Volume IV – Source Control

Chapter 1 - Introduction 1-1

1.1 Purpose 1-1
1.2 How to Use this Volume 1-1
1.3 Operational and Structural Source Control BMPs 1-1

Chapter 2 - Worksheet for Multi-Family, Commercial and Industrial Sites 2-3

Chapter 3 - Selection of Operational and Structural Source Control BMPs 3-1

3.1 Introduction 3-1
3.2 Applicable Operational Source Control BMPs 3-1
3.3 Activity Specific BMPs 3-4
3.3.1 ....Activity Code A1 - Cleaning and Washing Activities 3-4
A1.1.... Cleaning or Washing of Tools, Engines, and Manufacturing Equipment 3-4
A1.2.... Cleaning or Washing of Cooking Equipment 3-5
A1.3.... Washing, Pressure Washing, and Steam Cleaning of Vehicles, Equipment, or Building Structures 3-6
A1.4.... Collection and Disposal of Wastewater in Mobile Interior Washing Operations 3-7
3.3.2 ....Activity Code A2 - Transfer of Liquid or Solid Materials 3-9
A2.1.... Loading and Unloading Areas for Liquid or Solid Material 3-9
A2.2.... Fueling at Dedicated Stations 3-10
A2.3.... Engine Repair and Maintenance 3-12
A2.4.... Mobile Fueling of Vehicles and Heavy Equipment 3-14
3.3.3 ....Activity Code A3 - Production and Application Activities 3-16
A3.1.... Concrete and Asphalt Mixing and Production at Stationary Sites 3-16
A3.2.... Concrete Pouring, Concrete Cutting, and Asphalt Application at Temporary Sites 3-17
A3.3.... Manufacturing and Post-processing of Metal Products 3-18
A3.4.... Wood Treatment Areas 3-19
A3.5.... Commercial Composting 3-20
A3.6.... Landscaping and Lawn/Vegetation Management 3-21
A3.7.... Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment 3-25
A3.8.... Commercial Printing Operations 3-26
A3.9.... Manufacturing Operations (Outside) 3-27
A3.10.. Agricultural Crop Production 3-28
A3.11.. Application of Pesticides, Herbicides, Fungicides, and Rodenticides for Purposes Other than Landscaping 3-29
3.3.4 ....Activity Code A4 - Storage and Stockpiling Activities 3-30
A4.1.... Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products 3-30
A4.2.... Storage and Treatment of Contaminated Soils 3-31
A4.3.... Temporary Storage or Processing of Fruits or Vegetables 3-31
A4.4.... Storage of Solid Wastes and Food Wastes 3-32
A4.5.... Recyclers and Scrap Yards 3-34
A4.6.... Treatment, Storage, or Disposal of Dangerous Wastes 3-35
A4.7.... Storage of Liquid or Dangerous Waste Containers 3-35
A4.8.... Storage of Liquids in Permanent Aboveground Tanks 3-36
A4.9.... Parking and Storage for Vehicles and Equipment 3-37

A4.10.. Storage of Pesticides, Fertilizers, or Other Products That Can Leach Pollutants 3-37
3.3.5 ....Activity Code A5 - Construction and Demolition Activities.....3-39
A5.1.... Demolition of Buildings.....3-39
A5.2.... Building Repair, Remodeling, Painting, and Construction.....3-39
3.3.6 ....Activity Code A6 - Dust Control and Soil and Sediment Control.....3-41
A6.1.... Dust Control at Disturbed Land Areas and Unpaved Driving and Parking Areas.....3-41
A6.2.... Dust Control at Manufacturing Sites.....3-42
A6.3.... Soil Erosion and Sediment Control at Industrial Sites.....3-43
3.3.7 ....Activity Code A7 - Other Activities.....3-44
A7.1.... Commercial Animal Handling Areas.....3-44
A7.2.... Keeping Livestock in Stables, Pens, Pastures, or Fields.....3-44
A7.3.... Log Sorting and Handling.....3-45
A7.4.... Boat Building, Mooring, Maintenance, and Repair.....3-46
A7.5.... Logging.....3-48
A7.6.... Mining and Quarrying of Sand, Gravel, Rock, Minerals, Peat, Clay, and Other Materials.....3-48
A7.7.... Swimming Pool and Spa Cleaning and Maintenance.....3-49
A7.8.... De-icing and Anti-icing Operations for Airports, Private Roadways and Parking Lots.....3-50
A7.9.... Roof and Building Drains at Manufacturing and Commercial Buildings.....3-51
A7.10.. Railroad Yards.....3-52
A7.11.. Maintenance of Private Utility Corridors and Facilities.....3-52
A7.12.. Maintenance of Stormwater Drainage and Treatment Facilities.....3-53
A7.13.. Spills of Oil and Hazardous Substances.....3-54
A7.14.. Elimination of Illicit Connections to Storm Drainage System.....3-55

Chapter 4 - Source Control BMP Descriptions.....4-1

4.1 Index of BMP Descriptions.....4-1
4.2 Source Control BMPs.....4-1
4.2.1 ....S.1 Dispose of Collected Runoff and Waste Materials Properly.....4-1
4.2.2 ....S.2 Connect Process Water Discharges to a Sanitary Sewer, Holding Tank, or Wastewater Treatment System.....4-2
4.2.3 ....S.3 Cover the Activity with a Roof or Awning.....4-3
4.2.4 ....S.4 Cover the Activity with an Anchored Tarpaulin or Plastic Sheet.....4-3
4.2.5 ....S.5 Pave the Activity Area and Slope to a Sump or Holding Tank.....4-3
4.2.6 ....S.6 Surround the Activity Area with a Curb, Berm, or Dike, or Elevate the Activity.....4-4
4.2.7 ....S.7 Implement Integrated Pest Management Measures.....4-5

Figures

Figure 1.1 Activity Worksheet.....2-4

Chapter 1 - Introduction

1.1 Purpose

The purpose of this volume is to provide information for meeting Minimum Requirement #3 – Source Control of Pollution (see Volume I).

Source control BMPs are operations or structures that are intended to prevent pollutants from coming into contact with stormwater. Many of these BMPs are common sense and "house-keeping" issues. For instance, an indoor or outdoor work area can be swept to remove debris instead of hosing the debris into a storm drain or other drainage conveyance. The use of source control BMPs should always the first line of defense in stormwater pollution control efforts for two main reasons:

- In the majority of cases, source control BMPs are all that is needed to prevent or correct stormwater pollution problems.
- Most source control BMPs are relatively inexpensive and easy to implement.

If source control is not adequately implemented, then treatment BMPs must be utilized *after* pollution has entered stormwater. Treatment BMPs are expensive, and can never remove 100 percent of the pollution in stormwater. It is far better to use source control BMPs where possible and prevent the pollution in the first place.

Stormwater treatment may still be required for certain types of businesses, regardless of the implementation of source control measures, because of the type of pollutions present or the condition of the site. These businesses are identified in this volume. Volume III contains detailed information about stormwater treatment BMPs.

1.2 How to Use this Volume

This volume must be consulted to select specific BMPs for source control for inclusion in Stormwater Site Plans (see Volume I).

Chapter 2 contains a worksheet to help identify activities on sites that may contribute to stormwater pollution. If any of the activities are checked off any and will be **performed outdoors or can affect the stormwater drainage system**, the activity code on the worksheet must be used to find the BMPs in Chapter 3 that are required for the site. Chapter 4 contains specific BMPs.

1.3 Operational and Structural Source Control BMPs

There are two categories of Source Control BMPs: Operational and Structural.

<u>Operational Source Control BMPs</u> are non-structural practices that prevent or reduce pollutants from entering stormwater. Operational Source Control BMPs are considered the most cost-effective pollutant minimization practices. Examples of Operational Source Control BMPs typically include:

- Formation of a pollution prevention team
- Good housekeeping practices
- Preventive maintenance procedures
- Spill prevention and cleanup
- Employee training

- Inspections of pollutant sources

Operational Source Control BMPs can also include process changes, raw material/product changes, and recycling wastes.

Structural Source Control BMPs are physical, structural, or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. Examples of Structural Source Control BMPs typically include:

- Enclosing and/or covering the pollutant source (e.g. within a building or other enclosure, a roof over storage and working areas, temporary tarp, etc.).
- Physically segregating the pollutant source to prevent run-on of uncontaminated stormwater.
- Devices that direct only contaminated stormwater to appropriate treatment BMPs (e.g., discharge to a sanitary sewer if allowed by the local sewer authority).

Chapter 2 - Worksheet for Multi-Family, Commercial and Industrial Sites

The worksheet on the following pages is designed for use by site designers of multi-family, commercial, and industrial sites. This worksheet and the BMPs are organized by the different activities that are conducted at these sites.

The entire worksheet must be completed by checking the appropriate boxes for all activities that will occur at the work place. If any of the activities are checked off any and will be **performed outdoors or can affect the stormwater drainage system**, the activity code on the worksheet must be used to find the BMPs in Chapter 3 that are required for the site.

Any activities checked off that occur indoors at the site are exempt from implementing additional BMPs, provided that all discharges from the activity are controlled (e.g., process water, washwater, lubricants, solvents, fugitive dust, granular material, blow down waste, etc.) such that no exposure to stormwater occurs. No discharge from indoor drains or processes can ultimately contact stormwater or be transported to surface waters, and liquids, powders, dusts, and fine granular materials must stay confined indoors; otherwise, the site will be subject to all of the BMP requirements.

The City's Industrial Pretreatment Program at (425) 257-8874 must be contacted regarding any discharges to the sanitary sewer.

The completed worksheet shall be included as part of the Source Control Plan section of the Stormwater Site Plan (see Volume I, Chapter 3.2.8)

Figure 1.1 Activity Worksheet

Activity Code	Type of Activity	Check if this activity will occur on the site
A1	**Cleaning and Washing**	
A1.1	Cleaning or Washing of Tools, Engines, and Manufacturing Equipment • This activity includes parts washers and all types of manufactured equipment components.	
A1.2	Cleaning or Washing of Cooking Equipment • This activity includes vents, filters, pots and pans, grills, and related items.	
A1.3	Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures • This activity covers cleaning and washing at all types of establishments, including fleet vehicle yards, car dealerships, car washes, and maintenance facilities.	
A1.4	Collection and Disposal of Wastewater from Mobile Interior Washing Operations • This activity includes carpet cleaners, upholstery cleaners, and drapery cleaners.	
A2	**Transfer of Liquid or Solid Materials**	
A2.1	Loading and Unloading Areas for Liquid or Solid Material	
A2.2	Fueling at Dedicated Stations • This activity includes gas stations, pumps at fleet vehicle yards or shops, and other privately owned pumps.	
A2.3	Engine Repair and Maintenance • This activity covers oil changes and other engine fluids.	
A2.4	Mobile Fueling of Vehicles and Heavy Equipment • This activity includes mobile fleet fueling, wet fueling, and wet hosing.	
A3	**Production and Application**	
A3.1	Concrete and Asphalt Mixing and Production at Stationary Sites • This activity applies to mixing of raw materials on-site to produce concrete or asphalt.	
A3.2	Concrete Pouring, Concrete Cutting, and Asphalt Application at Temporary Sites • This activity includes construction sites, and driveway and parking lot resurfacing.	
A3.3	Manufacturing and Post-processing of Metal Products • This activity includes machining, grinding, soldering, cutting, welding, quenching, rinsing, etc.	
A3.4	Wood Treatment Areas • This activity includes wood treatment using pressure processes or by dipping or spraying.	
A3.5	Commercial Composting • This activity includes commercial composting facilities operating with exposure to rainfall	

Activity Code	Type of Activity	Check if this activity will occur on the site
A3.6	Landscaping and Vegetation Management Activities, Including Vegetation Removal, Herbicide and Insecticide Application, Fertilizer Application, Irrigation, Watering, Gardening, and Lawn Care • This activity includes businesses involved in landscaping, applying pesticides and managing vegetation.	
A3.7	Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment • This activity includes surface preparation and the applications of paints, finishes, and/or coatings.	
A3.8	Commercial Printing Operations • This activity includes materials used in the printing process.	
A3.9	Manufacturing Activities – Outside • This activity includes outdoor manufacturing areas.	
A3.10	Agricultural Crop Production • This activity addresses commercial scale farming.	
A3.11	Application of Pesticides, Herbicides, Fungicides and Rodenticides for purposes other than landscaping • This activity includes moss removal and outdoor insect extermination.	
A4	**Storage and Stockpiling**	
A4.1	Storage or Transfer (Outside) of Solid Raw Materials, By-products, or Finished Products	
A4.2	Storage and Treatment of Contaminated Soils	
A4.3	Temporary Storage or Processing of Fruits or Vegetables • This includes processing activities at wineries, fresh and frozen juice makers, and other food and beverage processing operations.	
A4.4	Storage of Solid Wastes and Food Wastes • This includes regular garbage and all other discarded non-liquid items.	
A4.5	Recyclers and Scrap Yards • This includes scrapped equipment, vehicles, empty metal drums, and assorted recyclables.	
A4.6	Treatment, Storage, or Disposal of Dangerous Wastes • Refer to Ecology and the Snohomish Health District for more information; see Appendix B for contact numbers.	
A4.7	Storage of Liquid, Food Waste, or Dangerous Waste Containers • This includes containers located outside a building and used for temporary storage.	
A4.8	Storage of Liquids in Permanent Aboveground Tanks • Includes all liquids in aboveground tanks.	
A4.9	Parking and Storage for Vehicles and Equipment • Includes public and commercial parking lots	
A4.10	Storage of Pesticides, Fertilizers, or other products that can leach pollutants.	
A5	**Construction and Demolition**	
A5.1	Demolition of Buildings • Applies to removal of existing buildings and subsequent clearing of the rubble.	

Activity Code	Type of Activity	Check if this activity will occur on the site
A5.2	Building Repair, Remodeling, and Construction • Applies to construction of buildings, general exterior building repair work and remodeling of buildings.	
A6	**Dust Control and Soil Erosion and Sediment Control**	
A6.1	Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots	
A6.2	Dust Control at Manufacturing Sites • Includes grain dust, sawdust, coal, gravel, crushed rock, cement, and boiler fly ash.	
A6.3	Soil Erosion and Sediment Control (ESC) at Industrial Sites • Includes industrial activities that take place on soil.	
A7	**Other Activities**	
A7.1	Commercial Animal Handling • This includes kennels, fenced pens, veterinarians, and businesses that groom or board animals.	
A7.2	Keeping of Livestock in Stables, Pens, Pastures or Fields • Applies to all types of livestock.	
A7.3	Log Sorting and Handling • Applies to log yards typically located at sawmills, ports, and pulp mills.	
A7.4	Boat building, Mooring, Maintenance, and Repair • This includes all types of maintenance, repair, and building operations.	
A7.5	Logging • Applies to logging activities that fall under Class IV general forest practices.	
A7.6	Mining and Quarrying of Sand, Gravel, Rock, Minerals, Peat, Clay, and Other Materials • This does not include excavation at construction sites.	
A7.7	Swimming Pool and Spa Cleaning and Maintenance • This includes every swimming pool and spa not at a single family residence. Commercial pool cleaners are included here for all pools.	
A7.8	De-icing and Anti-icing Operations for Airports and Streets • Includes aircraft, runways/taxiways, streets and highways.	
A7.9	Roof and Building Drains at Manufacturing and Commercial Buildings • These sites will be referred to the Puget Sound Clean Air Agency.	
A7.10	Railroad Yards	
A7.11	Maintenance of Private Utility Corridors and Facilities	
A7. 12	Maintenance of Stormwater Drainage and Treatment Facilities	
A7.13	Spills of Oil and Hazardous Substances	
A7.14	Elimination of Illicit Connections	

Chapter 3 - Selection of Operational and Structural Source Control BMPs

3.1 Introduction

This chapter coordinates with the worksheet in Chapter 2. The worksheet and the BMPs are organized by the different activities that businesses perform. Again, if the listed activity will be performed indoors, and all discharges from the activity (e.g., process water, washwater, lubricants, solvents, fugitive dust, granular material, blow down waste, etc.) will be controlled such that no exposure to stormwater occurs, then additional source control BMPs are not required for that activity. However, if checked activities will be performed outdoors, or may result in exposure of stormwater to pollutants, the number from the worksheet must be matched to the activities listed in this chapter to find the required Source Control BMPs for the site.

Some businesses are or will be required to obtain a NPDES permit for stormwater discharges. These permits are issued and regulated by Ecology. Types of businesses (listed by Standard Industrial Classification (SIC) code) that must apply with Ecology to obtain this type of permit are listed in Appendix A. Businesses that are regulated under the Industrial NPDES stormwater program may be exempt from implementing some of the BMPs outlined in this volume, since they will be implementing BMPs required by the state. Refer to Appendix A for more information about NPDES permits for industries.

3.2 Applicable Operational Source Control BMPs

The following operational source control BMPs are required, as applicable, for source control at projects required to meet Minimum Requirement #3: Source Control of Pollution (see Volume I, Chapter 2). ***Include the applicable operational source control BMPs as part of the Source Control Plan.***

<u>Formation of a Pollution Prevention Team</u>

1. Assign one or more individuals to be responsible for stormwater pollution control. Hold regular meetings to review the overall operation of the BMPs. Establish responsibilities for inspections, operation and maintenance, and availability for emergency situations. Train all team members in the operation, maintenance and inspections of BMPs, and reporting procedures.

<u>Good Housekeeping</u>

1. Promptly contain and clean up solid and liquid pollutant leaks and spills including oils, solvents, fuels, and dust from manufacturing operations on any exposed soil, vegetation, or paved area.
2. Sweep paved material handling and storage areas regularly as needed, for the collection and disposal of dust and debris that could contaminate stormwater. Do not hose down pollutants from any area to the ground, storm drain, conveyance ditch, or receiving water unless necessary for dust control purposes to meet air quality regulations and unless the pollutants are conveyed to a treatment system approved by the local jurisdiction.
3. Clean oils, debris, sludge, etc. from all BMP systems regularly, including catch basins, settling/detention basins, oil/water separators, boomed areas, and conveyance systems, to prevent the contamination of stormwater. Refer to Appendix A for references to assist in determining if a waste must be handled as hazardous waste.
4. Promptly repair or replace all substantially cracked or otherwise damaged paved secondary containment, high-intensity parking and any other drainage areas, which are subjected to pollutant material leaks or spills.

