Regulations

The purpose of this code is to allow the raising and keeping of livestock in the county in a manner that minimizes the adverse impacts of livestock on the environment. The code establishes regulations which set livestock densities and requires implementation of best management practices for minimizing non-point pollution from livestock. The code requirements are summarized below.

Livestock - Densities

The minimum site which may be used to accommodate livestock is 20,000 square feet, provided that the portion of the total lot area used for confinement or grazing meets the requirements of the code.

The maximum number of livestock allowed varies depending on the uses and the implementation of management standards:

- 1) Commercial dairies are covered by a Washington State Department of Ecology NPDES Permit.
- 2) Six resident animal units per gross acre in stables, barns and other livestock operations with covered confinement areas, provided that no more than three animal units per gross acre are allowed to use uncovered grazing or confinement areas on a full time basis, and that either management standards in the code are met or a farm management plan is implemented and maintained. Higher densities may be allowed subject to the conditional use permit process to confirm compliance with the management standards.
- 3) For all livestock not covered by paragraph 1 or 2, three animal units per gross acre of vegetated site area, provided that the management standards in the code are met or a farm management plan is implemented and maintained. If the above can not be met then: one animal unit per two

acres of vegetated area, provided that the standards for storage and handling of manure are met.

An animal unit consists of one adult horse or bovine, two ponies, or five small livestock.

Livestock - Management Standards

To achieve higher animal densities, management standards must be implemented through either compliance with management standards in the code or development of a farm management plan. A farm management plan is site specific and prepared in conjunction with the King Conservation District. Management standards in both the farm management plan and the code require measures to manage: livestock watering, wetland and stream corridors, grazing and pastures, confinement areas, and manure handling and storage.

Implementation

All existing livestock operations shall either implement a farm management plan or meet the management standards in the code within five years of the adoption of the code (December 1993). A Livestock Oversight Committee has been established to oversee funding mechanisms and recommend funding schedules for programs that implement and evaluate the effectiveness of farm management plans and standards.

REGULATION 5

Solid Waste—The Seattle-King County Department of Public Health

Title 10 outlines requirements for solid waste storage and handling including: used oil, garbage containers, annual waste disposal, and composting.

King County Board of Health Title 10 (January 1, 1993) outlines 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 Title 10:

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. Used oil filters are not to be placed into the solid waste collection system unless thoroughly drained.
2. Garbage containers are to be watertight, equipped with a close-fitting, tight cover or screen, and non-leaking. They are to be cleaned frequently to prevent nuisances. The cleaning water must be disposed of to a sanitary sewer.
3. Dog wastes are to be disposed of in a manner that does not create a nuisance; they may be disposed of in a sanitary sewer but not into a septic tank.
4. Commercial composting facilities: The rule specifies location restrictions with regard to distance from seasonal groundwater, sole source aquifers, drinking water supply wells, surface water bodies, slope, adjacent land uses, sensitive biological resources, and parks (Section 10.48). It specifies that storage piles are to be placed on a surface that prevents subsurface soil and groundwater contamination, such as sealed concrete, asphalt, clay or an artificial liner. Runoff systems are to handle the 24-hour, 25-year event. A groundwater monitoring and leachate detection, collection, and treatment system is required if piles have a capacity of greater than 10,000 cubic yards.
5. Any wastes suspected of being a regulated dangerous waste may be screened by the Health Department. The process

may involve certified testing, a disclosure of the waste constituents and waste generation process, and other additional information. Permits are issued for those wastes that will be allowed in the garbage. If it is determined that the waste is not a regulated dangerous waste but still poses a significant threat, the generator or the transporter may be directed to transfer the waste to a specified treatment or disposal site.

See King County Board of Health Title 10 (January 1, 1993) for more detailed information.

REGULATION 6

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

Septic Tanks—Seattle-King County Department of Public Health

Where wastewater cannot be discharged to a sanitary sewer, it may be possible to use a septic tank/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. See regulatory requirement R.9 in this chapter 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 King County Board of Health Title 13 (1987). The information presented here is of particular relevance to commercial properties.

1. 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.
2. Prior to construction, plans and specifications must be submitted for approval.
3. A preliminary report is to be submitted to the Health Department prior to or concurrent with the preparation of the Plans and Specifications. Title 13 specifies the content of this report.
4. 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.

Title 13 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, drain field, and appurtenances.
5. Special systems such as sand filters and experimental systems.
6. Construction and inspection.
7. Monitoring.

See King County Board of Health Title 13 (1987) for more detailed information.

REGULATION 7

Local Sanitary Sewer Requirements for the Acceptance of Process Water or Stormwater

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

Discharging either process wastewater or stormwater to a public sanitary sewer requires approval of the local sewer authority; in King County this may be an incorporated jurisdiction, city or town, or a sewer district.

The discharge of process wastewater also requires approval by the King County Department of Metropolitan Services (Metro) if the sewage generated in the area is treated by the Metro at its treatment plants. All discharges to the Metro system, either directly or via a sewer utility that discharges to Metro, must be in accordance with Metro rules and Resolution 6534.

Process Wastewater

Contaminated waters from many of the activities presented in Chapter 3 are considered process wastewater and therefore could potentially be discharged to a sanitary sewer. If the business is located in an area without sewers, the wastewater must be properly treated with an appropriate wastewater treatment system prior to discharge to a river, lake, stream, or to a drain field.