5. Promptly repair or replace all leaking connections, pipes, hoses, valves, etc. which can contaminate stormwater.
6. Clean up pollutant liquid leaks and spills in impervious uncovered containment areas at the end of each working day.
7. Use solid absorbents, e.g., clay and peat absorbents and rags for cleanup of liquid spills/leaks, where practicable.
8. Recycle materials, such as oils, solvents, and wood waste, to the maximum extent practicable.

Preventative Maintenance

1. Prevent the discharge of unpermitted liquid or solid wastes, process wastewater, and sewage to ground or surface water, or to storm drains which discharge to surface water, or to the ground.
2. Do not connect floor drains in potential pollutant source areas to storm drains, surface water, or to the ground.
3. Conduct all oily parts cleaning, steam cleaning, or pressure washing of equipment or containers inside a building, or on an impervious contained area, such as a concrete pad. Direct contaminated stormwater from such an area to a sanitary sewer where allowed by the City, or to other approved treatment.
4. Do not pave over contaminated soil unless it has been determined that ground water has not been and will not be contaminated by the soil. Call Ecology for assistance.
5. Construct impervious areas that are compatible with the materials handled. Portland cement concrete, asphalt, or equivalent material may be considered.
6. Use drip pans to collect leaks and spills from industrial/ commercial equipment such as cranes at ship/boat building and repair facilities, log stackers, industrial parts, trucks and other vehicles, which are stored outside.
7. At industrial and commercial facilities, drain oil and fuel filters before disposal. Discard empty oil and fuel filters, oily rags and other oily solid waste into appropriately closed and properly labeled containers, and in compliance with the Uniform Fire Code.
8. For the storage of liquids use containers, such as steel and plastic drums, that are rigid and durable, corrosion resistant to the weather and fluid content, non-absorbent, water tight, rodent-proof, and equipped with a close fitting cover.
9. For the temporary storage of solid wastes contaminated with liquids or other potential pollutant materials use dumpsters, garbage cans, drums and comparable containers, which are durable, corrosion resistant, non-absorbent, non-leaking, and equipped with either a solid cover or screen cover to prevent littering. If covered with a screen, the container must be stored under a lean-to or equivalent structure.
10. Where exposed to stormwater, use containers, piping, tubing, pumps, fittings, and valves that are appropriate for their intended use and for the contained liquid.
11. Where feasible, store potential stormwater pollutant materials inside a building or under a cover and/or containment.
12. Minimize use of toxic cleaning solvents, such as chlorinated solvents, and other toxic chemicals.
13. Use environmentally safer raw materials, products, additives, etc. such as substitutes for zinc used in rubber production.

14. Recycle waste materials such as solvents, coolants, oils, degreasers, and batteries to the maximum extent feasible. Refer to Appendix C for recommendations on recycling or disposal of vehicle waste liquids and other waste materials.
15. Empty drip pans immediately after a spill or leak is collected in an uncovered area.
16. Stencil warning signs at stormwater catch basins and drains, e.g., "Dump no waste."

Spill Prevention and Cleanup

1. Stop, contain, and clean up all spills immediately upon discovery of the spill.
2. If pollutant materials are stored on-site, have spill containment and cleanup kits readily accessible.
3. If the spill has reached or may reach a sanitary or a storm sewer, ground water, or surface water notify Ecology and the City immediately. Notification must comply with all federal spill reporting requirements. (See also record keeping at the end of this chapter and BMPs for Spills of Oil and Hazardous Substances)
4. Do not flush absorbent materials or other spill cleanup materials to a storm drain. Collect the contaminated absorbent material as a solid and place in appropriate disposal containers.
5. Place and maintain emergency spill containment and cleanup kit(s) at outside areas where there is a potential for fluid spills. These kits should be appropriate for the materials being handled and the size of the potential spill.

   Note: Ecology recommends that the kit(s) include salvage drums or containers, such as high density polyethylene, polypropylene or polyethylene sheet-lined steel; polyethylene or equivalent disposal bags; an emergency response guidebook; safety gloves/clothes/equipment; shovels or other soil removal equipment; and oil containment booms and absorbent pads; all stored in an impervious container.

Employee Training

1. Train all employees that work in pollutant source areas in identifying pollutant sources and in understanding pollutant control measures, spill response procedures, and environmentally acceptable material handling practices - particularly those related to vehicle/equipment liquids such as fuels, and vehicle/equipment cleaning. Use Ecology's "Guidance Manual for Preparing/Updating a Stormwater Pollution Prevention Plan for Industrial Facilities" (Publication Number 04-10-030) as a training reference.

Inspections

1. Conduct visual inspections quarterly during storm events to achieve following:
   a. Verify that the descriptions of the pollutant sources identified in the stormwater pollution control program are accurate.
   b. Verify that the stormwater pollutant controls (BMPs) being implemented are adequate.
   c. Update the site map to reflect current conditions.
   d. Include observations of the presence of floating materials, suspended solids, oil and grease, discoloration, turbidity and odor in the stormwater discharges; in outside vehicle maintenance/repair; and liquid handling and storage areas. In areas where acid or alkaline materials are handled or stored use a simple litmus or pH paper to identify those types of stormwater contaminants where needed.
2. In addition, conduct at least one dry season inspection each year.

a. Determine whether there is/are unpermitted non-stormwater discharges to storm drains or receiving waters, such as process wastewater and vehicle/equipment washwater, and either eliminate or obtain a permit for such a discharge.

Record Keeping

Retain the following reports for three years:

1. Visual inspection reports which should include: scope of the inspection, the personnel conducting the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP (performance of the BMPs, etc.) and actions taken to correct BMP inadequacies.
2. Reports on spills of oil or hazardous substances in greater than Reportable Quantities (Code of Federal Regulations Title 40 Parts 302.4 and 117), including the following: oil, gasoline, or diesel fuel, that causes a violation of the State of Washington's Water Quality Standards, or, that causes a film or sheen upon or discoloration of the waters of the State or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.
3. To report a spill or to determine if a spill is a substance of a Reportable Quantity, call Ecology's Northwest Regional office at (425) 649-7000 and ask for an oil spill operations or a hazardous waste specialist. *Also refer to Emergency Spill Response in Washington State, Publication # 97-1165-CP*.

3.3 Activity Specific BMPs

3.3.1 Activity Code A1 - Cleaning and Washing Activities

A1.1 Cleaning or Washing of Tools, Engines, and Manufacturing Equipment

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

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

Pollutant Control Approach: The preferred approach is to cover and/or contain the cleaning activity or conduct the activity inside a building, to separate the uncontaminated stormwater from the pollutant sources. Washwater must be conveyed to a sanitary sewer after approval by the City, temporarily stored before proper disposal, or recycled – with no discharge to the ground, a storm drain, or surface water. Washwater may be discharged to the ground after proper treatment in accordance with *Ecology guidance WQ-R-95-56, "Vehicle and Equipment Washwater Discharges," June 1995*. The quality of any discharge to the ground after proper treatment must comply with Ecology's Ground Water Quality Standards, Chapter 173-200 WAC. Contact the Ecology Northwest Regional Office for an NPDES permit application for discharge of washwater to surface water or to a storm drain after onsite treatment.

Required BMPs

The following BMPs, or equivalent measures, are required of all businesses and public agencies engaged in cleaning or washing of vehicles, tools, engines, equipment, and portable objects:

1. Employees shall be educated to control washing operations to prevent stormwater contamination.

2. All washwater must discharge to a holding tank, process treatment system, or sanitary sewer – never to the stormwater drainage system. See **BMP S.3** in Chapter 4 for detailed information on how this must be accomplished.
3. Pressure washing must be done in a designated area (such as a wash pad) provided with a sump drain and stormwater run-on prevention. See **BMPs S.6 and S.7** in Chapter 4 for information on sumps (or holding tanks) and run-on prevention. Contact the City's Industrial Pretreatment Program (425) 257-8874 for washing operation policy.
4. If soaps or detergents are used, use the least toxic cleaner capable of doing the job. Use non-phosphate detergent, if possible, to reduce loading at the City's wastewater treatment plant.
5. Limit the amount of water used in washing activities to reduce the potential of runoff carrying pollutants beyond the designated wash pad or capture system.
6. Recycle washwater for subsequent washings, if possible.

A1.2 Cleaning or Washing of Cooking Equipment

Description of Pollutant Sources: This activity applies to businesses that clean cooking equipment such as vent filters, grills, and grease traps outside of buildings.

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

Pollutant Control Approach: Businesses engaged in this activity that cannot connect discharges to a sanitary sewer, holding tank, or process water treatment system must contact Ecology and obtain a NPDES wastewater permit.

Required BMPs

The following BMPs or equivalent measures are required of all businesses engaged in cleaning or washing of cooking equipment:

1. Illicit connections to the stormwater drainage system must be eliminated. See BMP S.1 in Chapter 4 for detailed requirements.
2. Employees must be educated about the need to prevent stormwater contamination from washing operations.
3. Washwater cannot be discharged to the stormwater drainage system.
4. Paved washing areas must be swept daily to collect loose solid materials for proper disposal.
5. Greasy buildup on cooking equipment must be removed and properly disposed of prior to washing to reduce the amount of material that can potentially contaminate runoff.
6. Move the activity indoors, into either an existing building or a newly constructed building or shed, with drainage to a sanitary sewer, holding tank, or process treatment system. See BMP S.3 in Chapter 4 for further information on drainage alternatives. Any connection to the sanitary sewer requires the approval of the City's Industrial Pretreatment Program at (425) 257-8874; OR

   Use a tub or similar device to contain washwater. This water must be recycled for subsequent washing, or disposed of in a holding tank or sanitary sewer; OR

   If the washing activity cannot be moved indoors or contained in a tub, then the washing area must drain to a sanitary sewer, holding tank, or process treatment system, and provisions must be made to prevent stormwater run-on onto the washing area. See BMP S.3 in Chapter 4 for detailed drainage requirements and BMP S.7 for run-on prevention schemes. If discharging to a sanitary

sewer, authorization must be obtained from the City's Industrial Pretreatment Program at (425) 257-8874.

7. If a holding tank is used for storage of washwater, the contents must be pumped out before it is full and disposed of appropriately to a sanitary sewer or wastewater treatment system.
8. A cover must be placed over a designated wash area to keep rain from falling on dirty equipment and producing contaminated runoff.

A1.3 Washing, Pressure Washing, and Steam Cleaning of Vehicles, Equipment, or Building Structures

Description of Pollutant Sources: Vehicles, aircraft, vessels, carpets, industrial equipment, and large buildings may be commercially cleaned with low or high pressure water or steam. This includes frequent "charity" car washes at gas stations and commercial parking lots. The cleaning can include hand washing, scrubbing, sanding, etc. Washwater from cleaning activities can contain oil and grease, suspended solids, heavy metals, soluble organics, soaps, and detergents that can contaminate stormwater.

Pollutant Control Approach: The preferred approach is to cover and/or contain the cleaning activity, or conduct the activity inside a building, in order to prevent the pollution of stormwater. Washwater must be conveyed to a sanitary sewer after approval by the City's Industrial Pretreatment Program, temporarily stored before proper disposal, or recycled – with no discharge to a storm drain or surface water unless an NPDES permit is obtained from Ecology for the discharge. Washwater may be discharged to the ground after proper treatment in accordance with *Ecology guidance WQ-R-95-56, "Vehicle and Equipment Washwater Discharges," June 1995 (Revised 9/2007)*. The quality of any discharge to the ground after proper treatment must comply with Ecology's Ground Water Quality Standards, Chapter 173-200 WAC. Contact the Ecology Northwest Regional Office for an NPDES permit application for discharge of washwater to surface water or to a storm drain after onsite treatment. Wash water from residential applications which meet the Ecology guidance for small dischargers may discharge to a landscaped or grassy area where the washwater will soak into the ground and/or evaporate.

Required BMPs

Vehicle/equipment washing should be performed in one of the following locations:

1. At a commercial washing facility in which the washing occurs in an enclosure and drains to the sanitary sewer, or
2. In a building constructed specifically for washing of vehicles and equipment, which drains to a sanitary sewer.

If vehicle/equipment washing must be conducted outdoors, it shall occur in a designated wash area with the following features:

1. The area shall be paved, preferably with Portland cement, and shall be constructed as a spill containment pad to prevent the run-on of stormwater from adjacent areas. The spill containment area shall be sloped so that washwater is collected in a containment pad drain system with perimeter drains, trench drains, or catchment drains. The containment pad shall be sized to extend out a minimum of four feet on all sides of the vehicles and/or equipment being washed.
2. A Portland cement spill containment pad is required for steam cleaning activities.
3. The washwater shall be conveyed to a sump (like a grit separator) and then to the sanitary sewer, or other appropriate wastewater treatment or recycle system. An NPDES permit may be required for any washwater discharge to a storm drain or receiving water after treatment. Contact the Ecology Northwest Regional Office for NPDES permit requirements.

4. Wash areas draining to the sanitary sewer shall be covered, or some other method provided, to prevent the entry of significant volumes of rainwater into the separate sanitary sewer system.
5. Any discharge to the sanitary sewer requires the approval of the City's Industrial Pretreatment Program at (425) 257-8874.
6. The wash area must be well marked at gas stations, multifamily residences, and any other business where non-employees wash vehicles.
7. For uncovered wash pads, a positive control outlet valve must be provided. This valve may be manually operated, but a pneumatic or electric valve system is preferable. The valve may be on a timer circuit where it is opened upon completion of a wash cycle. The timer would then close the valve after the sump or separator is drained.

   Note that the purpose of the valve is to convey only washwater and contaminated stormwater to a treatment system.
8. Phosphate-free biodegradable detergents shall be used when practicable.
9. Recycling of the washwater must be considered.
10. Because soluble/emulsifiable detergents can be used in the wash medium, the selection of soaps and detergents and treatment BMPs should be considered carefully. Oil/water separators are ineffective in removing emulsified or water soluble detergents.
11. At commercial parking lots, where it is not possible to discharge the washwater to a sanitary sewer, a temporary plug or a temporary sump pump can be used at the storm drain to collect the washwater for offsite disposal.
12. Charity car washes are not allowed to discharge washwater to the City stormwater drainage system.
13. New and used car dealerships may wash vehicles in the parking stalls without soap, or if an approved treatment system for the washwater is in place.

At industrial sites, Ecology's Northwest Regional Office must be contacted for NPDES permit requirements even if soaps, detergents, and/or other chemical cleaners are not used in washing trucks.

A1.4 Collection and Disposal of Wastewater in Mobile Interior Washing Operations

Description of Pollutant Sources: This activity applies to businesses that wash carpets and other interior items on a mobile site-to-site basis. The typical fleet washing process includes use of machines that spray the washwater solution onto the carpet or upholstery and then vacuums the dirty solution up into a portable tank with limited capacity.

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

Pollutant Control Approach: Common practice in the past was to discharge the dirty solution onto the ground or to a drain connected to the stormwater drainage system between site visits. ***These practices are now illegal.*** **Wastewater must be poured into a sanitary sewer drain at the site of collection, the business office, or at another proper location. If discharging to a sanitary sewer, permits must be obtained from the City's Industrial Pretreatment Program at (425) 257-8874. If sanitary sewer disposal is not available or not allowed, the collected wastewater must be returned to the business site for process treatment or transfer to a holding tank.**

Required BMPs

1. Absolutely no wastewater from mobile interior wash activities can be disposed of outdoors, or to a drain connected to the stormwater drainage system. This point must be made clear to all employees. Wastewater from mobile washing operations may be permitted for sanitary sewer disposal if it does not contain high concentrations of toxic materials. Some of the chemicals used for flea and odor control are listed by U.S. Environmental Protection Agency (U.S. EPA) as toxics. The City's Industrial Pretreatment Program at (425) 257-8874 will need to know the type of chemicals and amount of water that will be discharged. If the discharge is approved, authorization will be granted for the activity. Wastewater must be poured into a sanitary sewer drain at the site of collection, the business office, or at another proper location.
2. If sanitary sewer disposal is not available or is not allowed, the collected wastewater must be returned to the business site for process treatment or transfer to a holding tank. See BMP S.3 in Chapter 4 for details on these drainage/disposal alternatives.
3. Use the least toxic detergents and cleaners that will get the job done. Select non-phosphate detergents when possible.
4. Limit the amount of water used in interior washing operations. This will save time, money, and effort when it comes to proper disposal.
5. Recycle washwater for more than one use, if possible

3.3.2 Activity Code A2 - Transfer of Liquid or Solid Materials

A2.1 Loading and Unloading Areas for Liquid or Solid Material

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

Pollutant Control Approach: Cover and contain the loading/ unloading area where necessary to prevent run-on of stormwater and runoff of contaminated stormwater.

Required BMPs

At All Loading/Unloading Areas:

1. A significant amount of debris can accumulate at outside, uncovered loading/unloading areas. Sweep these surfaces frequently to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered for a period of time by containers, logs, or other material after the areas are cleared.
2. Place drip pans, storm drain covers or other appropriate temporary containment devices at locations where leaks or spills may occur such as hose connections, hose reels, and filler nozzles. Drip pans shall always be used when making and breaking connections. Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.
3. Consistent with Uniform Fire Code requirements and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building or under a roof, lean-to, or other appropriate cover.
4. Berm, dike, and/or slope the loading/unloading area to prevent run-on of stormwater and to prevent the runoff or loss of any spilled material from the area.
5. Large loading areas frequently are not curbed along the shoreline. As a result, stormwater passes directly off the paved surface into surface water. Place curbs along the edge, or slope the edge such that the stormwater can flow to an internal stormwater drainage system that leads to an approved treatment BMP.
6. Pave and slope loading/unloading areas to prevent the pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they should be placed in designated “alleyways” that are not covered by material, containers, or equipment.
7. To minimize the risk of accidental spillage, prepare an “Operations Plan” that describes procedures for loading/unloading. Train the employees, especially fork lift operators, in its execution and post it or otherwise have it readily available to employees and regulatory officials.
8. Report spills of reportable quantities to Ecology Northwest Regional Office (refer to Appendix B for telephone number).

9. Prepare and implement an emergency spill cleanup plan for the facility (Activity A7.14 Spills of Oil and Hazardous Substances) which includes the following BMPs:
    a. Ensure cleanup of liquid/solid spills in the loading/unloading area immediately if a significant spill occurs, upon completion of the loading/unloading activity, or at the end of the working day.
    b. Retain and maintain an appropriate oil spill cleanup kit on site for rapid cleanup of material spills (see Activity A7.14 Spills of Oil and Hazardous Substances).
    c. Ensure that an employee trained in spill containment and cleanup is present during loading/unloading.
10. For the transfer of pollutant liquids in areas that cannot contain a catastrophic spill, install an automatic shutoff system in case of unanticipated off-loading interruption (e.g., coupling break, hose rupture, overfill, etc.).

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

Install a drip pan system as illustrated within the rails to collect spills/leaks from tank cars and hose connections, hose reels, and filler nozzles.

Loading/Unloading from/to Marine Vessels:

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

Transfer of Small Quantities from Tanks and Containers:

Refer to BMPs A4.8 Storage of Liquids in Permanent Aboveground Tanks and A4.7 Storage of Liquid, Food Waste, or Dangerous Waste Containers for requirements on the transfer of small quantities from tanks and containers, respectively.

At Loading and Unloading Docks:

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

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

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

A2.2 Fueling at Dedicated Stations

Description of Pollutant Sources: A fueling station is a facility dedicated to the transfer of fuels from a stationary pumping station to mobile vehicles or equipment. It includes above or under-ground fuel storage facilities. In addition to general service gas stations, fueling may also occur at 24-hour

convenience stores, construction sites, warehouses, car washes, manufacturing establishments, port facilities, and businesses with fleet vehicles. Typically, stormwater contamination at fueling stations is caused by leaks/spills of fuels, lube oils, radiator coolants, and vehicle washwater.

Pollutant Control Approach: New or substantially remodeled fueling stations must be constructed on an impervious concrete pad under a canopy/roof to keep out rainfall and stormwater run-on. Substantial remodeling includes replacing the canopy or relocating or adding one or more fuel dispensers in such a way that the Portland cement concrete (or equivalent) paving in the fueling area is modified. Contaminated stormwater and wastewaters from the fueling containment area shall be discharged to the sanitary sewer, process treatment, or a dead-end sump.

Required BMPs

For New or Substantially Remodeled Fueling Stations:

1. An emergency spill response and cleanup plan (per Activity A7.14 Spills of Oil and Hazardous Substances) shall be developed and shall have designated trained person(s) available either on site or on call at all times to promptly and properly implement that plan and immediately cleanup all spills. Suitable cleanup materials, such as dry adsorbent materials, must be kept on site to allow prompt cleanup of a spill.
2. Employees shall be trained on the proper use of fuel dispensers. Post signs in accordance with the Uniform Fire Code. Post "No Topping Off" signs (topping off gas tanks causes spillage and vents gas fumes to the air). Make sure that the automatic shut off on the fuel nozzle is functioning properly.
3. The person conducting the fuel transfer must be present at the fueling pump during fuel transfer, particularly at unattended or self-serve stations.
4. Drained oil filters shall be kept in a suitable container or drum.
5. The fueling island shall be designed to control spills (with a dead-end sump or spill control separator in compliance with the Uniform Fire Code) and to discharge contaminated stormwater and/or wastewater to the sanitary sewer, process treatment, or a dead-end sump. The concrete containment pad around the fueling island shall be sloped toward drains: trench drains, catch basins, and/or a dead-end sump. The slope of the drains shall not be less than 1 percent (Section 7901.8 of the Uniform Fire Code). Drains to treatment shall have a shutoff valve, which must be closed in the event of a spill. The spill control sump must be sized in compliance with Section 7901.8 of the Uniform Fire Code, OR

   The fueling island shall be designed as a spill containment pad with a sill or berm raised to a minimum of 4 inches (Section 7901.8 of the Uniform Fire Code) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. Raised sills are not required at the open-grate trenches that connect to an approved drainage-control system.
6. The fueling pad must be paved with Portland cement concrete, or equivalent. Asphalt is not considered an equivalent material.
7. The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad. The roof or canopy should, at a minimum, cover the spill containment pad (within the grade break or fuel dispensing area) and preferably extend several additional feet to reduce the introduction of windblown rain. Convey all roof drains to storm drains outside the fueling containment area.
8. Stormwater collected on the fuel island containment pad must be conveyed to a sanitary sewer system, if approved by the City's Industrial Pretreatment Program at (425) 257-8874; or to process treatment of a dead-end sump.

9. Conveyance of any fuel-contaminated stormwater to a sanitary sewer must be approved by the City and must comply with pretreatment regulations (WAC 173-216-060). Contact the City's Industrial Pretreatment Program at (425) 257-8874.
10. Transfer the fuel from the delivery tank trucks to the fuel storage tank(s) in impervious contained areas and ensure that appropriate overflow protection is used. Alternatively, cover nearby storm drains during the filling process and use drip pans under all hose connections.

Additional BMP for Vehicles 10 Feet in Height or Greater:

A roof or canopy may not be practicable at fueling stations that regularly fuel vehicles that are 10 feet in height or greater, particularly at industrial or WSDOT sites. At those types of fueling facilities, the following BMPs apply, as well as all of the other required BMPs and fire prevention Uniform Fire Code requirements.

1. If a roof or canopy is impractical, the concrete fueling pad must be equipped with emergency spill control, which includes a shutoff valve for the drainage from the fueling area. The valve must be closed in the event of a spill. An electronically actuated valve is preferred to minimize the time lapse between spill and containment. Spills must be cleaned up and disposed of off-site in accordance with Activity A7.14 Spills of Oil and Hazardous Substances.
2. The valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the City's Industrial Pretreatment Program at (425) 257-8874, or to oil removal treatment such as an American Petroleum Institute (API) or coalescing plate oil/water separator, or equivalent treatment, and then to a basic treatment BMP. See Volume III for more information. Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen.

A2.3 Engine Repair and Maintenance

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

- A1.3 Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures
- A2.1 Loading and Unloading Areas for Liquid or Solid Material
- A2.2 Fueling at Dedicated Stations
- A3.4 Painting, Finishing, and Coating of Vehicles, Products, and Equipment
- A4.1 Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products
- A4.7 Storage of Liquid, Food Waste, or Dangerous Waste Containers
- A4.8 Storage of Liquids in Permanent Aboveground Tanks
- A7.3 Vehicle and Equipment Parking and Storage
- A7.14 Spills of Oil and Hazardous Substances

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

Pollutant Control Approach: Control of leaks and spills of fluids using good housekeeping and cover and containment BMPs.

Required BMPs

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

1. Employees must be educated about the need for careful handling of automotive fluids. Employees at businesses or agencies who routinely change or handle these fluids must be trained in spill response and cleanup procedures. Inspect all incoming vehicles, parts, and equipment stored temporarily outside for leaks.
2. Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
3. Empty fuel filters before disposal.
4. Spill cleanup materials, such as rags and absorbent materials, must always be kept close at hand when changing oil and other fluids. Compliance with sewer and stormwater requirements is easier by running a 'dry shop', thereby reducing consumption/discharge of liquids. Soiled rags and other cleanup material must be properly disposed of or cleaned and reused. Contact Snohomish County Solid Waste at (425) 388-3425 for proper disposal options.
5. No drains inside maintenance buildings may connect to the sanitary sewer without prior written approval by the City - contact the City's Industrial Pretreatment Program at (425) 257-8874. Interior drains will not be allowed to be connected to the stormwater drainage system.
6. The maintenance/repair area shall not be hosed down. Instead, the area shall be swept weekly to collect dirt, and wipe up spills with rags and other absorbent materials.
7. If the work is done at a mobile location, such as a construction site, a tarpaulin, ground cloth, or drip pans must be used beneath the vehicle or equipment to capture all spills and drips. The collected drips and spills must be recycled or disposed of properly. See BMP S.2 in Chapter 4 for disposal options.
8. If this activity occurs at a stationary business location, the activity area must be moved indoors. An exception to this requirement would be equipment that is too large to fit under a roofed area. In this case, the outdoor area must be paved, provided with a sump drain, and provision made for stormwater run-on prevention. See BMP S.6 and S.7 in Chapter 4 for more on paving, sump drains and holding tanks, and run-on prevention. Contact the City's Industrial Pretreatment Program at (425) 257-8874 for information on requirements for disposal to sewer. If you are on a septic tank, sump contents will need to be pumped and disposed of by an oil recycler or hazardous waste company.
9. Oil, antifreeze, batteries, and air conditioning coolant shall be recycled.
10. Contaminated stormwater runoff from vehicle staging and maintenance areas must be conveyed to an API or coalescent plate oil and water separator followed by a basic treatment BMP (see Volume III), applicable filter, or other equivalent oil treatment system.
11. All fluids from wrecked vehicles and 'parts' cars/equipment shall be drained upon arrival. Air conditioning gases shall be recovered.

12. Where practical, reusable cloth rags shall be used to cleanup drips and small spills instead of disposables. These can be professionally laundered and reused – they should not be laundered at home or at a coin-op laundry.
13. Absorbent pillows or booms shall be used in or around storm drains and catch basins to absorb oil and fuel.

A2.4 Mobile Fueling of Vehicles and Heavy Equipment

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

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

Pollutant Control Approach: Proper training of the fueling operator and the use of spill/drip control and reliable fuel transfer equipment with backup shutoff valving are typically needed.

Required BMPs

Organizations and individuals conducting mobile fueling operations must implement the following BMPs.

1. The operating procedures for the driver/operator should be simple, clear, effective and their implementation verified by the organization that will potentially be liable for environmental and third party damage.
2. All mobile fueling operations shall be approved by the City Fire Department and shall comply with City and Washington State fire codes.
3. Ensure the compliance with all 49 CFR 178 requirements for DOT 406 cargo tanker. Documentation from a U.S. Department of Transportation Registered Inspector shall be proof of compliance.
4. Ensure the presence and the constant observation/monitoring of the driver/operator at the fuel transfer location at all times during fuel transfer and ensure that the following procedures are implemented at the fuel transfer locations:
    a. Locating the point of fueling at least 25 feet from the nearest storm drain or inside an impervious containment with a volumetric holding capacity equal to or greater than 110 percent of the fueling tank volume, or covering the storm drain to ensure no inflow of spilled or leaked fuel. Cover storm drains except those that convey the inflow to a spill control separator approved by the City, including the City Fire Department. Potential spill/leak conveyance surfaces must be impervious and in good repair.
    b. Placing a drip pan or an absorbent pad under each fueling location prior to and during all dispensing operations. The pan (must be liquid tight) and the absorbent pad must have a capacity of 5 gallons. Spills retained in the drip pan or the pad need not be reported.
    c. Handling and operating of fuel transfer hoses and nozzle, drip pan(s), and absorbent pads as needed to prevent spills/leaks of fuel from reaching the ground, storm drains, and receiving waters.

   d. Not extending the fueling hoses across a traffic lane without fluorescent traffic cones, or equivalent devices, conspicuously placed so that all traffic is blocked from crossing the fuel hose.
   e. Removing the fill nozzle and cessation of filling when the automatic shut-off valve engages. Do not allow automatic shutoff fueling nozzles to be locked in the open position.
   f. Not "topping off" the fuel receiving equipment.

5. Provide the driver/operator of the fueling vehicle with:
   a. Adequate flashlights or other mobile lighting to view fill openings with poor accessibility. Consult with the City Fire Department for additional lighting requirements.
   b. Two-way communication with his/her home base.
6. Train the driver/operator annually in spill prevention and cleanup measures and emergency procedures. Make all employees aware of the significant liability associated with fuel spills.
7. The fueling operating procedures should be properly signed and dated by the responsible manager, distributed to the operators, retained in the organization files, and made available in the event an authorized government agency requests a review.
8. Ensure that the City Fire Department (911) and the Ecology Northwest Regional Office are immediately notified in the event of any spill entering the surface or groundwater. Establish a "call down list" to ensure the rapid and proper notification of management and government officials should any significant amount of product be lost off site. Keep the list in a protected but readily accessible location in the mobile fueling truck. The "call down list" should also pre-identify spill response contractors available in the area to ensure the rapid removal of significant product spillage into the environment.
9. Maintain a minimum of the following spill cleanup materials in all fueling vehicles, that are readily available for use:
   a. Non-water absorbents capable of absorbing 15 gallons of diesel fuel
   b. A storm drain plug or cover kit
   c. A non-water absorbent containment boom of a minimum 10 feet in length with a 12-gallon absorbent capacity
   d. A non-metallic shovel; and
   e. Two 5-gallon buckets with lids.
10. Use automatic shutoff nozzles for dispensing the fuel. Replace automatic shut-off nozzles as recommended by the manufacturer.
11. Maintain and replace equipment on fueling vehicles, particularly hoses and nozzles, at established intervals to prevent failures.
12. Include the following fuel transfer site components:
    a. Automatic fuel transfer shut-off nozzles; and
    b. An adequate lighting system at the filling point.

3.3.3 Activity Code A3 - Production and Application Activities

A3.1 Concrete and Asphalt Mixing and Production at Stationary Sites

Description of Pollutant Sources: This activity applies to businesses and agencies that mix raw materials onsite to produce concrete or asphalt. It also applies to subsequent uses such as pouring concrete structures and making other concrete or asphalt products. Mobile concrete pouring and asphalt application are covered under **Activity A3.2** in this chapter. Requirements for stockpiling of raw materials are covered under **Activity A4.1 Storage or Transfer (Outside) of Solid Raw Materials, By-products or Finished Products.**

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

Pollutant Control Approach: Cover and contain processes where possible and prevent stormwater run-on and contamination, where feasible.

Any facility categorized under SIC Code 2951 (asphalt paving mixtures and blocks) or SIC Code 3273 (ready-mix concrete) may need to comply with Ecology's sand and gravel general permit. Contact Ecology at (425) 649-7000 for additional information.

Required BMPs

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

1. Eliminate all illicit connections to the stormwater drainage system. See BMP S.1 in Chapter 4 for a detailed discussion on identifying and eliminating these connections.
2. All process water from production, pouring, and equipment cleaning must be discharged to a dead-end sump, process water treatment system, or sanitary sewer (subject to approval by the City's Industrial Pretreatment Program; call (425) 257-8874), or recycled. Never wash fresh concrete or concrete mixer washout into streets, stormwater drainage systems, streams, or other water bodies.
3. A BMP maintenance schedule must be established, and employees educated about the need to prevent stormwater contamination through the use and proper maintenance of BMPs.

Suggested BMPs

1. The production and pouring area should be swept at the end of each workday to collect loose chunks of aggregate and raw materials for recycling or proper disposal. See BMP S.2 in Chapter 4 for disposal options.
2. All driveways and gutters that show accumulation of materials should be swept to minimize the amount that could be carried offsite by rain and enter the stormwater drainage system.
3. Asphalt plants should use an oil/water separator to treat stormwater runoff. See Volume III of this manual, Flow Control and Treatment, for more information.
4. Production and pouring areas should be protected from stormwater run-on. See BMP S.7 in Chapter 4 for methods of run-on protection.
5. Absorbent materials should be used in and around storm drains and catch basins to filter out contaminants. See Volume III of this manual, Flow Control and Treatment, for more information.

6. The mixing, production, and pouring areas should be paved. A sump drain in these areas is probably not advisable due to potential clogging problems, but could be used in a curing area. Sweep these areas to remove loose aggregate and recycle or dispose of properly.
7. Use storm drain covers or similarly effective containment devices to prevent runoff from entering the stormwater drainage system. Accumulations of dirty runoff must be disposed of properly.

Contact the City's Surface Water Management Section (425) 257-8800 for information about water quality treatment BMPs for these types of operations. Visit Ecology's Web site for accepted water quality treatment at: <http://www.ecy.wa.gov/programs/wq/stormwater/index.html>.

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

A3.2 Concrete Pouring, Concrete Cutting, and Asphalt Application at Temporary Sites

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

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

Pollutant Control Approach: Train employees on proper procedures, sweep or shovel aggregate chunks, collect accumulated runoff and solids, and wash equipment in designated areas.

Required BMPs

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

1. Employees must be educated on the pollution hazards of concrete and asphalt application and cutting.
2. Loose aggregate chunks and dust must be swept or shoveled and collected (not hosed down a storm drain) for recycling or proper disposal at the end of each workday, especially at work sites such as streets, driveways, parking lots, sidewalks, curbs, and gutters where rain can readily pick up the loose material and carry it to the nearest stormwater conveyance. Small amounts of excess concrete, grout, and mortar can be disposed of in the trash.
3. Storm drain covers or similarly effective containment devices must be placed over all nearby drains at the beginning of each day. Shovel or vacuum slurry and remove from the site. All accumulated runoff and solids must be collected and properly disposed of (see BMP S.2 in Chapter 4 for disposal options) at the end of each workday, or more often if necessary.
4. Exposed aggregate washing, where the top layer of unhardened concrete is hosed or scraped off to leave a rough finish, must be done with a mechanism for containment and collection of the discarded concrete slurry (such as the storm drain covers mentioned above). The easiest way to contain the washwater will be to direct the washings to a hole in the ground where the water can percolate into the ground and the solids later covered with soil.
5. Cleaning of concrete application and mixing equipment or concrete vehicles on the work site must be done in a designated area where the rinse water is controlled. The rinse water must either be collected for proper disposal or put into a hole in the ground where the water can percolate away and the solids later covered with soil or recovered and disposed of or recycled.

Suggested BMPs

1. Avoid the activity when rain is occurring or expected.
2. If possible, portable asphalt mixing equipment should be covered by an awning, a lean-to, or another simple structure to avoid contact with rain. See BMP S.4 in Chapter 4 for further details on cover structures.
3. Recycle broken concrete and asphalt. Look under Recycling Services in the Yellow Pages of the phone book to find the nearest recycler.

A3.3 Manufacturing and Post-processing of Metal Products

Description of Pollutant Sources: This activity applies to businesses such as mills, foundries, and fabricators that manufacture or post-process metal products. A variety of activities such as machining, grinding, soldering, cutting, welding, quenching, cooling, and rinsing may take place. These businesses may be required to obtain a NPDES permit from Ecology. See Appendix A for a discussion of NPDES requirements. Note: Painting, finishing and coating of metal products is covered under A3.10 Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment.

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

Pollutant Control Approach: Cover and contain operations and apply good housekeeping and preventive maintenance practices to prevent the contamination of stormwater.