Permission to connect to the public sanitary sewer or to begin discharging a new type of wastewater via the business' existing sewer line requires the approval of the local sewer authority. If the local sewer authority discharges its sewage to the Metro system (for eventual treatment) the business must obtain an industrial discharge permit from Metro. Metro and possibly the local sewer authority have established pretreatment restrictions (as required by federal/state regulations) on the quality of the discharge (see below) and therefore it may be necessary for the business to treat the process wastewater before it discharges to the public sanitary sewer. Check with your local sewer authority and Metro for these requirements.

Stormwater

Local sewer authorities in general, and Metro in particular, do not allow the discharge of stormwater to public sanitary sewers except under extreme conditions that are generally defined as meeting the following conditions: the level of contamination of the stormwater is substantially greater than what is found in typical urban runoff, and there is no other viable alternative. Metro has generally been willing to accept stormwater from small areas, when the total contributing drainage area is 200 square feet or less, such as designated areas for washing cars or small trucks. In no case can the discharge result in exceeding the hydraulic capacity of the collection system or the treatment plant by the combined flow of sanitary sewage and stormwater. Stormwater discharges to the sanitary sewer may need to be metered and sewer fees may be collected on such discharges.

In some situations it may not be feasible to enclose the activity that is creating the process water. It would be best in this situation to connect the designated area to the public sanitary sewer and the storm drain with a two-way valve. Thus, stormwater would not enter the public sanitary sewer. However, there may be situations where the stormwater is so contaminated that the most appropriate solution is to allow the stormwater to enter the public sanitary sewer after suitable pretreatment. An example might be a scrap metal recycling area, which is difficult (if not impossible) to keep clean.

If the local sewer authority is not within the Metro service area, and if this sewer authority has not been delegated pretreatment authority by the Washington State Department of Ecology (Ecology), the business must also seek approval of the Northwest Regional office of Ecology.

Pretreatment Requirements

In setting pretreatment requirements, the local sewer authority or Ecology must operate within state regulations WAC 173-216 (State Waste Discharge Permit Program) which in turn must comply with federal regulations 40 CFR 403.5 (National Pretreatment). Specific prohibitions include materials that:

1. Pass through the municipal treatment plant untreated or interfere with its operation.

2. Create a fire or explosion hazard, or create a public nuisance or hazard to life or prevents entry into the sewer for maintenance and repair, or be injurious in any other way to the operation of the system or the operating personnel.
3. Have a pH less than 5.0 or greater than 11.0, or have any corrosive property capable of causing damage or hazard to the system, equipment, or personnel.
4. Will cause obstruction to flows.
5. Will cause the sewage temperature to exceed 40°C or will in any case interfere with the biological activity in the municipal treatment plant.

The allowable concentrations of materials may vary with the particular sewer utility, since the responsibility of setting such limits rests with the local sewer authority, if it has been delegated the authority by Ecology, or by Ecology elsewhere.

Summarized below are the limits established by Metro (Local Industrial Discharge Limits, November 1990). Sewer authorities outside the Metro service area may have different requirements.

1. The concentration of polar (animal or vegetable) or nonpolar (petroleum) fats, oils, and greases shall not exceed 100 mg/L.
2. The average daily concentration of the following cannot exceed the concentration indicated: arsenic, 1 mg/L; cadmium, 0.5 mg/L; chromium, 2.75 mg/L; copper, 3 mg/L; lead, 2 mg/L; mercury, 0.1 mg/L; nickel, 2.5 mg/L; silver, 1 mg/L; zinc, 5 mg/L; cyanide, 2 mg/L.
3. Many classes of organic compounds such as solvents are regulated. Many cannot be discharged into the sewer. Others can be discharged in small quantities. Contact the King County DMS for further information.

REGULATION 8

The Washington Department of Ecology must approve process waste water discharges to a surface water body.

Discharge of Process Wastewater to Surface Water — Washington State Department of Ecology

If a public sanitary sewer is not available, process wastewater must be discharged after suitable treatment to a surface water body like a lake or stream, or to a drainage field. The approval of the Washington State Department of Ecology (Ecology) must be sought, both for the type and design of the treatment system, as well as the design and location of the outfall.

Some specific requirements include:

1. An engineering report must be prepared describing the proposed project. The general contents of the engineering report are specified by Ecology (WAC 173-240). The report is reviewed and approved Ecology.
2. The treatment system must be designed in accordance with Criteria for Sewage Works Design, October 1985, by Ecology.
3. The outfall must be designed in accordance with specific dilution zone dimensions (WAC 173-203-100).
4. The quality of the discharge into the receiving water must be treated and diluted (according to the dilution criteria noted above) so as to not result in a violation of water quality standards (WAC 173-203).
5. The treatment plant must be properly maintained and operated by a certified operator (WAC 173-230).

Recent actions by Ecology suggest it is unlikely to approve the installation of new outfalls except in the large rivers like the Green and Cedar. It is not likely to approve new outfalls in streams or lakes. Land treatment would not likely be acceptable to Ecology unless the operation is limited to the dry months.

REGULATION 9

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

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 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 which 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.
9. The Washington State Department of Ecology (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.

Small-Quantity Waste Generators

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 Seattle-King County Department of Public Health. 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 Seattle-King County Local Hazardous Waste Management Program provides assistance to these businesses. See Chapter 6 for more information.

Dangerous Waste Pollution Prevention Plans

A recent state law established 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.

The schedule for plan submission to Ecology is:

1. By September 1, 1992, for generators that produce more than 50,000 pounds annually.

2. By September 1, 1993, for generators that produce between 7,000 and 50,000 pounds annually.
3. By September 1, 1994, for generators that produce between 2,640 and 7,000 pounds annually.

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 WAC 173-303 and 307 for further detail. Also "Pollution Prevention Planning Guidance Manual," January 1992, #91-2, by Ecology.

REGULATION 10

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:

Washington State has established numeric standards to prevent groundwater pollution.

1. Chemical variables are limited (see the numerical limits shown below). Also shown below are standard concentrations of each variable in stormwater based on local field data.

Variable	Standard	Stormwater	Variable	Standard	Stormwater
Fecal Coliform	1 org/100 ml	1000	Zinc	5.0 mg/l	0.150
Nitrate	10 mg/l	0.20	2,4-D	0.10 mg/l	0.01
Arsenic	0.05 mg/l	0.010	Endrin	0.0002 mg/l	0.0001
Cadmium	0.01 mg/l	0.0006	Lindane	0.004 mg/l	0.00005
Chromium	0.05 mg/l	0.008	Methoxychlor	0.10 mg/l	0.001
Copper	1.0 mg/l	0.020	2,4,5-TP	0.01 mg/l	0.00005
Lead	0.05 mg/l	0.15	Benzene	0.005 mg/l	0.010
Mercury	0.0002 mg/l				

2. Antidegradation measures are set forth. This means 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.

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 WAC 173-200 for more details.

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

NPDES Industrial Stormwater Permit-- Washington State Department of Ecology

The National Pollutant Discharge Elimination System (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 below categories. 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 BMP's 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 King County: coal mining, sand and gravel mining, and paving and roofing material production.
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 non-metallic minerals, except fuels

There are some special conditions for the above facilities. See the Washington State Department of Ecology 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, including 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 which 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

Contact the Department of Ecology for information on the General Industrial Permit at (360) 407-6000..

Businesses with underground storage tanks must comply with USEPA regulations.

Underground Storage Tanks-- U.S. Environmental Protection Agency

Exempt Tanks

These regulations are for underground tanks (tank system having 10 percent or more of its volume underground) containing petroleum or listed hazardous substances. It covers all tanks except:

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.

New Requirements (Tanks Installed After December 1988)

1. Certify that tank and piping are installed properly according to industry codes.
2. Equip with devices that prevent spills and overfills.
3. Protect tank and piping from corrosion.
4. Equip tank and piping with leak detection.

Existing Requirements (Tanks Installed Before December 1988)

1. Equip with leak detection by these dates:

If Tank Was Installed Leak Detection by

Before 1965	1989
1965-1969	1990
1970-1974	1991
1975-1979	1992
1980-December 1988	1993

2. Implement tank filling procedures that will prevent spills and overfills.
3. By December 1998, tanks and piping equipped with corrosion prevention; if the tank does not have corrosion protection or internal lining and devices to prevent spills and overfill, a monthly inventory with tightness testing is required until December 1998.
4. By December 1998, equip to prevent spills and overfills.
5. Leak detection in piping installed by December 1990.
 - a. Pressure piping: devices to automatically shut off or restrict flow or have an alarm that indicates leak. Conduct annual tightness testing or use monthly monitoring methods for tanks.
 - b. Suction piping: monthly monitoring or tightness testing every 3 years at same schedule as leak detection. If suction piping is sloped to draw back to storage tank, or if suction is released and only one check valve is included in each suction line directly below the suction pump, leak detection is not required.
6. If an existing tank has been upgraded with corrosion protection and a device to prevent spills and overfills: a monthly inventory control and tank tightness test must be performed every 5 years. If the tank has not been upgraded, a monthly inventory control and tank tightness test must be performed every year.

Reporting Requirements

1. Notification of installation of tank.
2. Notification of any suspected releases.

3. Confirmed release/corrective action.
4. Notification 30 days before permanent closure.

Reporting of Suspected Releases

Owners/operators must report within 24 hours, or another reasonable time specified by the Washington State Department of Ecology, and follow procedures outlined in the regulations for any of the following:

1. Discovery of release at tank site or surrounding area.
2. Unusual operation conditions such as sudden loss of product, equipment behavior, unexplained water in tank.
3. Monitoring results indicating a release may have occurred unless the monitoring device was found to be defective or, in the case of inventory control, if the second month does not confirm initial data.

Record Keeping Requirements

1. Records of leak detection performance and maintenance; previous year monitoring results and most recent tightness test results, including:
 - a. Leak detection manufacturing performance claims.
 - b. Records of maintenance, repair.
 - c. Calibration of leak detection.
2. Records of the last two corrosion protection system inspections.
3. Expert analysis of corrosion potential if corrosion protection equipment is not used.
4. Minimum of three years after closure, records of site assessment results are required for permanent closure.
5. Records for repaired or upgraded tanks.
6. Check local regulatory requirements.