Required BMPs

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

1. Eliminate illicit connections to the stormwater drainage system. See BMP S.1 in Chapter 4 for detailed information on identifying and eliminating illicit connections.
2. Process wastewater (including contact cooling water, filter backwash, cooling tower blow down, etc.) from this activity, and stormwater runoff from activity areas, must discharge to a sanitary sewer, holding tank, or process treatment system that would need an Ecology NPDES permit for discharge to surface water or storm drain. Contact the City's Industrial Pretreatment Program at (425) 257-8874 to obtain permits for discharge to the sewer. See BMP S.3 in Chapter 4 for detailed requirements.
3. Employees must be educated in proper handling to control their work with metal products to minimize pollution.
4. The activity area must be swept at the end of each workday to collect and dispose of metal fragments and product residues properly. See BMP S.2 in Chapter 4 for disposal alternatives.
5. Limit the amount of water used in quenching and rinsing. Recycle used water where possible.
6. Cover the activity area to prevent rain from contacting the process and reduce the amount of runoff that has to be detained or treated. See Activity A3.9.
7. Refer to the BMPs under A2 Transfer of Liquid Materials and A4 Storage and Stockpiling Activities, and utilize those BMPs which are applicable for materials storage and maintenance activities that occur at the site.

A3.4 Wood Treatment Areas

Description of Pollutant Sources: Wood treatment includes both anti-staining and wood preserving using pressure processes or by dipping or spraying. Wood preservatives include creosote, creosote/coal tar, pentachlorophenol, copper naphthenate, arsenic trioxide, malathion, or inorganic arsenicals such as chromated copper arsenate, acid copper chromate, chromate zinc chloride, and fluor-chrome-arsenate-phenol. Anti-staining chemical additives include iodo-prophenyl-butyl carbamate, dimethyl sulfoxide, didecyl dimethyl ammonium chloride, sodium azide, 8-quinolinol, copper (II) chelate, sodium ortho-phenylphenate, 2-(thiocyanomethylthio)-benzothiazole (TCMTB) and methylene bis- (thiocyanate), and zinc naphthenate.

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

Pollutant Control Approach: Cover and contain all wood treating areas and prevent all leaching of and stormwater contamination by wood treating chemicals. All wood treating facilities in Washington State are required to be covered under an Individual NPDES permit.

Required BMPs

1. Dedicate equipment that is used for treatment activities to prevent the tracking of treatment chemicals to other areas on the site.
2. Eliminate non-process traffic on the drip pad. Scrub down non-dedicated lift trucks on the drip pad.
3. Immediately remove and properly dispose of soils with visible surface contamination (green soil) to prevent the spread of chemicals to groundwater and/or surface water via stormwater runoff.
4. If any wood is observed to be contributing chemicals to the environment in the treated wood storage area, relocate it on a concrete chemical containment structure until the surface is clean and until it is drip free and surface dry.
5. Cover and/or enclose, and contain with impervious surfaces, all wood treatment areas. Slope and drain areas around dip tanks, spray booths, retorts, and any other process equipment in a manner that allows return of treatment chemicals to the wood treatment process.
6. Cover storage areas for freshly treated wood to prevent contact of treated wood products with stormwater. Segregate clean stormwater from process water. Ensure that all process water is conveyed to an approved treatment system.
7. Seal any holes or cracks in the asphalt areas that are subject to wood treatment chemical contamination.
8. Elevate stored, treated wood products to prevent contact with stormwater run-on and runoff.
9. Place dipped lumber over the dip tank or on an inclined ramp for a minimum of 30 minutes to allow excess chemical to drip back to the dip tank.
10. Place treated lumber either from dip tanks or retorts in a covered paved storage area for at least 24 hours before placement in outside storage. Use a longer storage period during cold weather unless the temporary storage building is heated. The wood shall be drip free and surface dry before it is moved outside.

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

A3.5 Commercial Composting

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

NPDES Permit Requirements: Discharge of leachate from a compost facility will require a state or NPDES permit from Ecology, depending on the disposal method chosen for managing leachate at the facility. (See Chapter 2 in "Compost Facility Resource Handbook, Guidance for Washington State," November 1998. Publication No. 97-502.) An additional alternative, zero discharge, is possible by containing all leachate from the facility (in tanks or ponds) or preventing production of leachate (by composting under a roof or in an enclosed building).

The Snohomish Health District regulates solid waste facilities in accordance with WAC 173-304. The Snohomish Health District should be contacted at (425) 339-5200 to obtain permits and requirements for composting and recycling facilities.

Pollutant Control Approach: Consider the leachate control specified in publication No. 97-502 or zero leachate discharge.

Required BMPs

1. Ensure that the compost feedstocks do not contain dangerous wastes regulated under Chapter 173-303 WAC or hazardous products of a similar nature or solid wastes that are not beneficial to the composting process. Employees must be trained to screen these materials in incoming wastes.
2. Contact other federal, state, and county agencies with environmental or zoning authority for applicable permit and regulatory information. The Snohomish Health District is responsible for issuing solid waste handling permits for commercial compost facilities.
3. Apply for coverage under the general permit to Discharge Stormwater Associated with Industrial Activities if the facility discharges stormwater to surface water or a municipal stormwater system. If all stormwater from the facility infiltrates into the surrounding area, the general permit is not required.
4. Develop a plan of operations as outlined “Compost Facility Resource Handbook, Guidance for Washington State,” November 1998, publication No. 97-502, for additional design criteria and information.
5. Store finished compost in a manner to prevent contamination of stormwater.
6. Compost pads are required for all uncovered facilities in areas of the state with wet climates (per water quality regulations).
7. Provide curbing for all compost pads to prevent stormwater run-on and leachate run-off.
8. Slope all compost pads sufficiently to direct leachate to the collection device.

9. Provide one or more sumps or catch basins capable of collecting all leachate generated by the design storm and conveying it to the leachate holding structure for all compost pads.
10. Convey all leachate from composting operations to a sanitary sewer, holding tank, or onsite treatment system designed to treat the leachate and total suspended solids. Contact the City's Industrial Pretreatment Program at (425) 257-8874 for permits and information.
11. Ponds used to collect, store, or treat leachate and other contaminated waters associated with the composting process must be lined to prevent groundwater contamination. Apply all known available and reasonable methods of prevention and treatment (AKART) to all pond liners, regardless of the construction materials.
12. Cleanup debris from yard areas regularly.
13. Locate stored residues in areas designed to collect leachate.
14. Limit storage times of residues to prevent degradation and generation of leachate.
15. Consider using leachate as make-up water in early stages of the composting process. Since leachate can contain pathogenic bacteria, care should be taken to avoid contaminating finished product or nearly finished product with leachate.

A3.6 Landscaping and Lawn/Vegetation Management

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

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

Pollutant Control Approach: Control of fertilizer and pesticide applications, soil erosion, and site debris to prevent contamination of stormwater.

Develop and implement an integrated pest management plan and use pesticides only as a last resort. Refer to Appendix D for an example. If pesticides/herbicides are used they must be carefully applied in accordance with label instructions on U.S. EPA registered materials. Maintain appropriate vegetation, with proper fertilizer application where practicable, to control erosion and the discharge of stormwater pollutants. Where practicable, grow plant species appropriate for the site, or adjust the soil properties of the subject site to grow desired plant species.

Required BMPs for Landscaping

1. Do not dispose of collected vegetation into waterways or stormwater drainage systems.
2. Use mulch or other erosion control measures when soils are exposed for more than 1 week during the dry season or 2 days during the rainy season.

3. If oil or other chemicals are handled, store and maintain appropriate oil and chemical spill cleanup materials in readily accessible locations. Ensure that employees are familiar with proper spill cleanup procedures.

Suggested BMPs for Landscaping

1. Conduct mulch-mowing whenever practicable.
2. Install engineered soil/landscape systems to improve the infiltration and regulation of stormwater in landscaped areas.
3. Dispose of grass clippings, leaves, sticks, or other collected vegetation by composting, if feasible.
4. Till fertilizers into the soil rather than dumping or broadcasting onto the surface. Determine the proper fertilizer application for the types of soil and vegetation encountered.
5. Till a topsoil mix or composted organic material into the soil to create a well-mixed transition layer that encourages deeper root systems and drought-resistant plants.
6. Use manual and/or mechanical methods of vegetation removal rather than applying herbicides, where practical.

Required BMPs for the Use of Pesticides

1. Develop and implement an IPM plan (see information on integrated pest management below) and use pesticides only as a last resort.
2. Implement a pesticide-use plan and include at a minimum: a list of selected pesticides and their specific uses; brands, formulations, application methods, and quantities to be used; equipment use and maintenance procedures; safety, storage, and disposal methods; and monitoring, record keeping, and public notice procedures. All procedures shall conform to the requirements of Chapter 17.21 Revised Code of Washington (RCW) and Chapter 16-228 WAC.
3. Choose the least toxic pesticide available that is capable of reducing the infestation to acceptable levels. The pesticide should readily degrade in the environment and/or have properties that strongly bind it to the soil. Any pest control used should be conducted at the life stage when the pest is most vulnerable. For example, if it is necessary to use a Bacillus thuringiensis application to control tent caterpillars, it must be applied before the caterpillars cocoon or it will be ineffective. Any method used should be site-specific and not used wholesale over a wide area.
4. Apply the pesticide according to label directions. Under no conditions shall pesticides be applied in quantities that exceed manufacturer's instructions.
5. Mix the pesticides and clean the application equipment in an area where accidental spills will not enter surface or groundwater, and will not contaminate the soil.
6. Store pesticides in enclosed areas or in covered impervious containment. Ensure that pesticide contaminated stormwater or spills/leaks of pesticides are not discharged to storm drains. Do not hose down paved areas to a storm drain or conveyance ditch. Store and maintain appropriate spill cleanup materials in a location known to all near the storage area.
7. Cleanup any spilled pesticides and ensure that the pesticide contaminated waste materials are kept in designated covered and contained areas.
8. The pesticide application equipment must be capable of immediate shutoff in the event of an emergency.

9. Do not spray pesticides within 100 feet of open waters including wetlands; ponds; and streams, sloughs, and any drainage ditch or channel that leads to open water, except when approved by Ecology or by the City. All sensitive areas including wells, creeks, and wetlands must be flagged prior to spraying.
10. As required by the City or by Ecology, complete public posting of the area to be sprayed prior to the application.
11. Spray applications should only be conducted during weather conditions as specified in the label direction and applicable local and state regulations. Do not apply during rain or immediately before expected rain.

Suggested BMPs for the Use of Pesticides

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

    Note: Installing an amended soil/landscape system can preserve both the plant system and the soil system more effectively. This type of approach provides a soil/landscape system with adequate depth, permeability, and organic matter to sustain itself and continue working as an effective stormwater infiltration system and a sustainable nutrient cycle.
3. Once a pesticide is applied, its effectiveness should be evaluated for possible improvement. Records should be kept showing the applicability and inapplicability of the pesticides considered.
4. An annual evaluation procedure should be developed including a review of the effectiveness of pesticide applications, impact on buffers and sensitive areas (including potable wells), public concerns, and recent toxicological information on pesticides used/proposed for use. If individual or public potable wells are located in the proximity of commercial pesticide applications, contact the regional Ecology hydrogeologist to determine if additional pesticide application control measures are necessary.
5. Rinsing from equipment cleaning and/or triple-rinsing of pesticide containers should be used as product or recycled into product.

For more information, contact the WSU Extension Home-Assist Program at (253) 445-4556; Bio-Integral Resource Center (BIRC), P.O. Box 7414, Berkeley, CA 94707; or Ecology to obtain "Hazardous Waste Pesticides" (publication No. 89-41); contact U.S. EPA to obtain a publication entitled "Suspended, Canceled and Restricted Pesticides" which lists all restricted pesticides and the specific uses that are allowed. Valuable information from these sources may also be available on the Internet.

Suggested BMPs for Vegetation Management

1. Use at least an 8-inch "topsoil" layer with at least 8 percent organic matter to provide a sufficient vegetation-growing medium. Amending existing landscapes and turf systems by increasing the percent organic matter and depth of topsoil can substantially improve the permeability of the soil, improve the disease and drought resistance of the vegetation, and reduce fertilizer demand. This reduces the demand for fertilizers, herbicides, and pesticides. Organic matter is the least water-

soluble form of nutrients that can be added to the soil. Composted organic matter generally releases only between 2 and 10 percent of its total nitrogen annually, and this release corresponds closely to the plant growth cycle. If natural plant debris and mulch are returned to the soil, this system can continue recycling nutrients indefinitely.

2. Select the appropriate turf grass mixture for the climate and soil type. Certain tall fescues and rye grasses resist insect attack because the symbiotic endophytic fungi found naturally in their tissues repel or kill common leaf and stem-eating lawn insects. They do not, however, repel root-feeding lawn pests such as Crane Fly larvae, and are toxic to ruminants such as cattle and sheep. The fungus causes no known adverse effects to the host plant or to humans. Endophytic grasses are commercially available and can be used in areas such as parks or golf courses where grazing does not occur. The local Cooperative Extension office can offer advice on which types of grass are best suited to the area and soil type.
3. Use the following seeding and planting BMPs, or equivalent BMPs, to obtain information on grass mixtures, temporary and permanent seeding procedures, maintenance of a recently planted area, and fertilizer application rates: Temporary Seeding, Mulching, and Matting; Clear Plastic Covering; Permanent Seeding and Planting; and Sodding as described in Volume II, Construction Stormwater Pollution Prevention.
4. Selection of desired plant species can be made by adjusting the soil properties of the subject site. For example, a constructed wetland can be designed to resist the invasion of reed canary grass by layering specific strata of organic matters (e.g., compost forest product residuals) and creating a mildly acidic pH and carbon-rich soil medium. Consult a soil restoration specialist for site-specific conditions.
5. Aerate lawns regularly in areas of heavy use, where the soil tends to become compacted. Aeration should be conducted while the grasses in the lawn are growing most vigorously. Remove layers of thatch greater than 3/4-inch deep.
6. Mowing is a stress-creating activity for turf grass. When grass is mowed too short, its productivity is decreased and there is less growth of roots and rhizomes. The turf becomes less tolerant of environmental stresses, more disease prone, and more reliant on outside means such as pesticides, fertilizers, and irrigation to remain healthy. Set the mowing height at the highest acceptable level and mow at times and intervals designed to minimize stress on the turf. Generally mowing only one-third of the grass blade height will prevent stressing the turf.

Suggested BMPs for Irrigation

1. The depth from which a plant normally extracts water depends on the rooting depth of the plant. Appropriately irrigated lawn grasses normally root in the top 6 to 12 inches of soil; lawns irrigated on a daily basis often root only in the top 1 inch of soil. Improper irrigation can encourage pest problems, leach nutrients, and make a lawn completely dependent on artificial watering. The amount of water applied depends on the normal rooting depth of the turf grass species used, the available water holding capacity of the soil, and the efficiency of the irrigation system. Consult with the Snohomish Conservation District, or WSU Cooperative Extension office to help determine optimum irrigation practices.

Suggested BMPs for Fertilizer Management

1. Turf grass is most responsive to nitrogen fertilization, followed by potassium and phosphorus. Fertilization needs vary by site depending on plant, soil, and climatic conditions. Evaluation of soil nutrient levels through regular testing ensures the best possible efficiency and economy of

fertilization. For details on soils testing, contact the Snohomish Conservation District or Cooperative Extension Service.

2. Fertilizers should be applied in amounts appropriate for the target vegetation and at the time of year that minimizes losses to surface and groundwater. Do not fertilize during a drought or when the soil is dry. Alternatively, do not apply fertilizers within 3 days prior to predicted rainfall. The longer the period between fertilizer application and either rainfall or irrigation, the less fertilizer runoff occurs.
3. Use slow release fertilizers such as methylene urea, IDBU, or resin coated fertilizers when appropriate, generally in the spring. Use of slow release fertilizers is especially important in areas with sandy or gravelly soils.
4. Time the fertilizer application to periods of maximum plant uptake. Generally fall and spring applications are recommended, although WSU turf specialists recommend four fertilizer applications per year.
5. Properly trained persons should apply all fertilizers. At commercial and industrial facilities, fertilizers should not be applied to grass swales, filter strips, or buffer areas that drain to sensitive water bodies unless approved by the City.

Suggested BMPs for IPM

An integrated pest management program might consist of the following steps:

Step 1 Correctly identify problem pests and understand their life cycle.

Step 2 Establish tolerance thresholds for pests.

Step 3 Monitor to detect and prevent pest problems.

Step 4 Modify the maintenance program to promote healthy plants and discourage pests.

Step 5 Use cultural, physical, mechanical, or biological controls first if pests exceed the tolerance thresholds.

Step 6 Evaluate and record the effectiveness of the control and modify maintenance practices to support lawn or landscape recovery and prevent recurrence.

For an elaboration of these steps refer to Appendix D, Example of an IPM Program.

A3.7 Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment

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

Pollutant Control Approach: Cover and contain painting and sanding operations and apply good housekeeping and preventive maintenance practices to prevent the contamination of stormwater with painting overspray and grit from sanding.

Required BMPs

1. Train employees in the careful application of paints, finishes, and coatings to reduce misuse and overspray. Use ground or drop cloths underneath outdoor painting, scraping, sandblasting work, and properly clean and temporarily store collected debris daily.
2. Do not conduct spraying, blasting, or sanding activities over open water or where wind may blow paint or waste into water.

3. Wipe up spills with rags and other absorbent materials immediately. Do not hose down the area to a storm drain, receiving water, or conveyance ditch to receiving water.
4. On marine dock areas, sweep rather than hose down debris. Collect any hose water generated and convey to appropriate treatment and disposal.
5. Use a storm drain cover, filter fabric, or similarly effective runoff control device if dust, grit, washwater, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the workday. Collect contaminated runoff and solids and properly dispose of such wastes before removing the containment device(s) at the end of the workday.
6. Use a ground cloth, pail, drum, drip pan, tarpaulin, or other protective device for activities such as paint mixing and tool cleaning outside or where spills can contaminate stormwater.
7. Properly dispose of all wastes and prevent all uncontrolled releases to the air, ground, or water.
8. Clean brushes and tools covered with non-water-based paints, finishes, or other materials in a manner that allows collection of used solvents (e.g., paint thinner, turpentine, xylol, etc.) for recycling or proper disposal.
9. Store toxic materials under cover (tarpaulin, etc.) during precipitation events and when not in use to prevent contact with stormwater.
10. Enclose and/or contain all work while using a spray gun or conducting sand blasting and in compliance with applicable Puget Sound Air Pollution Control Agency Air Quality (PSAPCA), Occupational Safety and Health Administration (OSHA), and Washington Industrial Safety and Health Act (WISHA) requirements. Do not conduct outside spraying, grit blasting, or sanding activities during windy conditions which render containment ineffective.