Spill Prevention and Control Plan—U.S. EPA and Washington State Department of Ecology

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

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

This federal regulation requires that owners or operators of 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 non-transportation 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.

Ecology Dangerous Wastes (WAC 173-303-350)

The regulations state that generators must have a contingency plan that must include:

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. Evaluation plan for business personnel.

See Federal Regulation 40 CFR 112 and WAC 173-303-350 for further detail.

REGULATION 14

Structural Pesticide Applicators - Seattle-King County Department of Public Health

This regulation requires commercial structural pesticide applicators within King County to register with the Seattle-King County Department of Public Health

This regulation (King County Board of Health Title 7) requires commercial structural pesticide applicators within King County to register with the Seattle-King County Department of Public Health and to comply with various requirements. Examples of commercial pest control activities that are subject to King County licensing include the control of the following pests in or upon structures: wood destroying organisms, moss, rodents, spiders, fleas, ants, wasps, cockroaches, flies, and food and commodity pests. Companies that perform work under the Washington State Department of Agriculture categories of General Pest Control Operator, Structural Pest Control Operator, and Structural Demossing are, in most cases, required to maintain the King County license. Requirements include:

1. All companies that are engaged in the business of structural pest control and apply pesticides upon or within structures in King County are to apply for and maintain annual business registration.
2. Each company must have a person on staff who is competent in managing the pesticide application practices of all employees. This person is called a Master Structural Pesticide Applicator.
3. This master pesticide applicator is required to take and pass a Health Department examination to demonstrate competency and safety in pesticide application.

The Health Department is authorized to develop an incentive-based merit system to promote good pesticide management practices. Merit points will be awarded to companies for the following elements: providing customers with pesticide information sheets and guidelines on integrated pest management, operating in accordance with a written policy for integrated pest management, demonstrating proper disposal procedures for pesticides, having a public exposure control plan, and

providing customers with target pest identification services. Merit points accumulated under the system will be used as positive incentives for the pesticide applicators, such as reduced annual fees for license renewal, reduced penalties for confirmed violations of pesticide application standards, designation of the company's merit status on their registration, and non-monetary achievement awards.

See King County Board of Health Title 7 for more detailed information and contact the King County Department of Public Health.

REGULATION 15

Pesticide Regulations - Washington Department of Agriculture

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

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 Act (RCW 17.21), and regulations in WAC 16.228. The requirements relevant to water quality protection are:

1. Persons who apply pesticides are required to be licensed except:
 - 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.
2. Licensed applicators must undergo 40 hours of continuing education to keep the license.
3. No person shall pollute streams, lakes, and other water supplies in pesticide loading, mixing and application.
4. 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 16.228 for further detail.

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

Air Quality—Puget Sound Air Pollution Control Agency

The Puget Sound region is under the jurisdiction of regional air quality authorities who in turn must function under Washington State and federal air quality regulations. The Puget Sound Air Pollution Control Agency (PSAPCA) is the regulatory agency for air quality in King County.

Of direct interest to this manual is air authority policies on fugitive dust and outside painting. PSAPCA requires that reasonable precaution be taken to prevent fugitive particulate material from becoming airborne, when handling, loading, transporting or storing particulate material. PSAPCA 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 enclosure.

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

See Regulation II, PSAPCA, for further detail.

PSAPCA 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 PSAPCA as an acceptable practice.

PSAPCA 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," PSAPCA, for detailed information on dust control requirements.

REGULATION 17

Several tribes in the King County area have lands and continuing treaty interests in natural resources.

Requirements of Native American Tribes

Tribal staff review federal, state, and local permits for projects on tribal lands or projects on non-tribal lands that may affect treaty-reserved resources or areas. Several tribes in the King County area, including the Muckleshoot and Puyallup Indian Tribes and the Tulalip Tribe, have lands and continuing treaty interests in natural resources. Check with their Natural Resource or Environmental Divisions for more information on the treaty rights and the permit review role of the tribes.

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

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 King 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 best management practices in Chapter 3 serve to 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 technical and financial assistance with sources for technical assistance divided and identified according to subject matter and function (such as selecting appropriate BMPs, hazardous waste management, landscaping, and automotive industry). 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 to provide telephone numbers 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 King 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 and residents of unincorporated King County.

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 and residents 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 King County's water quality.

GENERAL BMP SELECTION

King County Surface Water Management Division

The Surface Water Management Division has water quality engineers available to provide free on-site consultations to businesses for implementing the water quality BMP's in this manual. The Division also has a program to recognize businesses that are implementing the BMP's.

*For information, or to request an on-site consultation, contact:
Telephone: (206) 296-1900*

City of Bellevue Business Partners for Clean Water Program

The City's Business Partners for Clean Water Program focuses on five types of businesses: construction, automotive, building maintenance, food service, and landscaping. The Business Partners Program is able to provide assistance to businesses throughout King County as long as some of their work is performed within Bellevue. The program refers businesses to other similar business operations to share pertinent information about effective BMPs. The City has also developed stormwater

BMP manuals for these five types of business. The manuals include specialized BMP guidance tailored specifically to the operations of those kinds of businesses.

For information or to obtain copies of the manuals, contact:

City of Bellevue
Business Partners for Clean Water Program
P.O. Box 90012
Bellevue, WA 98009
Telephone: (206) 637-5216

Getting Help: A Guide to Technical Assistance from Ecology

This guide provides information on technical assistance offered by the Washington State Department of Ecology. It includes a description of Ecology's programs with contacts and phone numbers. It also indicates which programs are useful to businesses.

To obtain a copy of the guide, contact:

Publications Distribution Office
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-7472
Order by title and publication number 92-106.

King Conservation District

The Conservation District can provide technical assistance for a variety of stormwater pollution control efforts related to residences, small businesses, commercial farms, and hobby farms. Advice is available on effective erosion-control practices and methods for specific site conditions, including stream bank stabilization and slope stabilization techniques. The Conservation District also has experience in controlling water quality problems on commercial and hobby farms. Personnel are available for site visits and can assist in effective stormwater pollution prevention planning for individual sites. The Conservation District does not assist with BMP implementation on large business sites (such as malls) or industrial sites.

For information, contact:

King Conservation District
935 Powell Avenue SW
Renton, WA 98055
Telephone: (206) 226-4867

King County Department of Metropolitan Services—Water Resources Section

Metro has participated in several BMP performance evaluation studies and has implemented BMPs at several Metro facilities. Staff are knowledgeable about the performance of individual stormwater BMPs and their application in a variety of situations.

For information, contact:

Metro Water Resources Section
821 Second Avenue
Mail Stop 81
Seattle, WA 98104-1598
Telephone: (206) 684-1233

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

King County Department of Metropolitan Services—Industrial Waste Section

Metro provides information on what can be discharged to the sanitary sewer and works with businesses to meet individual discharge requirements. Metro can also assist with information for rerouting illicit storm sewer connections to the sanitary sewer.

For information, contact:

Metro Industrial Waste Section
130 Nickerson Street, Suite 200
Seattle, WA 98109
Telephone: (206) 689-3000

Local Sewer Agency

If you are not served by Metro, contact your local sewer agency for information on allowable discharges. The name of your local sewer agency is identified on your water and sewer bill.

HAZARDOUS WASTE MANAGEMENT

The Business Waste Line - 296-3976

The Business Waste Line has staff to answer questions from small businesses about hazardous waste. The Waste Line staff make referrals to other agencies and vendors and send out printed materials. The Waste Line may also be used to report complaints and hazardous waste violations. Calls are anonymous if requested.

For information, contact:

The Business Waste Line
Telephone: (206) 296-3976

Hazardous Waste Library

The Hazardous Waste Library offers small businesses, citizens, agency staff, and local officials one place to go for hazardous waste information. The library has a wealth of onsite resources and is linked by computer to environmental information throughout the world. Anyone in King County can request help in person or by phone. The library can track down information, drawing on contacts in the community, government, trade associations, various industries, and other libraries.

For more information, contact:

Seattle/King County Hazardous Waste Library
130 Nickerson Street, Suite 100
Seattle, WA 98109
Telephone: (206) 689-3051

Hazardous Waste: A Management Guide for Local Businesses

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, contact:

The Business Waste Line
Telephone: (206) 296-3976

Hazardous Waste Onsite Consultation Program

The Onsite Consultation Program provides free onsite 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:

Seattle/King County Hazardous Waste Program
130 Nickerson Street, Suite 100
Seattle, WA 98109
Telephone: (206) 689-3090

The Hazards Line - 296-4692

This telephone hot-line provides hazardous waste information and referrals to the general public. (Businesses should call the Business Waste Line, also listed in this Reference Guide.) The Hazards Line tells citizens where to dispose of their hazardous waste and suggests less hazardous alternatives. It also provides operations times and locations for household disposal sites for King County and the City of Seattle.

For information, contact:

The Hazards Line
Telephone: (206) 296-4692

Seattle-King County Department of Public Health Waste Characterization

This program serves businesses in Seattle and King County that have questionable wastes. Information supplied by the generator on questionable wastes such as sludges, sandblast waste, treated wood, and contaminated soils is reviewed by the Health

Department. Written authorizations are issued for those wastes that will be allowed in the garbage.

For information, contact:

Telephone: 296-4633

Waste Information Network (WIN)

This program provides information on hazardous waste management to small businesses. WIN's emphasis is on providing innovative and effective ideas for handling a variety of wastes and making compliance with waste-related regulations easier. WIN meets once a month to provide a forum for discussion of hazardous waste management ideas and offers presentations on waste management strategies, products, equipment, and services. WIN has also developed industry-specific waste management brochures. Information from WIN can assist businesses that are implementing stormwater BMPs to control pollution from onsite 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:

Waste Information Network
130 Nickerson Street, Suite 100
Seattle, WA 98109
Telephone: (206) 689-3063

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 TSD Information

The source of information on businesses that provide services in regard to dangerous waste treatment, storage, and disposal (TSD), and information on applicable regulations for TSD businesses.

Contact:

Washington State Department of Ecology Headquarters
Olympia, Washington 98504
Telephone: (360) 407-6000

or:

Washington State Department of Ecology Northwest
Regional Office (Bellevue)
Telephone: (206) 649-7000

COMMERCIAL AND HOBBY FARMS

Washington State University Cooperative Extension—King County

The Extension Service 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. Although the Extension Service cannot make individual site visits, staff can advise on effective BMPs, supporting information, and other groups to contact for further information.