Suggested BMPs

1. Conduct incidental cleaning of paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain.
2. Recycle paint, paint thinner, solvents, pressure washwater, and any other recyclable materials.
3. Use efficient spray equipment such as electrostatic, air-atomized, high volume/low pressure, or gravity feed spray equipment.
4. Purchase recycled paints, paint thinner, solvents, and other products if feasible.

A3.8 Commercial Printing Operations

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

Pollutant Control Approach: Ensure appropriate disposal and NPDES permitting of process wastes. Cover and contain stored raw and waste materials.

Required BMPs

1. Discharge process wastewaters to a sanitary sewer (if approved by the City's Industrial Pretreatment Program, (425) 257-8874) or to an approved process wastewater treatment system.
2. Do not discharge process wastes or wastewaters into storm drains or surface water.
3. Determine whether any of these wastes qualify for regulation as dangerous wastes and dispose of them accordingly.
4. Store raw materials or waste materials that could contaminate stormwater in covered and contained areas.

Suggested BMPs

1. Train all employees in pollution prevention, spill response, and environmentally acceptable materials handling procedures.
2. Store materials in proper, appropriately labeled containers. Identify and label all chemical substances.
3. All stormwater management devices should be inspected regularly and maintained as necessary.
4. Try to use press washes without listed solvents, and with the lowest VOC content possible. Don't evaporate ink cleanup trays to the outside atmosphere.
5. Place cleanup sludges into a container with a tight lid and dispose of as hazardous waste. Do not dispose of cleanup sludges in the garbage or in containers of soiled towels.
6. For additional information on pollution prevention the following Ecology publications are recommended: A Guide for Screen Printers, publication No. 94-137 and A Guide for Lithographic Printers, publication No. 94-139.

A3.9 Manufacturing Operations (Outside)

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

Pollution Control Approach: Cover and contain outside manufacturing and prevent stormwater run-on and contamination, where feasible.

Required BMPs

1. Sweep paved areas regularly, as needed, to prevent contamination of stormwater.
2. Eliminate or minimize the contamination of stormwater by altering the activity.
3. Enclose the activity. If possible, enclose the manufacturing activity in a building.
4. Cover the activity and connect floor drains to a sanitary sewer, if approved by the City's Industrial Pretreatment Program (425) 257-8874. Berm or slope the floor as needed to prevent drainage of pollutants to outside areas.
5. Isolate and segregate pollutants, as feasible. Convey the segregated pollutants to a sanitary sewer, process treatment, or dead-end sump, depending on available methods and applicable permit requirements.

A3.10 Agricultural Crop Production

This activity applies to farming of crops on a commercial scale. Crop farming practices can cause a large variety of pollution problems in receiving waters. Many of these practices can be altered without adversely affecting the farmers' ability to produce the same crops.

One of the most effective BMPs for stormwater pollution prevention the farmer can pursue is to contact the Snohomish Conservation District at (425) 335-5634. They will help develop a farm plan that covers all aspects of the farming operation, with particular care and attention to soil conservation and water resource protection. They also have access to grants to pay for conservation plantings and stream corridor fencing.

Pollutants of Concern: Toxic organic compounds, oils, heavy metals, nutrients, Biochemical oxygen demand (BOD), suspended solids (e.g., sediments), fecal bacteria.

Crop farms should implement agricultural practices proven to limit erosion. Several farming techniques aimed at reducing erosion have been proven successful. Individual farms should implement the combination of the following BMPs that best suits conditions present:

Suggested BMPs

1. Maintain ground cover. Cover bare areas with material such as mulch or green manure during times when land is not in production.
2. Practice conservation tillage. Implement tillage or planting systems in which at least 30 percent of the soil surface is covered by plant residue after planting.
3. Practice conservation cover. Establish and maintain perennial vegetation cover to protect soil and water resources on land retired from agricultural production.
4. Utilize contour farming. Plow, prepare, plant and cultivate land on contours perpendicular to the slope of the land in a terrace-like fashion, so that runoff cannot proceed directly along a row but rather is impeded by rows in its path, thus allowing for more infiltration.
5. Plant critical areas. Plant vegetation such as trees, shrubs, vines, grasses, and legumes on highly erodible or critical areas to stabilize the soil.
6. Plant and maintain vegetated buffers and filter strips. Maintain a strip of permanent vegetation downslope of crop fields so that sediments and associated pollutants in surface water runoff can be filtered out. These filter strips are especially important along stream banks, shorelines, and drainage ditches. Contact the Snohomish Conservation District at (425) 335-5634 and the Natural Resources Conservation Service at (425) 334-2828 for more information. In some instances, these organizations may be able to provide plant materials for such work free or for a low cost.
7. Practice conservation irrigation. Replace flood irrigation systems with sprinkler head or drip irrigation systems that use less water. These irrigation methods reduce the amount of crop field runoff and thereby reduce erosion and pollutant transport.
8. Use an IPM plan and reduce reliance on pesticides. Information on integrated pest management is available from the Washington State University/County Cooperative Extension Service. BMP S.8 in Chapter 4 provides some details on integrated pest management and Appendix D provides an example. See Activity 3.6 for information on BMPs for pesticide and fertilizer use.
9. If possible, crops should be planted as far as possible from surface drainages. This will help keep nutrients from fertilizers out of water bodies.

10. Contact the Natural Resources Conservation Service (formerly the Soil Conservation Service) at (425) 334-2828 for information on developing specific fertilization schedules. Applying fertilizers at the right time and in the right quantity can help minimize pollution.
11. If possible, crop cultivation should be avoided on steep slopes.

A3.11 Application of Pesticides, Herbicides, Fungicides, and Rodenticides for Purposes Other than Landscaping

This activity applies to businesses and government agencies using pesticides, herbicides, fungicides and rodenticides for purposes such as removing moss from rooftops or decks, killing nuisance rodents and some insects (such as termites and carpenter ants) that live outdoors but can invade the home if left unchecked. Businesses and government agencies involved in these activities must comply with Snohomish Health District regulations and Washington State Department of Agriculture pesticide regulations. See Appendix A for more information on these regulations. The BMPs listed are intended to complement other regulations. Application of pesticides for landscaping purposes must follow the BMPs discussed under **A3.6 Landscaping and Lawn/Vegetation Management.**

Pollutants of Concern: Toxic organic compounds, oils, heavy metals, Chemical oxygen demand (COD)

Required BMPs

The following BMPs or equivalent measures are required of all businesses and agencies applying pesticides, herbicides, fungicides and rodenticides for non-landscaping purposes:

1. Proper application practices must be used to avoid excessive application. Follow the manufacturers' guidelines and directions carefully.
2. Never apply pesticides, herbicides, fungicides or rodenticides when rain is expected, or during rain events.
3. Do not apply chemicals when it is windy. Early morning is typically the calmest time of day.
4. Employees must be educated regarding the pollution potential of misusing the chemicals they are working with.
5. Manage residues properly. Triple rinse or pressure rinse empty containers and mixing and application equipment. Collect all rinse water, and use it for diluting the next batch.

Suggested BMPs

1. Use manual pest control measures, such as scraping or using high-pressure sprayers to remove moss from roofs and decks, before resorting to chemicals. Rodent traps can also be highly effective, without endangering pets and children as chemical baits can.
2. IPM is a comprehensive approach to the use of pesticides. Integrated pest management minimizes pesticide application and stresses selection of proper products and tailored application rates. It is a sensible long-term strategy rather than a hit-and-run operation, and as such is probably the most effective BMP measure that can be utilized under this activity. See BMP S.8 in Chapter 4 for more details on integrated pest management and Appendix D for an example.

3.3.4 Activity Code A4 - Storage and Stockpiling Activities

A4.1 Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products

Description of Pollutant Sources: Solid raw materials, by-products, or products such as gravel, sand, salts, topsoil, compost, logs, sawdust, wood chips, lumber and other building materials, concrete, and metal products sometimes are typically stored outside in large piles, stacks, etc. at commercial or industrial establishments. Bulk materials stored outside may leach or erode when contacted by stormwater. Contaminants include total suspended solids, BOD, organics, and dissolved salts (sodium, calcium, magnesium chloride, etc).

Pollutant Control Approach: Provide impervious containment with berms, dikes, etc. and/or cover to prevent run-on and discharge of leachate pollutant(s) and total suspended solids.

Required BMPs

1. Do not hose down the contained stockpile area to a storm drain or a conveyance to a storm drain or receiving water.
2. Choose one or more of the source control BMP options listed below for stockpiles greater than 5 cubic yards of erodible or water soluble materials such as soil, road de-icing salts, compost, unwashed sand and gravel, sawdust, etc. Also included are outside storage areas for solid materials such as logs, bark, lumber, metal products, etc.:
    a. Store in a building or paved and bermed covered
    b. Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material; or
    c. Pave the area and install a stormwater drainage system. Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater (e.g., pooling) and leachable materials in compost, logs, bark, wood chips, etc.
3. For large stockpiles that cannot be covered, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material offsite or to a storm drain. Ensure that contaminated stormwater is not discharged directly to catch basins without being conveyed through a treatment BMP.
4. Convey contaminated stormwater from the stockpile area to a wet pond, wet vault, settling basin, media filter, or other appropriate treatment system, depending on the contamination.

Suggested BMPs

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

A4.2 Storage and Treatment of Contaminated Soils

Description of Pollutant Sources: This activity applies to businesses and agencies that store and treat soils contaminated with toxic organic compounds, petroleum products, or heavy metals. Such contamination typically comes to light when an environmental audit is done or old underground tanks are removed. The soils are usually excavated and taken off site for treatment via aeration and perhaps chemical stabilization. Stormwater runoff that comes in contact with contaminated soil can carry those contaminants along with loose dirt into receiving waters.

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

Pollutant Control Approach: The Snohomish Health District at (425) 339-5200 regulates and permits businesses treating contaminated soil. In addition, a permit from the Puget Sound Clean Air Agency is required if the treatment method for removing soil contaminants involves forcing air through, or extracting air from, the soil. Contact these agencies for additional information regarding the appropriate pollutant control approach.

Required BMPs

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

1. The storage area for contaminated soils must be enclosed indoors or covered, and contained by a curb, dike, or berm constructed around the material storage area. If the contaminated soils are covered, stormwater run-on protection must also be provided. BMP S.7 in Chapter 4 provides further details on containment and run-on prevention.
2. Employees must be educated on methods to prevent contamination from leaving the site.
3. Cleanup materials must be stocked near the storage area.
4. Gutters, storm drains, catch basins, and other drainage system features on the site must be cleaned following the completion of site work, or at least once per year, whichever comes first. Sediments from such cleaning must be disposed of properly. See BMPs S.9 and S.2 in Chapter 4 for details on catch basin cleaning and disposal options.

A4.3 Temporary Storage or Processing of Fruits or Vegetables

Description of Pollutant Sources: This activity applies to businesses that temporarily store fruits and vegetables outdoors prior to processing or sale, or that crush, cut, or shred fruits or vegetables for wines, frozen juices, and other food and beverage products. Nutrients and soil washing off of fruit can have a detrimental effect on receiving waters.

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

Pollutant Control Approach: Store and process fruits and vegetables indoors or under cover whenever possible. Educate employees about proper procedures. Eliminate illicit connections to the stormwater drainage system. Cover and contain operations and apply good housekeeping and preventive maintenance practices to prevent the contamination of stormwater.

Required BMPs

The following BMPs or equivalent measures are required of all businesses engaged in *storage* of fruits or vegetables:

1. Illicit connections to the stormwater drainage system must be eliminated. See BMP S.1 in Chapter 4 for details on detecting and eliminating these connections.
2. Employees must be educated on benefits of keeping a clean storage area.

3. No untreated water used to clean produce can enter the stormwater drainage system. Minimize the use of water when cleaning produce to avoid excess runoff.
4. Cleanup materials, such as brooms and dustpans, must be kept near the storage area.
5. Gutters, storm drains, and catch basins on the property must be cleaned as needed. See BMP S.9 in Chapter 4 for details on catch basin cleaning requirements.

The following BMPs or equivalent measures are required of all businesses that *process* fruits or vegetables:

1. Eliminate illicit connections to the stormwater drainage system. See BMP S.1 in Chapter 4 for details on detecting and eliminating these connections.
2. Employees must be educated on benefits of keeping a clean processing area.
3. Cleanup materials, such as brooms, dustpans, and shovels, must be kept near the storage area.
4. The processing area must be swept or shoveled daily to collect dirt and fruit and vegetable fragments for proper disposal.
5. The processing area must be enclosed in a building or shed, or covered with provisions for stormwater run-on prevention. See BMPs S.4, S.5, and S.7 in Chapter 4 for more on covering and run-on prevention, OR

   The processing area must be paved and sloped to a sanitary sewer drain, holding tank, or process treatment system collection drain, and stormwater run-on prevention must be provided for the processing area. Call the City's Industrial Pretreatment Program (425) 257-8874 for information on discharging to the sanitary sewer. See BMPs S.6 and S.3 in Chapter 4 for details.

Suggested BMPs

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

1. Cover storage areas for fruits and vegetables. See BMPs S.4 and S.5 in Chapter 4 for more details on coverings.
2. A containment curb, dike, or berm can be used to prevent offsite runoff from storage or processing areas and also to prevent stormwater run-on. See BMP S.7 in Chapter 4 for more information. Note that run-on prevention is required for processing areas, but not for storage areas.
3. The storage area should be swept or shoveled daily to collect dirt and fruit and vegetable fragments for proper disposal. Keep hosing to a minimum.

A4.4 Storage of Solid Wastes and Food Wastes

Description of Pollutant Sources: This activity applies to businesses and public agencies that store solid wastes and food wastes outdoors. This includes ordinary garbage. If improperly stored, these wastes can contribute a variety of different pollutants to stormwater. Requirements for handling and storing solid waste may include a permit from the Snohomish Health District. For more information, call (425) 339-5200.

NOTE: Dangerous solid wastes must be stored and handled under special guidelines. Businesses and agencies that store dangerous wastes must follow specific regulations outlined by Ecology and, in some cases, the Snohomish Health District. Ecology regulations are outlined in Appendix A. Please contact Ecology at (425) 649-7000 and the Snohomish Health District at (425) 339-5200 for the specific requirements and permitting information.

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

Pollutant Control Approach: Store wastes in suitable containers with leak-proof lids. Sweep or shovel loose solids. Educate employees about the need to check for and replace leaking containers.

Required BMPs

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

1. All solid and food wastes must be stored in suitable containers. Piling of wastes without any cover is not acceptable.
2. Storage containers must be checked for leaks and replaced if they are leaking, corroded, or otherwise deteriorating.
3. Storage containers must have leak-proof lids or be covered by some other means. Lids or covered must be kept closed at all times except when material is being placed in the storage container. This is especially important for dumpsters, as birds can pick out garbage and drop it, promoting rodent, health, and stormwater problems, OR

   If lids cannot be provided for the waste containers, or they cannot otherwise be covered, a designated waste storage area must be provided. The designated waste storage area shall have a containment berm, dike, or curb, and the designated area must drain to a sanitary sewer (contact the City's Industrial Pretreatment Program at (425) 257-8874 prior to any connections) or holding tank for further treatment. See BMP S.7 and S.3 in Chapter 4 for more information.
4. Employees must be trained to frequently check storage containers for leaks and to ensure that the lids are on tightly.
5. The waste storage area must be swept or otherwise cleaned frequently to collect all loose solids for proper disposal in a storage container. Do not hose the area to collect or clean solids.
6. If containers are cleaned, all rinse water from cleaning must be disposed of in a sanitary sewer, process treatment, or dead-end sump with appropriate disposal at a later date.
7. Catch basins on the property that receive drainage from the waste storage area shall be cleaned out. See BMP S.9 in Chapter 4 of this volume for details on catch basin cleaning.

Suggested BMPs

1. If the amount of waste accumulated frequently exceeds the capacity of the storage container, then another storage container must be obtained and utilized.
2. Store containers such that wind will not be able to knock them over.
3. Designate a storage area, pave the area, and slope the drainage to a holding tank to prevent stormwater run-on or run-off. If a holding tank is used, the contents must be pumped out before the tank is full and properly disposed of. See BMP S.2 in Chapter 4 of this volume for more information on disposal options.
4. Compost appropriate wastes. Contact the City at (425) 257-8800 for more information on composting.
5. Recycle solid wastes. The Industrial Materials Exchange program facilitates the transfer of excess materials and wastes to those who can use them. Industrial Materials Exchange can be reached at (206) 296-4899, toll free 1-888-TRY-IMEX or on the Web at:
   <www.govlink.org/hazwaste/business/imex/index.html>.

A4.5 Recyclers and Scrap Yards

Description of Pollutant Sources This activity applies to businesses and public agencies that salvage and store scrap metal, scrap equipment, junk appliances and vehicles, empty metal drums, and recyclable items such as cans, bottles, paper products construction materials, metals, and beverage containers. This does not apply to businesses and agencies that store these items for less than 2 weeks. Businesses engaged in these activities may be required to obtain an NPDES permit for stormwater discharges from Ecology. See the discussion of NPDES requirements in Appendix A for more information. For these permit holders, the BMPs listed below should be used to complement NPDES requirements.

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

Potential pollutants typically found at these facilities include: toxic hydrocarbons, polychlorinated biphenyls (PCBs), other toxic organic compounds, heavy metals, oils and greases, suspended solids, Biochemical oxygen demand (BOD), Chemical oxygen demand (COD), ethylene and propylene glycol, and acidic pH.

Required BMPs

For facilities subject to Ecology's industrial stormwater general permit refer to BMP Guidance Document No. 94-146, "Best Management Practices to Prevent Stormwater Pollution at Vehicle Recycler Facilities," Ecology, September 1994 for selection of BMPs. The BMPs in that guidance document can also be applied to scrap material recycling facilities (depending on the pollutant sources existing at those facilities) and to non-permitted facilities.

1. Gasoline, engine fluids, freon and other contaminated liquids must be drained from scrapped items in a designated area and disposed of or recycled properly before the items are placed in the scrap storage area. See BMP S.2 in Chapter 4 for acceptable disposal options. The designated fluid draining area must be covered and paved, or if not covered, must be paved and sloped to a drain and holding tank. See BMP S.3 in Chapter 4 for drainage alternatives. Batteries must also be removed and recycled properly prior to storage.
2. Employees must be educated about the need for stormwater pollution protection, and proper maintenance of BMPs. They also must have training in spill cleanup procedures, and appropriate cleanup materials must be stocked near the fluid draining area.
3. Catch basins on the property must be cleaned as needed. See BMP S.9 in Chapter 4 for more details.
4. If the storage area is small, the scrap or recycling materials must be covered. See BMPs S.4 and S.5 in Chapter 4 for further details on coverings; OR

   If the storage area cannot be covered, a stormwater treatment system consisting of a wet pond/vault, infiltration basin with underdrains, filtration system, or vegetated biofilter preceded by an oil/water separator must be provided to treat runoff from the entire material storage area.

Suggested BMPs

1. The material storage area can be paved and sloped to a drain and holding tank. See BMP S.6 in Chapter 4 for details on this drainage strategy.

2. Use of a containment dike, curb, or berm can help prevent contaminated runoff from leaving the site, and can function to direct runoff to one of the treatment methods mentioned under the Required BMPs. See BMP S.7 in Chapter 4 for more details.
3. Chemical addition can be used to enhance settling or adjust pH in a wet pond/vault or filtration system

A4.6 Treatment, Storage, or Disposal of Dangerous Wastes

This activity applies to businesses and public agencies that are permitted by Ecology to treat, store, or dispose of dangerous wastes. DOE regulates these facilities with specific requirements, which include the need for a NPDES permit. Detailed BMPs are not included in this volume since site requirements for these facilities are well beyond the level of typical BMP applications. See Appendix A for reference information.

The Snohomish Health District also administers some aspects of dangerous waste treatment, storage, and disposal. Call (425) 339-5200 for more information.

A4.7 Storage of Liquid or Dangerous Waste Containers

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

Pollutant Control Approach: Store containers in impervious containment under a roof or other appropriate cover, or in a building. For roll-containers (for example, dumpsters) that are picked up directly by the collection truck, a filet can be placed on both sides of the curb to facilitate moving the dumpster. If a storage area is to be used on site for less than 30 days, a portable temporary secondary system can be used in lieu of a permanent system as described above.

Required BMPs

1. Place tight-fitting lids on all containers.
2. Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
3. Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers daily for leaks/spills. Replace containers, and replace and tighten bungs in drums, as needed.
4. Businesses accumulating Dangerous Wastes that do not contain free liquids need only to store these wastes in a sloped designated area with the containers elevated or otherwise protected from stormwater run-on.
5. Drums stored in an area where unauthorized persons may gain access must be secured in a manner that prevents accidental spillage, pilferage, or any unauthorized use.
6. If the material is a Dangerous Waste, the business owner must comply with any additional Ecology requirements as specified in Appendix A.
7. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code.

8. Cover dumpsters or keep them under cover, such as a lean-to, to prevent the entry of stormwater. Replace or repair leaking garbage dumpsters.
9. Drain dumpsters and/or dumpster pads to sanitary sewer. Dumpster drains must not discharge to stormwater systems. Keep dumpster lids closed. Install waterproof liners.
10. Keep containers with Dangerous Waste, food waste, or other potential pollutant liquids inside a building unless this is impracticable due to site constraints or Uniform Fire Code requirements.
11. Store containers in a designated area that is covered, bermed, or diked; paved; and impervious in order to contain leaks and spills. The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.
12. For liquid wastes, surround the containers with a dike. The dike must be of sufficient height to provide a volume of 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater, or, if a single container, 110 percent of the volume of that container.
13. Where material is temporarily stored in drums, a containment system can be used, as illustrated, in lieu of the above system.
14. Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer.
15. For contaminated stormwater in the containment area, connect the sump outlet to a sanitary sewer, if approved by the City's Industrial Pretreatment Program at (425) 257-8874, or to appropriate treatment such as an API or coalescent plate oil/water separator, or other appropriate system (see Volume III). Equip the sump outlet with a normally closed valve to prevent the release of spilled or leaked liquids, especially flammables (in compliance with Fire Codes), and dangerous liquids. This valve may be opened only for the conveyance of contaminated stormwater to treatment.
16. Another option for discharge of contaminated stormwater is to pump it from a dead-end sump or catchment to a tank truck or other appropriate vehicle for offsite treatment and/or disposal.

A4.8 Storage of Liquids in Permanent Aboveground Tanks

Description of Pollutant Sources: Aboveground tanks containing liquids (excluding uncontaminated water) may be equipped with a valved drain, vent, pump, and bottom hose connection. They may be heated with steam heat exchangers equipped with steam traps. Leaks and spills can occur at connections and during liquid transfer. Oil and grease, organics, acids, alkalis, and heavy metals in tank water and condensate drainage can also cause stormwater contamination at storage tanks.

Pollutant Control Approach: Install secondary containment or a double-walled tank. Slope the containment area to a drain with a sump. Stormwater collected in the containment area may need to be discharged to treatment such as an **API** or **coalescing plate** oil/water separator, or equivalent BMP. Add safeguards against accidental releases including protective guards around tanks to protect against vehicle or forklift damage, and tag valves to reduce human error. *Tank water and condensate discharges are process wastewater that may need an NPDES permit.*

Required BMPs

1. Inspect the tank containment areas regularly to identify problem components such as fittings, pipe connections, and valves for leaks/spills, cracks, corrosion, etc.

2. Place adequately sized drip pans beneath all mounted taps and drip/spill locations during filling/unloading of tanks. Valved drain tubing may be needed in mounted drip pans.
3. Sweep and clean the tank storage area regularly, if paved.
4. Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
5. All installations shall comply with the Uniform Fire Code and the National Electric Code.
6. Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes, or Underwriters Laboratory approved double-walled. The dike must be of sufficient height to provide a containment volume of 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank, whichever is greater, or, if a single tank, 110 percent of the volume of that tank.
7. Slope the secondary containment to drain to a dead-end sump (optional), or equivalent, for the collection of small spills.
8. Include a tank overfill protection system to minimize the risk of spillage during loading.
9. If the tank containment area is uncovered, equip the outlet from the spill-containment sump with a shutoff valve, which is normally closed and may be opened, manually or automatically, only to convey contaminated stormwater to approved treatment or disposal or convey uncontaminated stormwater to a storm drain. Evidence of contamination can include the presence of visible sheen, color, or turbidity in the runoff, or existing or historical operational problems at the facility. Simple pH measurements with litmus or pH paper can be used for areas subject to acid or alkaline contamination.
10. At petroleum tank farms, convey stormwater contaminated with floating oil or debris in the contained area through an API or coalescent plate type oil/water separator (Volume III, Treatment BMPs) or other approved treatment prior to discharge to storm drain or surface water.

A4.9 Parking and Storage for Vehicles and Equipment

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

Required BMPs

1. If washing of a parking lot is conducted, the washwater shall be discharged to a sanitary sewer (if allowed by the City's Industrial Pretreatment Program at (425) 257-8874) or other approved wastewater treatment system, or collected for offsite disposal.
2. The area shall not be hosed down to a storm drain or receiving water. Parking lots, storage areas, and driveways shall be swept regularly to collect dirt, waste, and debris.
3. An oil removal system such as an API or coalescing plate oil and water separator, or equivalent BMP (see Volume III), approved by the City , is applicable for parking lots meeting the threshold vehicle traffic intensity level of a high-use site. For more information on high-use sites, refer to Volume I, Chapter 4.3.

A4.10 Storage of Pesticides, Fertilizers, or Other Products That Can Leach Pollutants

This activity applies to businesses, public agencies and farms that store non-liquid pesticides, fertilizers, or a variety of other products, such as treated lumber, metal building materials, and metal tools, that have the potential to leach pollutants into underlying soil or stormwater runoff. The main problem with the

potential pollutants from these sources is their solubility, which means they are difficult or impossible to filter out of runoff. If there is any question as to whether materials on the site have the potential to leach pollutants into stormwater runoff or underlying soil, call the City's Surface Water Management Section at (425) 257-8800 and ask to speak to a water quality person. Note that the storage of liquid pesticides is covered under activity A4.7 Storage of liquid chemicals, waste oils, solvents or petroleum products in portable containers.

Pollutants of Concern: Toxic organic compounds, oils, heavy metals, chemical oxygen demand (COD), nutrients, fecal bacteria, biochemical oxygen demand (BOD), suspended solids.

Required BMPs

The following BMPs or equivalent measures are required of all businesses, public agencies and farms engaged in storage of pesticides, fertilizers or finished products that can leach pollutants:

1. Employees must be trained on the proper storage, handling, application and disposal of fertilizers and pesticides, from keeping bags intact to storing in a covered or contained area.
2. Outdated or banned pesticides must be disposed of at an approved hazardous waste facility. Do not hose storage areas to a storm drain or conveyance ditch.
3. Contained storage areas must drain to a sump or a holding tank. Note that this only applies to finished products other than treated lumber. The sump must be cleaned at least once per year, and solid materials and residues collected in the bottom of the sump must be properly disposed of. See BMP S.2 in Chapter 4 for information on disposal options.
4. Storage areas for pesticides, fertilizers, and finished products that can leach pollutants must be covered. See BMPs S.4 and S.5 in Chapter 4 for further information on coverings. Stormwater runon prevention must be provided for the covered area, or the stored materials must be raised off the ground. See BMP S.7 in Chapter 4 for more information on runon prevention options.
5. Storage areas for treated lumber should be paved, and either covered or sloped to drain to a dead-end sump or treatment system. Material collected from the sump must be disposed of as a hazardous waste (it may be economical to install an evaporation system for the uncovered area). Stormwater runon must be prevented from entering the covered area if the lumber is not elevated off the ground. See BMPs S.4 and S.7 in Chapter 4 for more information on roof covers and runon prevention.

Suggested BMPs

1. Paved storage areas for finished products should be swept weekly and collected materials disposed of properly. Small amounts of fertilizers can be disposed of in the regular garbage after double wrapping in plastic.
2. Less pesticide or fertilizer should be used, or less finished product stored, so that the size of the designated storage areas can be smaller and stormwater contamination potential is reduced.

3.3.5 Activity Code A5 - Construction and Demolition Activities

A5.1 Demolition of Buildings

Description of Pollutant Sources: This activity applies to removal of existing buildings by controlled explosions, wrecking balls, or manual methods, and subsequent clearing of the rubble. The loose debris can contaminate stormwater.

Pollutants of concern include toxic organic compounds, heavy metals, and suspended solids.

Pollutant Control Approach: Regularly cleanup debris that can contaminate stormwater. Protect the stormwater drainage system from dirty runoff and loose particles. Sweep paved surfaces daily.

Required BMPs

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

1. Storm drain covers or a similarly effective containment device must be placed on all nearby drains to prevent dirty runoff and loose particles from entering the stormwater drainage system. Covers shall be placed at the beginning of the workday and the accumulated materials collected and disposed of before removing the covers at the end of the workday. If storm drains are not present, dikes, berms, or other methods must be used to protect overland discharge paths from runoff. See BMPs S.2 and S.7 in Chapter 4 for more information on runoff control and disposal options. Street gutters, sidewalks, driveways, and other paved surfaces in the immediate area of the demolition must be swept at the end of each workday to collect and properly dispose of loose debris and garbage.
2. Check with the City's Building Department (425) 257-8810 to obtain required permits.

Suggested BMPs

1. Water should be sprayed throughout the site to help control wind blowing of fine materials such as soil, concrete dust, and paint chips. The amount of water must be controlled so that runoff from the site does not occur, yet dust control is achieved. Oils must never be used for dust control.
2. If possible, a wall should be constructed to prevent stray building materials and dust from escaping the area during demolition.
3. Schedule demolition to take place at a dry time of the year.

A5.2 Building Repair, Remodeling, Painting, and Construction

Description of Pollutant Sources: This activity refers to activities associated with construction of buildings and other structures, remodeling of existing buildings and houses, and general exterior building repair work. Concrete pouring is covered under **A3.2 Concrete Pouring and Asphalt Application at Temporary Sites**.

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

Pollutant Control Approach: Employees must be educated about the need to control site activities. Control leaks, spills, and loose material. Utilize good housekeeping practices.

Required BMPs

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

1. Employees must be educated about the need to control site activities to prevent stormwater pollution, and also trained in spill cleanup procedures.
2. Spill cleanup materials, appropriate to the chemicals being used on site, must be available at the work site at all times.
3. The work site must be cleaned up at the end of each workday, with materials such as solvents put away indoors or covered and secured so that vandals will not have access to them.
4. The area must be swept daily to collect loose litter, paint chips, grit, and dirt.
5. Absolutely no substance can be dumped on pavement, on the ground, or in or toward storm drains, regardless of its content, unless it is water only.
6. For wood treating activities drop cloths must be placed where space and access permit before the work begins. Additional drip pans must be used in areas where drips are likely to occur that cannot be protected with a drop cloth.
7. Ground or drop cloths must be used underneath scraping, sandblasting work. Ground cloths, buckets, or tubs must also be used anywhere that work materials are laid down.
8. Incidental cleaning of paint brushes and other tools that are covered with water-based paints must be cleaned 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 finishes or other materials must be cleaned in a manner that enables collection of used solvents for recycling or proper disposal and cannot be discharged to the sanitary sewer. See BMP S.2 in Chapter 4 for disposal options.
9. Storm drain covers or similarly effective devices must be used if dust, grit, washwater, or other pollutants may escape the work area. This is particularly necessary on rainy days. The cover or containment device shall be placed over the storm drain at the beginning of the workday, and accumulated dirty runoff and solids must be collected and disposed of before removing the cover at the end of the day.

Suggested BMPs

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

1. Materials should be recycled whenever possible.
2. Light spraying of water on the work site can control some of the dust and grit that can blow away. Oils must never be used for dust control. Never spray to the point of runoff from the site.
3. Activities such as tool cleaning should occur over a ground cloth or within a containment device such as a tub.

3.3.6 Activity Code A6 - Dust Control and Soil and Sediment Control

A6.1 Dust Control at Disturbed Land Areas and Unpaved Driving and Parking Areas

Description of Pollutant Sources: Dust can cause air and water pollution problems particularly at demolition sites, disturbed land areas, and unpaved driving and parking areas.

Pollutant Control Approach: Minimize dust generation and apply environmentally friendly and government approved dust suppressant chemicals, if necessary.

Required BMPs

1. Sprinkle or wet down soil or dust with water as long as it does not result in a wastewater discharge.
2. Only local and/or state government approved dust suppressant chemicals shall be used, such as those listed in Ecology publication No. 96-433, "Techniques for Dust Prevention and Suppression." See BMP C126, Polyacrylamide for Soil Erosion Protection, in Volume II of this manual.
3. Avoid excessive and repeated applications of dust suppressant chemicals. Time the application of dust suppressants to avoid or minimize their wash-off by rainfall or human activity such as irrigation.
4. Apply stormwater containment to prevent the conveyance of sediments and or dust suppressant chemicals into storm drains or receiving waters.
5. The use of motor oil for dust control is prohibited. Care should be taken when using lignin derivatives and other high BOD chemicals in excavations or areas easily accessible to surface water or groundwater.
6. Consult with the Ecology Northwest Regional Office on discharge permit requirements if the dust suppression process results in a wastewater discharge to the ground, groundwater, storm drain, or surface water.

Suggested BMPs for Roadways and Other Trafficked Areas

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

Suggested BMPs for Dust Generating Areas

1. Prepare a dust control plan. Helpful references include: Control of Open Fugitive Dust Sources (EPA-450/3-88-088) and Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures (EPA-450/2-92-004).
2. Limit exposure of soil (dust source) as much as feasible.

3. Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
4. Apply windbreaks in the soil such as trees, board fences, tarpaulin curtains, bales of hay, etc.
5. Cover dust-generating piles with wind-impervious fabric, or equivalent material.

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

A6.2 Dust Control at Manufacturing Sites

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

Pollutant Control Approach: Prevent dust generation and emissions where feasible, regularly cleanup dust that can contaminate stormwater, and convey dust contaminated stormwater to proper treatment.

Required BMPs

1. Clean powder material handling equipment and vehicles that can be sources of stormwater pollutants as needed to remove accumulated dust and residue.
2. Regularly sweep dust accumulation areas that can contaminate stormwater. Sweeping should be conducted using vacuum filter equipment to minimize dust generation and to ensure optimal dust removal.
3. Use in the recommended manner, approved dust suppressants such as those listed in Ecology publication "Techniques for Dust Prevention and Suppression," No. 96-433 (Ecology 1996). Application of some products may not be appropriate in close proximity to receiving waters or conveyances close to receiving waters. For more information, check with the Ecology Northwest Regional Office or the City.

Suggested BMPs

1. In manufacturing operations, train employees to carefully handle powders to prevent generation of dust.
2. Use dust filtration/collection systems such as bag house filters, cyclone separators, etc. to control vented dust emissions that could contaminate stormwater. Control of zinc dusts in rubber production is one example.
3. Use water spray to flush dust accumulations to sanitary sewers where allowed by the City or to other appropriate treatment system. Contact the City's Industrial Pretreatment Program at (425) 257-8874 for details.
4. For removal of total suspended solids in stormwater, use sedimentation basins, wet ponds, wet vaults, vegetated filter strips, or equivalent sediment removal BMPs. Refer to Volume III Flow Control and Treatment for more information about these BMPs.
5. Additional information on dust control can be found in Volume II of this manual.

A6.3 Soil Erosion and Sediment Control at Industrial Sites

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

Pollutant Control Approach: Limit the exposure of erodible soil, stabilize or cover erodible soil where necessary to prevent erosion, and/or provide treatment for stormwater contaminated with total suspended solids caused by eroded soil.

Required BMPs

1. Apply one or more of the following cover practices:
    a. Vegetative cover such as grass, trees, or shrubs on erodible soil areas
    b. Covering with mats such as clear plastic, jute, or synthetic fiber; and/or
    c. Preservation of natural vegetation including grass, trees, shrubs, and vines.
2. Control sediment through installing a vegetated swale, dike, silt fence, check dam, gravel filter berm, and/or sedimentation basin and properly grading. For design information refer to Volume II, Construction Stormwater Pollution Prevention.