For information, contact:

WSU Cooperative Extension—King County
612 Smith Tower
Seattle, WA 98104-2394

Telephone: (206) 296-3900

or (206) 296-DIAL for prerecorded information on hundreds of topics related to gardening, horticulture, and agriculture

King Conservation District

See page 3 for description.

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:
King County Resource Planning Section
Telephone: (206) 296-7590

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 \$85.95), contact:

AAN Publications
1250 I Street NW, Suite 500
Washington, D.C. 20005
Telephone: (202) 789-2900

**Washington State University Cooperative Extension -
King County**

See page 8 for description.

***BUILDING AND LAND USE
REQUIREMENTS***

**King County Department of Development and
Environmental Services**

The Department of Development and Environmental Services (DDES) 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 DDES 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:

King County DDES
3600 136th Place SE
Bellevue, WA 98006-1400
Telephone: (206) 296-6620

King County Fire Marshal

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

For information, contact:

King County Fire Marshal
3600 136th Place SE
Bellevue, WA 98006-1400
Telephone: (206) 296-6675

King County Sensitive Areas Ordinance User's Manual

King County has enacted a Sensitive Areas Ordinance (SAO) to define and protect certain land and water features throughout the county. The Environmental Education Section of King County's Department of Development and Environmental Services (DDES) has prepared an SAO User's Manual that serves as a reference for the SAO in an easy-to-understand format. The SAO User's Manual can help determine special considerations that may be necessary for implementation of BMPs within or near a designated sensitive area. The King County Environmental Education Section also offers training at the community level on sound development practices (including BMPs) related to erosion control, clearing and grading, wildlife, and sensitive areas

To obtain a copy of the SAO User's Manual, contact:

King County DDES
Environmental Education Section
3600 136th Place SE
Bellevue, WA 98006-1400
Telephone: (206) 296-6602

EROSION CONTROL PRACTICES

Master Builders Association of King and Snohomish Counties

This is a business association primarily for residential construction companies. Members have experience in applying erosion-control BMPs on both small and large sites. The 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:

Master Builders Association
2155 112th Avenue NE, Suite 100
Bellevue, WA 98004
Telephone: (206) 451-7920

Associated General Contractors Water Quality Manual: Waste Disposal and Erosion/Sediment Control Methods

This manual is a guide book for contractors and field staff that answers questions and provides resources in the areas of waste

disposal and erosion/sediment control. It provides information on recommended water quality protection methods for contractors who maintain equipment yards or are involved in building construction or site preparation activities, such as clearing and grading.

For information or to obtain a copy of this manual, contact:

Associated General Contractors
1200 Westlake Avenue North, Suite 310
Seattle, WA 98109
Telephone: (206) 284-0061

King County Surface Water Design Manual

This manual contains the requirements and standards for designing surface and stormwater management systems in King County. It also includes a chapter on erosion control requirements for permitted sites.

To Obtain a copy of the manual, contact:

King County Surface Water Management Division
700 Fifth Ave, Suite 2200
Seattle, WA 98104
Telephone: (206) 296-6519

Stormwater Management Manual for the Puget Sound Basin

This manual was developed by the Department of Ecology as a model for local governments. It contains requirements for stormwater management system design, erosion control, and urban best management practices. Volume II discusses erosion and sediment control.

To obtain the manual, contact:

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

King Conservation District

See page 3 for description.

RECYCLING AND REUSE PRACTICES

King County Solid Waste Division - Business Recycling Program

This program assists businesses with recycling by: 1) providing information on waste reduction and recycling services for your particular needs; 2) helping you work with your employees to promote participation; 3) offering information on buying recycled products; and 4) providing you with ongoing support to ensure your program is successful. The program also runs "GreenWorks" a special program which recognizes individual business recycling efforts.

For more information, contact:

Business Recycling Program
King County Solid Waste Division
400 Yesler Way, Room 600
Seattle, WA 98104
Telephone: (206) 296-4356

The Guidebook for Implementing Curbside and Dropoff Used Oil Collection Programs

Washington Citizens for Recycling, a nonprofit organization, has prepared this guidebook for general public use to enhance used oil recycling efforts. Businesses interested in recycling used oil can use this guidebook to determine how they can recycle oil efficiently as well as how they can team with other businesses to form joint oil recycling programs.

For information on obtaining the guidebook, contact:

Washington Citizens for Recycling
157 Yesler Way, Suite 309
Seattle, WA 98104

Oil Collection Technical Assistance Guide

This is a guide designed to help you set up an oil recycling site at your store, shop, or service station.

To obtain a copy of the guide, contact:

King County Solid Waste Division
400 Yesler Way, Rm 600
Seattle, WA 98104
Telephone: (206) 296-4363

Industrial Materials Exchange (IMEX)

IMEX provides a free service helping businesses that have surplus materials find businesses that need them. As an alternative to disposal, exchanges reduce disposal costs for generators, enable secondary users to obtain useful materials at low cost (or no cost), and reduce the amount of material that is permanently disposed. Surplus or waste materials, such as solvents, paint, plastics, and wood, are exchanged. IMEX provides this service through a bimonthly catalog, which is mailed to businesses in the region. The catalog lists materials available and materials wanted. Materials are also listed on the National Materials

Exchange Network computer bulletin board (accessible by computer modem). IMEX is a component of the Local Hazardous Waste Management Program in King County, which is a multiagency effort.