3.3.7 Activity Code A7 - Other Activities

A7.1 Commercial Animal Handling Areas

Description of Pollutant Sources: Animals at racetracks, kennels, fenced pens, veterinarians, and businesses that provide boarding services for horses, dogs, cats, etc. can generate pollutants from the following activities: manure deposits, animal washing, grazing, and any other animal handling activity that could contaminate stormwater. Pollutants can include coliform bacteria, nutrients, and total suspended solids.

Pollutant Control Approach: To prevent, to the maximum extent practicable, the discharge of contaminated stormwater from animal handling and keeping areas.

Required BMPs

1. Regularly sweep and clean animal keeping areas to collect and properly dispose of droppings, uneaten food, and other potential stormwater contaminants.
2. Do not hose down to storm drains or to receiving water those areas that contain potential stormwater contaminants.
3. Do not allow any wash-waters to be discharged to storm drains or to receiving water without proper treatment.
4. 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.
5. 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.

A7.2 Keeping Livestock in Stables, Pens, Pastures, or Fields

This activity applies to management of all types of livestock. Manure from livestock can pollute stormwater and local water bodies. Animals that are not fenced off from creeks and streams can also cause severe erosion of stream banks, which in turn can silt up fish spawning areas.

Pollutants of Concern: Nutrients, suspended solids, Biochemical oxygen demand (BOD), fecal bacteria.

Required BMPs

The following BMPs or equivalent measures are required of all businesses and citizens keeping livestock in stables, pens, pastures, or fields:

1. Restrict animal access to creeks and streams, preferably by fencing. There are ways to fence and still allow animals drinking access to the stream, without allowing bank trampling and minimizing fecal inputs into the stream. Contact the Snohomish Conservation District for more information on fencing, including how to get money to provide such fencing. They can also help with replanting the stream banks to prevent further erosion. A minimum setback of 20 feet from the center of the streambed will be required on each side. Major tributaries and large farm ditches should be fenced as well.
2. Dispose of manure from stables and pens properly. Do not pile it where rain will wash nutrients into constructed or natural stormwater drainage systems that leave the property. Place it within a bermed area to contain runoff, or cover it with a tarpaulin. It may also be placed in a grassy area as far from watercourses as possible, so that any seepage has a chance to be filtered and absorbed by the grasses before reaching a creek or stream.

Suggested BMPs

1. On fields where animals are pastured, a rotational grazing system should be developed. This would mean that a field would need to be divided into a minimum of four equal units, and the stock rotated from one unit to another. The stock should not be allowed onto the pastures until the grass reaches a minimum height of 6 inches. They should be moved to the second field when the grass height is down to approximately 3 inches. Each field should be allowed to recover for a period of 21 to 28 days prior to re-grazing.
2. Monitor grazing carefully. If 90 percent of the plants' leaves are removed, the roots will stop growing for at least 18 days. If only 40 percent or less of the leaves are removed, the roots will continue to grow. Not only will overgrazing or overstocking limit pasture production, but the pastures become vulnerable to the invasion of unpalatable or poisonous weed species such as tussock, moss, buttercup, tansy ragwort, and thistle.
3. Grazing should be discontinued starting in early October. Neither the animals nor the fields benefit from grazing during the winter. Since the plants are basically dormant, the protein content is extremely low. The fields become compacted and rutted, thus reducing soil tilth, which in turn reduces summer grass yields. Fence off a small portion of the pasture to sacrifice during winter, and feed hay and grain instead of grazing.
4. Proper pasture management should also include the practices of clipping and harrowing the fields after the stock has been removed. This is done to assure uniform growth and to avoid excessive damage to the stand and a consequent reduction in yields. This would also be the optimum time to apply fertilizer, such as manure, to the fields.
5. Weed control is very important for maintaining highly productive pastures. If the practices described above are followed, much progress will be made towards weed control. Herbicides may occasionally be needed, but application should be made judiciously. It is much easier to take care of a few thistles early on than it is to get rid of a field full of them.

A7.3 Log Sorting and Handling

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

The following are pollutant sources:

1. Log storage, rollout, sorting, scaling, and cutting areas
2. Log and liquid loading areas
3. Log sprinkling
4. Debarking, bark bin, and conveyor areas
5. Bark, ash, sawdust and wood debris piles, and other solid wastes
6. Metal salvage areas
7. Truck, rail, ship, stacker, and loader access areas
8. Log trucks, stackers, loaders, forklifts, and other heavy equipment
9. Maintenance shops and parking areas

10. Cleaning areas for vehicles, parts, and equipment
11. Storage and handling areas for hydraulic oils, lubricants, fuels, paints, liquid wastes, and other liquid materials
12. Pesticide usage for log preservation and surface protection
13. Application of herbicides for weed control
14. Contaminated soil resulting from leaks or spills of fluids.

Ecology's Baseline General Permit Requirements

Industries with log yards are required to obtain coverage under the Baseline General Permit for discharges of stormwater associated with industrial activities to surface water. The permit requires preparation and onsite retention of Stormwater Pollution Prevention Plans (SWPPP). The SWPPP must identify operational, source control, ESC, and, if necessary, treatment BMPs. Required and Suggested operational, source control, and treatment BMPs are presented in detail in Ecology's Guidance Document: Industrial Stormwater General Permit Implementation Manual for Log Yards, publication No. 0410-031. It is recommended that all log yard facilities obtain a copy of this document.

A7.4 Boat Building, Mooring, Maintenance, and Repair

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

A1.3 Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures

A2.2 Fueling at Dedicated Stations

A7.15 Spills of Oil and Hazardous Substances

Pollutant Control Approach: Apply good housekeeping, preventive maintenance, and cover and contain BMPs in and around work areas.

Required BMPs

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

1. Maintenance and repair activities that can be moved on-shore must be moved accordingly. This action reduces some of the potential for direct pollution impact on water bodies.
2. Blasting and spray painting activities must be sheltered by hanging tarps to block the wind and prevent dust and overspray from escaping. Move the activity indoors if possible. See Appendix A for details on Puget Sound Clean Air Agency limitations.
3. Ground cloths must be used for collection of drips and spills in painting and finishing operations, and paint chips and used blasting sand from sand blasting.

4. Spent abrasives must be collected regularly and stored under cover to await proper disposal.
5. Greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers must be properly disposed of.
6. Oil filters shall be drained before disposal or recycling.
7. Ballast water that has an oily sheen on the surface must be collected for proper disposal rather than discharged on land or water. See BMP S.2 in Chapter 4 for details on disposal options.
8. Bilge water must be collected for proper disposal rather than discharged on land or water. See BMP S.2 in Chapter 4 for detail on disposal options. Several companies are available for bilge pump-out services. The problem can be avoided if oil-absorbent pads are used to capture the oil in the bilge water before or during pumping. If pads are used, they must be recycled or properly disposed of.
9. Maintenance yard areas must be swept and cleaned, without hosing down the area, at least once per week or as needed. This prevents sandblasting materials, scrapings, paint chips, oils, and other loose debris from being carried away with stormwater. The collected materials must be disposed of properly. See BMP S.2 in Chapter 4 for disposal options.
10. Docks and boat ramps must be swept at least once per week or as needed, and the collected materials must be disposed of properly. Dry-docks must be swept before flooding.
11. Paint and solvent mixing, fuel mixing and similar handling of liquids shall be performed on shore, or such that no spillage can occur directly into surface water bodies.
12. Routine cleanup materials such as oil-absorbent pads, brooms, dustpans, mops, buckets, and sponges must be stocked near docks.
13. When boats are washed in the water, no soaps or detergents may be used.
14. Activity A2.3 and A4.2 must be complied with if engine repair and maintenance are conducted.
15. In the event of an accidental discharge of oil or hazardous material into waters of the state or onto land with a potential for entry into state waters, immediately notify the yard, port, or marina owner or manager, Ecology, and the National Response Center at 1-800-424-8802 (24-hour). If the spill can reach or has reached marine waters, contact the U.S. Coast Guard at (206) 217-6232.

Suggested BMPs

1. Boat construction and structural repair activities should be covered.
2. Materials such as paints, tools, and ground cloths should be stored indoors or in a covered area when not in use.
3. The least toxic anti-fouling paint available should be selected.
4. Boat interiors should be routinely cleaned, with proper disposal of collected materials, so that accumulations of water drained from them are not contaminated.
5. Use sanders that have dust containment bags and avoid sanding in windy conditions.
6. All used oil should be recycled if feasible. Most marinas now offer used oil recycling services. To dispose of filters, let drain 24 hours, then double wrap in plastic and dispose of in the regular garbage, or take them to the Snohomish County Household Hazardous Waste facility for recycling. Pending state legislation may make disposal in the garbage illegal, so call the Hazardous Waste Line at 1-800-287-6429 for current information.
7. Check with marinas for other BMPs they have developed.

A7.5 Logging

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

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

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

Pollutant Control Approach: Maintain required buffers adjacent to critical areas, including streams and wetlands. Keep sediments out of water bodies and off paved areas.

Required BMPs

1. Vegetation along stream corridors, and adjacent to other water bodies and wetlands, must be preserved. Maintenance of a vegetated buffer enables filtration of most of the pollutants of concern for this activity. The above-mentioned ordinances contain specific requirements for buffer setbacks.
2. Logging access roads must have a crushed rock or spall apron construction entrance where they join the pavement to prevent sediments from being tracked onto the pavement.
3. On-site fueling and maintenance operations must follow the required BMPs as outlined in A2.4 Mobile Fueling; A2.3 Engine Repair and Maintenance; and A.4.2 Storage of Liquid Chemicals, Waste Oils, Solvents, or Petroleum Products in Portable Containers.

Suggested BMPs

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

A7.6 Mining and Quarrying of Sand, Gravel, Rock, Minerals, Peat, Clay, and Other Materials

Description of Pollutant Sources: This activity applies to surface excavation and onsite storage of sand, gravel, and other materials that are mined. All mining operations that have stormwater runoff from the site are required to apply for a NPDES permit with Ecology. Ecology has specific BMPs required by the permit. Some additional BMPs to help meet Ecology's discharge performance standards are listed below.

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

Pollutant Control Approach: Provide containment and or cover for any onsite storage areas to prevent run-on and discharge of suspended solids and other pollutants.

Suggested BMPs

1. If the material is appropriate, use excavated spoil material to form compacted berms along downslope sides of the site to contain runoff. Berms should be seeded to promote growth of grass or other vegetation to limit erosion from the berms. Safety considerations must be examined to prevent flooding due to berm failure.
2. Semi-permanent stockpiles should be seeded to promote vegetation growth to limit erosion from the stockpiles.
3. Use detention ponds to promote settling of suspended solids, or infiltration basins to filter suspended solids, to cleanup runoff before it leaves the site. See Volume III for runoff treatment BMPs.
4. Use anchored tarps to cover stockpiles at small-scale mining operations if there is a potential for contaminated stormwater to leave the site.

A7.7 Swimming Pool and Spa Cleaning and Maintenance

Description of Pollutant Sources: This activity applies to all municipal and commercial swimming pools and spas, including Snohomish Health District regulated facilities. Pools and spas at hotels, motels, and apartment and condominium complexes are covered here. Pools at single-family residences are covered in Chapter 3 of this volume. Commercial pool and spa cleaning services must follow these required BMPs for all pools they service.

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

Pollutant Control Approach: Dispose of pool or spa water to the sanitary sewer after getting pre-approval from the City's Industrial Pretreatment Program at (425) 257-8874.

Required BMPs

1. The preferred method of pool or spa water disposal is to the sanitary sewer. If a sanitary sewer is available, all Snohomish Health District regulated facilities are required to connect for draining and backwash. Contact the City's Industrial Pretreatment Program at (425) 257-8874 for specific instructions on allowable flow rates and timing before starting to drain the pool. Never discharge pool water to a septic system, as it will cause the system to fail.
2. If discharge to the sanitary sewer is not possible, pool and spa water may be discharged to a ditch or stormwater drainage system. The discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted if necessary, re-oxygenated, and volumetrically and velocity controlled to prevent re-suspension of sediments. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the City stormwater system. The City's Surface Water Management Section at (425) 257-8800 must be contacted prior to discharge for instructions on allowable flow rates for the system or ditch that is being discharged to. Neutralizing chemicals are available for de-chlorinating water. Letting the pool or spa "sit" may also reduce chlorine levels. Use a test kit to determine if the concentration has reached zero.
3. State law may allow discharges of pool water to the ground. However, the water must not cross property lines or impact neighboring properties, and a satisfactory means for distributing the water to the ground must be used so there is no runoff. Check with Ecology prior to release.
4. Diatomaceous earth used in pool filters cannot be discharged to surface waters, stormwater drainage systems, or septic systems, or on the ground.

Suggested BMPs

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

A7.8 De-icing and Anti-icing Operations for Airports, Private Roadways and Parking Lots

Description of Pollutant Sources: De-icing and/or anti-icing compounds are used on private roadways, parking areas, airport runways, and on aircraft to control ice and snow. Typically ethylene glycol and propylene glycol are de-icing chemicals used on aircraft. De-icing chemicals commonly used on roadways and parking lots include calcium magnesium acetate (CMA), calcium chloride, magnesium chloride, sodium chloride, urea, and potassium acetate. The de-icing and anti-icing compounds become pollutants when they are conveyed to storm drains or to surface water after application. Leaks and spills of these chemicals can also occur during their handling and storage.

BMPs for Airport De/anti-icing Operations

Pollutant Control Approach for Aircraft: Spent glycol discharges in aircraft application areas are process wastewaters that are regulated under Ecology's Industrial Stormwater General Permit. (Contact the Ecology Southwest Regional Office for details.) BMPs for aircraft anti-icing chemicals must be consistent with aviation safety and the operational needs of the aircraft operator.

U.S. EPA is currently studying airport de-icing as part of the pretreatment regulations (40 CFR 403). These regulations are not expected to be promulgated for several years.

Required BMPs for Aircraft:

1. Conduct aircraft de-icing or anti-icing applications in impervious containment areas. Collect aircraft de-icing spent chemicals, such as glycol, draining from aircraft in de-icing or anti-icing application areas and convey to a sanitary sewer, treatment, or other approved disposal or recovery method. Contact the City's Industrial Pretreatment Program at (425) 257-8874 to obtain permit for discharges to sanitary sewer. Divert de-icing runoff from paved gate areas to appropriate collection areas or conveyances for proper treatment or disposal.
2. Do not allow spent de-icing chemicals or stormwater contaminated with aircraft de-icing chemicals to be discharged from application areas including gate areas, to surface water or groundwater, directly or indirectly.
3. Transfer de-icing and anti-icing chemicals on an impervious containment pad, or equivalent spill/leak containment area, and store in secondary containment areas (see A4.8 Storage of Liquids in Aboveground Tanks).

Suggested BMPs for Aircraft:

1. Establish a centralized aircraft de/anti-icing facility, if feasible and practicable, or in designated areas of the tarmac equipped with separate collection drains for the spent de-icing liquids.
2. Consider installing an aircraft de/anti-icing chemical recovery system, or contract with a chemical recycler, if practicable.

Required BMPs for Airport Runways/Taxiways:

1. Avoid excessive application of all de/anti-icing chemicals, which could contaminate stormwater.
2. Store and transfer de/anti-icing materials on an impervious containment pad or an equivalent containment area and/or under cover in accordance with A4.1 Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products in this chapter. Other material storage

and transfer approaches may be considered if it can be demonstrated that stormwater will not be contaminated with the anti-icing material or the material cannot reach surface or groundwater.

Suggested BMPs for Airport Runways/Taxiways:

1. Include limits on toxic materials and phosphorous in the specifications for de/anti-icing chemicals, where applicable.
2. Consider using anti-icing materials rather than de-icing if it will result in less adverse environmental impact.
3. Select cost-effective de/anti-icing chemicals that cause the least adverse environmental impact.

Required BMPs for Private Roadways and Parking Lots:

1. Select de and anti-icing chemicals that cause the least adverse environmental impact. Apply only as needed using minimum quantities.
2. Where feasible and practicable, use roadway de-icing, such as calcium magnesium acetate, potassium acetate, or similar materials that cause less adverse environmental impact than urea and sodium chloride.
3. Store and transfer de/anti-icing materials on an impervious containment pad in accordance with A4.1 Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products in this chapter.
4. Sweep/cleanup accumulated de/anti-icing materials and grit from roads as soon as possible after the road surface clears.

Suggested BMPs for Private Roadways and Parking Lots:

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

A7.9 Roof and Building Drains at Manufacturing and Commercial Buildings

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

Pollutant Control Approach: Evaluate the potential sources of stormwater pollutants and apply source control BMPs where feasible.

Required BMPs

1. If leachate and/or emissions from buildings are suspected sources of stormwater pollutants, then sample and analyze the stormwater draining from the building.
2. If a roof/building stormwater pollutant source is identified, implement appropriate source control measures such as air pollution control equipment, selection of materials, operational changes, material recycle, process changes, etc.
3. Bare galvanized metal shall not be used for materials that convey stormwater, such as roofs, canopies, siding, gutters, downspouts, roof drains, and pipes. Any galvanized materials shall have an inert, non-leachable finish, such as baked enamel, fluorocarbon paint (such as Kynar or Hylar), factory-applied epoxy, pure aluminum, or asphalt coating. Acrylic paint, polyester paint, field-applied, and Galvalume coatings are not acceptable.

A7.10 Railroad Yards

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

Pollutant Control Approach: Apply good housekeeping and preventive maintenance practices to control leaks and spills of liquids in railroad yard areas.

Required BMPs

1. Implement the applicable BMPs in this chapter depending on the pollution generating activities/sources at a railroad yard facility.
2. Do not allow discharge to outside areas from toilets while a train is in transit. Pump-out facilities should be used to service these units.
3. Use drip pans at hose/pipe connections during liquid transfer and other leak-prone areas (Activity A2.1).
4. During maintenance do not discard debris or waste liquids along the tracks or in railroad yards.

In areas subjected to leaks/spills of oils or other chemicals, convey the contaminated stormwater to appropriate treatment such as a sanitary sewer (if approved by the City's Industrial Pretreatment Program at (425) 257-8874), to an API or coalescent plate oil/water separator for floating oils, or other appropriate treatment BMP (as approved by the City). See Volume III.

A7.11 Maintenance of Private Utility Corridors and Facilities

Description of Pollutant Sources: Passageways and equipment at petroleum product, natural gas, and other utility pipelines and electrical power transmission corridors and rights-of-way can be sources of pollutants, such as herbicides used for vegetation management and eroded soil particles from unpaved access roads. Additional potential pollutant sources include the leaching of preservatives from wood utility poles, PCBs in older transformers, water that is removed from underground transformer vaults, and leaks/spills from petroleum pipelines. The following are potential pollutants: oil and grease, total suspended solids, BOD, organics, PCB, pesticides, and heavy metals.

Pollutant Control Approach: Control of fertilizer and pesticide applications, soil erosion, and site debris that can contaminate stormwater.

Required BMPs

1. Implement BMPs included in A.9 Landscaping and Lawn/Vegetation Management and in Appendix D.
2. When water or sediments are removed from electric transformer vaults, determine whether contaminants might be present before disposing of the water and sediments. This includes inspecting for the presence of oil or sheen, and determining from records or testing if the transformers contain PCBs. If records or tests indicate that the sediment or water are contaminated above applicable levels, manage these media in accordance with applicable federal and state regulations, including the federal PCB rules (40 CFR 761) and the state MTCA cleanup

regulations (Chapter 173-340 WAC). Water removed from the vaults can be discharged in accordance with the federal 40 CFR 761.79, and state regulations (Chapter 173-201A WAC and Chapter 173-200 WAC), or via the sanitary sewer if the requirements, including applicable permits, for such a discharge are met. (See also Appendix A).

3. Within utility corridors, consider preparing maintenance procedures and an implementation schedule that provides for vegetative, gravel, or equivalent cover that minimizes bare or thinly vegetated ground surfaces within the corridor to prevent the erosion of soil.
4. Apply the appropriate BMPs from A4 Storage Activities, for the storage of waste materials that can contaminate stormwater.

Suggested BMPs

1. When selecting utility poles for a specific location, consideration should be given to the potential environmental effects of the pole or poles during storage, handling, and end-use, as well as its cost, safety, efficacy, and expected life. If a wood product treated with chemical preservatives is used, it should be made in accordance with generally accepted industry standards such as the American Wood Preservers Association Standards. If the pole or poles will be placed in or near an environmentally sensitive area, such as a wetland or a drinking water well, alternative materials or technologies should be considered. These include poles constructed with material(s) other than wood, such as fiberglass composites, metal, or concrete. Other technologies and materials, such as sleeves or caissons for wood poles, may also be considered when they are determined to be practicable and available.
2. As soon as practicable, remove all litter from wire cutting/replacing operations, etc.

A7.12 Maintenance of Stormwater Drainage and Treatment Facilities

Description of Pollutant Sources: Facilities include conveyance systems, detention facilities such as ponds and vaults, oil and water separators, biofilters, settling basins, infiltration systems, and all other types of stormwater treatment systems presented in Volume III. Catch basins can remove from 5 to 15 percent of the pollutants present in stormwater. When catch basins are about 60 percent full of sediment, they cease removing sediments. Oil and grease, hydrocarbons, debris, heavy metals, sediments, and contaminated water are found in catch basins, oil and water separators, settling basins, etc.

Pollutant Control Approach: Provide maintenance and cleaning of debris, sediments, and oil from stormwater collection, conveyance, and treatment systems to obtain proper operation.

Required BMPs

Maintain stormwater treatment facilities according to the O&M procedures presented in Appendix F, in addition to the following BMPs:

1. Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O&M are needed.
2. Promptly repair any deterioration threatening the structural integrity of the facilities. These include replacement of clean-out gates, catch basin lids, and rock in emergency spillways.
3. Ensure that storm sewer capacities are not exceeded and that heavy sediment discharges to the sanitary sewer system are prevented.
4. Regularly remove debris and sludge from BMPs used for peak-rate control, treatment, etc. and truck to a local or state government approved disposal site.
5. Clean catch basins in accordance with the information provided in Appendix F. Additional information is also included in Chapter 4 of this volume, BMP S.9 Cleaning Catch Basins.

6. Clean woody debris in a catch basin as frequently as needed to ensure proper operation of the catch basin.
7. Post warning signs; "Dump No Waste - Drains to Groundwater," "Streams," "Lakes," or emboss on or adjacent to all storm drain inlets *where practical*.

A7.13 Spills of Oil and Hazardous Substances

Description of Pollutant Sources: Owners or operators of facilities engaged in drilling, producing, gathering, storing, processing, transferring, distributing, refining or consuming oil and/or oil products are required by Federal Law to have a Spill Prevention and Control Plan if the storage capacity of the facility, which is not buried, is 1,320 gallons or more of oil, or any single container with a capacity in excess of 660 gallons and which, due to their location, could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines {40 CFR 112.1(b)}. Onshore and offshore facilities, which, due to their location, could not reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines are exempt from these regulations {40 CFR 112.1(1)(i)}. Owners of businesses that produce dangerous wastes are also required by state law to have a spill control plan. These businesses should refer to Appendix A. The federal definition of oil is oil of any kind or any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.

Pollutant Control Approach: Maintain, update, and implement an oil spill prevention/cleanup plan.

Required BMPs

1. Prepare an Emergency Spill Control Plan (SCP), which includes:
    a. A description of the facility including the owner's name and address.
    b. The nature of the activity at the facility.
    c. The general types of chemicals used or stored at the facility.
    d. A site plan showing the location of storage areas for chemicals, the locations of storm drains, the areas draining to them, and the location and description of any devices to stop spills from leaving the site such as positive control valves.
    e. Cleanup procedures.
    f. Notification procedures to be used in the event of a spill, such as notifying key personnel. Agencies such as Ecology, the City Fire Department, Washington State Patrol, U.S. Coast Guard, and the U.S. EPA shall be notified.
    g. The name of the designated person with overall spill cleanup and notification responsibility.
2. Train key personnel in the implementation of the Emergency Spill Control Plan. Prepare a summary of the plan and post it at appropriate points in the building, identifying the spill cleanup coordinators, location of cleanup kits, and phone numbers of regulatory agencies to be contacted in the event of a spill.
3. Update the Spill Control Plan regularly.
4. Immediately notify Ecology and the City if a spill may reach sanitary or storm sewers, groundwater, or surface water, in accordance with federal and Ecology spill reporting requirements.

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

   Spill kits should include appropriately lined drums, absorbent pads, and granular or powdered materials for neutralizing acids or alkaline liquids where applicable. In fueling areas: absorbent should be packaged in small bags for easy use and small drums should be available for storage of absorbent and/or used absorbent. Spill kits should be deployed in a manner that allows rapid access and use by employees.

A7.14 Elimination of Illicit Connections to Storm Drainage System

Description of Pollutant Sources: Illicit connections are unpermitted sanitary or process wastewater discharges to a storm drain or to a surface water, rather than to a sanitary sewer, industrial process wastewater or other appropriate treatment. They can also include swimming pool water, filter backwash, cleaning solutions/washwater, cooling water, etc. Experience has shown that illicit connections are common, particularly in older buildings.

Pollutant Control Approach: Identify and eliminate unpermitted discharges or obtain an NPDES permit, where necessary, particularly at industrial and commercial facilities.

Applicable Operational BMPs:

1. Eliminate unpermitted wastewater discharges to storm drains, ground water, or surface water; and,
2. Convey unpermitted discharges to a sanitary sewer if allowed by the local sewer authority, or to other approved treatment; and,
3. Obtain appropriate permits for these discharges.

Recommended Additional Operational BMPs: At commercial and industrial facilities conduct a survey of wastewater discharge connections to storm drains and to surface water as follows:

1. Conduct a field survey of buildings, particularly older buildings, and other industrial areas to locate storm drains from buildings and paved surfaces. Note where these join the public storm drain(s).
2. During non-stormwater conditions inspect each storm drain for non-stormwater discharges. Record the locations of all non-stormwater discharges. Include all permitted discharges.
3. If useful, prepare a map of each area as it is to be surveyed. Show on the map the known location of storm drains, sanitary sewers, and permitted and unpermitted discharges. Aerial photos may be useful. Check records such as piping schematics to identify known side sewer connections and show these on the map. Consider using smoke, dye or chemical analysis tests to detect connections between two conveyance systems (e.g., process water and stormwater). If desirable, conduct TV inspections of the storm drains and record the footage on videotape.
4. Compare the observed locations of connections with the information on the map and revise the map accordingly. Note suspect connections that are inconsistent with the field survey.
5. Identify all connections to storm drains or to surface water and take the actions specified above as applicable BMPs.

Chapter 4 - Source Control BMP Descriptions

In the previous chapter, different commercial and industrial activities were described and BMPs for pollution prevention were listed. This chapter provides the detailed descriptions of those source control BMPs.

Activity 4.3, BMPs to Consider for All Activities, provides a list of general BMPs that each business should consider. Most of these are common sense, housekeeping types of activities, such as spill cleanup, moving activities indoors, and using the least toxic materials available. The implementation of these types of BMPs will help improve water quality.

4.1 Index of BMP Descriptions

BMP	DESCRIPTION TITLE
S.1	Dispose of Collected Runoff and Waste Materials Properly
S.2	Connect Process Water Discharges to a Sanitary Sewer, Holding Tank, or Water Treatment System
S.3	Cover the Activity with a Roof or Awning
S.4	Cover the Activity with an Anchored Tarpaulin or Plastic Sheet
S.5	Pave the Activity Area and Slope to a Sump or Holding Tank
S.6	Surround the Activity Area with a Curb, Dike, or Berm or Elevate the Activity
S.7	Implement IPM Measures
S.8	Clean Catch Basin

4.2 Source Control BMPs

4.2.1 S.1 Dispose of Collected Runoff and Waste Materials Properly

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

- Sanitary sewer and septic systems
- Recycling facilities
- Municipal solid waste disposal facilities
- Hazardous waste treatment, storage, and disposal facilities.

Many liquid wastes and contaminated stormwater (depending on the pollutants and associated concentrations present) may be put into the sanitary sewer, subject to approval by the City's Industrial Pretreatment Program at (425) 257-8874.

If wastes cannot be legally discharged to a sanitary sewer or septic system, one of the other three disposal options must be used. Sumps or holding tanks may be useful for storing liquid wastes temporarily. The contents must be disposed of in the sanitary sewer or at a dangerous waste facility depending on the nature of the waste.

Recycling facilities are a recommended option for many commercial and household items, including used oils, used batteries, old equipment, glass, some plastics, metal scrap materials, solvents, paints, wood and land clearing wastes, and various other solid wastes. Solid wastes that cannot be recycled and that are not

hazardous must be disposed of at a licensed municipal solid waste disposal facility. The list in Appendix B has the phone numbers and addresses of these facilities in the City.

Dangerous and hazardous wastes must be properly transported to an appropriate hazardous waste treatment, storage, and disposal facility.

Costs of disposal vary considerably from option to option. Especially in the case of dangerous wastes, different types of wastes should be kept segregated. Disposal costs are usually determined by the most hazardous or difficult to dispose of waste present, so costs can be kept down by not mixing wastes. The Snohomish Health District Hazardous Waste section at (425) 339-5200 can help determine the best disposal options for the waste.

4.2.2 S.2 Connect Process Water Discharges to a Sanitary Sewer, Holding Tank, or Wastewater Treatment System

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

The first priority for these businesses is discharge of process water to a sanitary sewer via a new or existing plumbing connection. In order to connect to the sewer, the City's Industrial Pretreatment Program must be contacted at (425) 257-8874 for information on permits for the connection. Pretreatment of industrial wastewaters will often be necessary before it is allowed to discharge to the sewer, and more information can be obtained by calling the number above.

If a sanitary sewer is not available, or if it is determined that a discharge connection is not allowed, the only remaining options are holding tanks or an onsite wastewater treatment facility. 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. The contents of the holding tank must be pumped out or drained before the tank is full and disposed of properly (see BMP S.2 in this chapter for information on disposal options). If a sanitary sewer connection cannot be made and a holding tank is not used, a wastewater treatment facility must be constructed on the site. This treatment facility must be designed to receive and effectively treat all discharges of process water from the business. Ecology must be contacted for approval of such a facility, since discharges from the treatment facility will enter surface waters or be spread on land. See Appendix A for Ecology's requirements for discharges of process waters.

For all types of process water discharges the following measures are required if the activity is to remain uncovered. Define a designated area for the activity and provide a mechanism for prevention of stormwater run-on into the activity area. This can be a curb, dike, or berm (see BMP S.7 in this chapter for more information) or similar effective means to prevent run-on. In this manner, only the precipitation that falls within the activity area is discharged and/or treated along with the activity process water. The designated area should be paved and sloped to a central collection drain. The collection drain must connect to the sanitary sewer (with pretreatment if required), the onsite holding tank, or the onsite treatment facility, whichever method is selected.

This process water BMP can be made more effective if the activity is covered, thus reducing the total amount of water to be treated.

4.2.3 S.3 Cover the Activity with a Roof or Awning

Not every activity can or needs to be located inside a building. In many cases, a simple roof or awning will protect the activity from coming into contact with stormwater, and usually at a lower cost than a complete building. If a structure will be built, permits must be obtained from the City's Planning Department (425) 257-8731, which will look at Fire Code requirements and Zoning Code Provisions.

The roof structure can be designed in several ways. One option is a lean-to type of structure, where sheets of corrugated steel, fiberglass, aluminum, or similar impermeable material are attached to the wall of a building and are supported by sturdy poles. Similarly, if there is no building to attach to, roofing materials can be sufficiently supported at all four corners as a stand-alone cap, or a waterproof tent canopy can be used.

The area of the roof cover should be sufficient to prevent any precipitation from reaching the covered materials.

Another option for covering an activity is to use an overhanging awning of sufficient size to prevent rain from reaching the materials. Many of the building permit, fire code, and zoning requirements will also apply to these structures.

Activities such as fueling operations may be more conveniently covered by an island-type overhanging roof. This type of roof is supported by columns along the center of the structure rather than at the corners, enabling vehicles easy access underneath while still providing sufficient protection from rain.

Note that floating fuel stations (such as some used for refueling boats) 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 used if they perform the same function. This BMP should usually be implemented in conjunction with sump or sanitary sewer drains and provisions for prevention of stormwater run-on into the covered area. BMPs S.6 and S.7 in this chapter present information on sump installation and run-on prevention.

4.2.4 S.4 Cover the Activity with an Anchored Tarpaulin or Plastic Sheet

Some activities, such as stockpiling of raw materials, can be effectively covered with a sturdy tarpaulin or heavy plastic sheet 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 tarpaulin 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 tarpaulin to the ground. The tarpaulin must be inspected daily to ensure that no holes or gaps are present in the tarpaulin coverage.

The tarpaulin 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 can occur.

Tarpaulins are an inexpensive and 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 S.7 for more information).

4.2.5 S.5 Pave the Activity Area and Slope to a Sump or Holding Tank

<u>This BMP applies to several activities that cannot be covered effectively</u>. It is particularly suited to activities with the potential for leaks and spills, but that otherwise do not generate excessive amounts of

polluted runoff. Examples are storage of liquid chemicals, waste oils, and solvents in portable containers such as drums; loading and unloading of liquids from trucks; and painting, finishing, and coating activities. A sump or holding tank serves to provide spill containment until the liquids can be pumped out and properly disposed of. 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. To prevent run-on, the area should be enclosed with a berm, curb, or dike. 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 break it down, releasing additional pollutants. If the area is not yet paved and materials are present which may react with asphalt, the area must be paved with concrete. If the area is already paved with asphalt, an asphalt sealant can be applied which can aid in preventing pavement degradation. Whichever paving material is used, the paved surface must be free of gaps and cracks.

The sump or holding tank should have a capacity large enough to contain the entire volume of a potential spill.

The cost of constructing a sump and the disposal of accumulated contents can be high, so businesses should consider whether other allowable alternative BMPs can be used.

Commercial services that pump sumps and holding tanks are listed in the Yellow Pages of the phone directory under Environmental and Ecological Services.

BMPs S.4, S.5, and S.7 in this chapter present information on covering activities and run-on prevention.

4.2.6 S.6 Surround the Activity Area with a Curb, Berm, or Dike, or Elevate the Activity

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

If a curb, dike, or berm is used to prevent stormwater run-on to a covered activity area, and the activity area is paved or otherwise impermeable, the berm should be placed underneath the covering so that rain will not pond inside it. 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. Aboveground storage tanks 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, Ecology or Snohomish Health District restrictions) do not apply, it should function so that all stormwater runoff from rain events up to the 6-month storm is contained in the immediate activity area until 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 a stormwater treatment system is presently 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 to the treatment system. 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.

Difficulties in maintenance may arise with disposal of the captured water on sites without stormwater treatment capability. The collected rainwater may need to be treated before discharge. If the activity is located on impermeable ground, then potentially contaminated water will accumulate within the containment area. If contaminated, this accumulated water cannot simply be drained from the area; it must be collected and disposed of at a licensed disposal facility. During the wet season, this course of action can lead to frequent draining 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 plastic child's wading pool may be sufficient for some activities that do not require a lot of space, such as storing painting materials, and temporary storage of wastes in drums.

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.

The volume of the containment area should be equal to 110 percent of the volume of the largest tank.

It should be noted that neglect and poor maintenance can render the containment useless. Other BMPs should be considered before containment is. Commercial products are available that are a combination containment box/elevated pedestal. These effective devices effectively prevent stormwater run-on by elevating containers off the ground, and allow for collection of spills and drips inside the pedestal box. Similar arrangements can be constructed by hand as well.

BMPs S.4, S.5, and S.6 in this chapter provide information on covering activities and sump installation.

4.2.7 S.7 Implement Integrated Pest Management Measures

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

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

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

- Monitoring and inventory of pest populations
- Determination of pest-induced injury and action levels

- Identification of priority pest problems
- Selection and timing of least toxic management tools
- Site-specific treatment with minimized chemical use
- Evaluation and adjustment of pesticide applications.

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

More information on integrated pest management is available from the Washington State Department of Agriculture and from the Washington State University Extension Service. Refer to Appendix D for an example of an Integrated Pest Management Program.