For information on the catalog or computer service, contact:

IMEX

201 Smith Tower

Seattle, WA 98104

Telephone: (206) 296-4899

Computer modem access number for the National Materials

Exchange Network bulletin board: (509) 466-1019

Shoptalk Newsletter

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

For information, contact:

Solid and Hazardous Waste Program

Washington State Department of Ecology

P.O. Box 47600

Olympia, WA 98504-7600

Telephone: (360) 407-6000

Washington State Department of Ecology Waste Reduction, Recycling, and Litter Control Program

The Department of Ecology has extensive information on recycling, including details on types of wastes that can be recycled, lists of commercial vendors that recycle certain types

of wastes, and locations of dropoff stations for recyclable materials.

For recycling information, contact:

Washington State Department of Ecology

Telephone: 1-800-RECYCLE (1-800-732-9253)

SOLID WASTE DISPOSAL

King County Solid Waste Division

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

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

King County Solid Waste Division

General Information

Telephone: (206) 296-6542

For information on the disposal of construction, demolition, and land clearing debris, contact:

Regional Disposal

Telephone: (206) 646-2400

Seattle-King County Department of Public Health Waste Characterization

See page 6 for description.

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 the King 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

Sound Watch, an Environmental Guide for Boaters

This easy-to-read guide, published by 48° North—The Sailing Magazine, provides specific information on BMPs applicable to individual boating activities and marinas. Information is included on environmentally sound recycling and disposal options, boat maintenance practices, and on-shore and on-the-dock material handling practices. The guide presents a concise discussion of why boat-related BMPs are necessary and how they can be routinely implemented at minimal cost. The guide has been distributed throughout western Washington at marinas and other waterfront facilities.

For a copy of the guide, inquire at a local marina office or contact:

48° North
6327 Seaview Avenue NW
Seattle, WA 98107
Telephone: (206) 789-7350

Boat Building and Repair Facilities NPDES Waste Discharge Permit

The Department of 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:
The Department of Ecology
Permit Coordinator
3600 136th Place SE
Bellevue, WA 98006-1400
Telephone: (206) 649-7201

FOREST-CLEARING PRACTICES

King County Clearing and Grading Section

Forest-clearing activities in King County that are categorized as Class IV—General Forest Practices require stormwater management plans as part of permit applications. The King County Clearing and Grading Section, in the Department of Development and Environmental Services, will offer information on effective BMP strategies to include in stormwater management plans for proposed clearing sites. This section reviews the permit applications, so its advice on stormwater BMPs can assist in the preparation of successful applications.

For information, contact:

King County Clearing and Grading Section
3600 136th Place SE
Bellevue, WA 98006-1400
Telephone: (206) 296-6610

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
P.O. Box 68
Enumclaw, WA 98022
Telephone: (206) 825-1631

AUTOMOTIVE INDUSTRY

Auto Industry Guides to Managing Hazardous Wastes

The Washington State Department of 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:

Publications Distribution Office
Washington State Department of Ecology
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.

A Water Quality Resource Manual for the Automotive Service Industry

This manual serves as an educational tool to facilitate compliance with water quality regulations. The manual includes information on water quality problems and regulations, guidance on how to develop shop-specific BMPs and policies, and case studies on the problems and solutions of three repair shops in this region.

To obtain a copy of this manual, contact:

Puget Sound Alliance
130 Nickerson Street, Suite 107
Seattle, WA 98109
Telephone: (206) 286-1309

Vehicle Recycler Facilities

The Washington Department of Ecology has prepared a guidance document to assist vehicle recyclers in selecting best management practices. The title is "Best Management Practices to Prevent Stormwater Pollution at Vehicle Recycler Facilities."

To obtain the document, contact:

Publications Distribution Office
Washington State Department of Ecology
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

or Metro Telephone: (206) 689-3000

LABOR AND TECHNICAL SUPPORT FOR IMPLEMENTATION

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 Corp's 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 the Department of 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

Senior Environmental Corps

The Senior Environmental Corps is a group of citizens, age 55 and older, that offers volunteer technical assistance on a variety of environmental pollution issues and projects, often in conjunction with the Washington Conservation Corps. The Senior Environmental Corps can provide technical information and research assistance on stormwater pollution prevention problems but does not offer labor services for construction or cleanup projects. As with the Washington Conservation Corps, requests for services must be made by a government agency overseeing its efforts. The nine agencies that oversee the Senior Environmental Corps are the state departments of Ecology, Agriculture, Community Development, Fisheries, Wildlife, Health, Natural Resources, and Parks and Recreation, and the Puget Sound Water Quality Authority. Outside requests for services must be directed to one of these agencies.

For information, contact:

Senior Environmental Corps
P.O. Box 4760
Olympia, WA 98504-7600
Telephone: 1-800-243-7890

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 King 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

The Cascadia Revolving Fund is a loan program designed to enhance the Northwest's quality of life. The fund provides loans to nonprofit organizations and profit businesses who are unable to secure financing through traditional sources, either due to their size or nature of the business. Cascadia supports financing that creates jobs or improves the environment. The application procedure is comprehensive. Once a loan has been approved, Cascadia staff work directly with the business to improve fiscal management procedures.

For information, contact:
Cascadia Revolving Fund
Attention: Terri Shapiro
157 Yesler, Suite 414
Seattle, WA 98104
Telephone: (206) 447-9226

Local Conservation Districts

The state Conservation Commission administers two programs through which businesses could receive funding assistance. The Nonpoint Water Quality Program funds up to 75 percent of project costs for implementation of water quality projects and has a total of \$500,000 every two years available for statewide projects. The Water Quality Research Grant Program has \$200,000 every two years available for basic research for solving high-priority water quality problems. The Conservation Districts must apply for monies from the Conservation Commission. Businesses must, therefore, work through the local Conservation District to develop project ideas within the context of the District's goals and obtain the District's written approval.

For information, contact:
King Conservation District
935 Powell Avenue SW

Renton, WA 98055-2908
Telephone: (206) 226-4867

Pacific Northwest Pollution Prevention Research Center

The Pacific Northwest Pollution Prevention Research Center (PPRC) is a nonprofit organization that mobilizes funds from the public and private sectors to sponsor applied research and other projects that will further the implementation of pollution prevention in the Pacific Northwest. In this capacity, the PPRC may offer funding to businesses in King County for specific pollution prevention demonstration projects. The PPRC also acts as an information broker, catalyst, and facilitator of information exchange and research on pollution prevention and toxic use reduction.

For more information, contact:

Pacific Northwest Pollution Prevention Research Center
1218 Third Avenue, Suite 1205
Seattle, WA 98101
Telephone: (206) 223-1151

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, yet in order to obtain the loan, the business must still work with its own private lender.

For information, contact:

Small Business Administration
915 Second Avenue
Seattle, WA 98104
Telephone: (206) 220-6500

Incentives Database - Pollution Prevention Grants, Loans, and Awards

This database contains over 30 sources of incentives for small businesses to develop or use pollution prevention techniques or equipment. It covers award, loan, and grant programs and is maintained by the Seattle/King County Hazardous Waste

Library. The Library maintains informational files for each entry which contain information such as: eligible recipients, amount funded, percentage fundable, how to apply, and appropriate contacts.

For more information, contact:

Seattle/King County Hazardous Waste Library
130 Nickerson Street, Suite 100
Seattle, WA 98109
Telephone: (206) 689-3051

Individual Banks

Often, the best source of information regarding funding options for source-control and treatment BMPs is a business's own bank. A bank with which 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 simple call to the bank or lending institution may save a significant amount of time for a business looking for funding opportunities.

QUICK PHONE REFERENCE

Cascadia Revolving Fund	(206) 447-9226
City of Bellevue Business Partners for Clean Water Program	(206) 451-4476
King Conservation District	(206) 226-4867
King County Department of Development and Environmental Services	
Clearing and Grading	(206) 296-6610
Environmental Services	(206) 296-6602
Fire Marshall	(206) 296-6675
Permits	(206) 296-6620
King County Department of Metropolitan Services (METRO)	
Local hazardous waste management program—general number	(206) 689-3050
Hazardous waste on-site consultation	(206) 689-3090
Industrial discharge permits to sanitary sewer	(206) 689-3000
Hazardous waste library	(206) 689-3051
Water Resources Section	(206) 684-1233
Waste Information Network (WIN)	(206) 689-3063
King County Solid Waste Division	
General Information	(206) 296-6542
Business Recycling Program	(206) 296-4356
Construction, Demolition, and Land Debris Disposal	(206) 642-2400
King County Surface Water Management Division	
Main Desk	(206) 296-6519
To request a free on-site consultation:	(206) 296-1900
Master Builders Association	(206) 451-7920
Northwest Marine Trade Association	(206) 634-0911
Pacific Northwest Pollution Prevention Research Center	(206) 223-1151
Puget Sound Air Pollution Control Agency (PSAPCA)	(206) 296-7330

QUICK PHONE REFERENCE

Seattle-King County Health Department

Information on septic tanks and garbage containers	Contact District Office
Business Waste Line	(206) 296-3976
Waste characterization service	(206) 296-4633
Hazards Line (for households)	(206) 296-4692
Industrial Materials Exchange (IMEX)	(206) 296-4899
or computer modem access	(509) 466-1019
Pesticide applicator licensing	(206) 296-4783

Senior Environmental Corps 1-800-243-7890

Small Business Administration (206) 220-6500

University of Washington Center for Urban Horticulture-Elisabeth C. Miller Library (206) 543-8616

Washington State Department of Ecology

Northwest Regional Office (Bellevue)	(206) 649-7000
Waste reduction and recycling	1-800-RECYCLE
Reporting of Spills	(206) 649-7000
Washington Conservation Corps	(360) 407-6000
Publications Distribution Office	(360) 407-7472

Washington State Department of Natural Resources (206) 825-1631

Washington State University Cooperative Extension - King County (206) 296-3900
or for prerecorded information

Washington Toxics Coalition (206) 632-1545