

ATTACHMENT “A”

**OPERATIONS AND MAINTENANCE MANUAL
FOR DRAINAGE FACILITIES**

FOR

**Best Parking Lot Cleaning
Puyallup, Washington**

**Revised March 2024
September 2023**

**Prepared for:
BPLC Properties LLC**

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**C.E.S. NW, INC.
429 29TH STREET NE, SUITE D
PUYALLUP, WA 98372
(253) 848-4278**

Project#20083

Section 1 – Project Description

Site Address: 2412 Inter Ave Puyallup, WA 98372

Developer Address: 2412 Inter Ave
Puyallup, WA

Tax Parcel Numbers: 2105200320, 2105200350, 2105200340 and 2105200361

Ownership/Maintenance: Property Owner

The Best Parking Lot Cleaning project proposes the paving of an existing gravel parking lot and accompanying storm facilities on a 1.86-acre site comprised of four parcels (2105200320, 2105200350, 2105200340 and 2105200361) zoned Limited Manufacturing (ML). The site is accessed from Inter Ave with two commercial driveway approaches. The project site proposes approximately 44,578 sq.ft. of asphalt paving across onsite improvements and offsite driveway approach improvements. The project proposes a detention pond (BMP D.1) for flow control of the site improvements, and runoff treatment is provided by a combined wet pond (BMP T10.40) underneath the detention pond and two continuous inflow biofiltration swales (BMP T9.30) within the right-of-way. All disturbed areas which are not converted to impervious surface apply soil amendments in accordance with BMP T5.13. The average annual cost for maintenance is approximated to be \$10,000.00.

Section 2 – Maintenance Importance and Intent

“The importance of maintenance for the proper functioning of stormwater control facilities cannot be over-emphasized. A substantial portion of failures (clogging of filters, resuspension of sediments, loss of storage capacity, etc.) are due to inadequate maintenance. Stormwater BMP maintenance is essential to ensure that BMPs function as intended throughout their full life cycle.

The fundamental goals of maintenance activities are to ensure the entire flow regime and treatment train designed for this site continue to fully function. For this site these include:

- Maintain the ability of storm facility to attenuate flows.
- Maintain ability to safely convey design stormwater flows.
- Preserve soil and plant health, as well as stormwater flow contact with plant and soil systems.
- Clearly identify systems so they can be protected
- Keep maintenance costs low
- Prevent large-scale or expensive stormwater system failures
- Prevent water quality violations or damage to downstream properties.

Section 3 – Responsible Parties

Stormwater drainage facilities will be installed, constructed, and maintained with documentation of maintenance by the homeowner. This maintenance plan shall be kept onsite and must be made available for inspection by the City of Puyallup upon request.

Section 4 – Facilities Requiring Maintenance

The following stormwater facilities/Best Management Practices require maintenance:

- Combined Detention/Wet Pond
- Continuous Inflow Biofiltration Swale
- Conveyance Pipes and Catch Basins.
- Amended Soils
- Landscaping

Section 5 – Maintenance Instructions

“The parties responsible for maintenance must review and apply the maintenance requirements contained herein. These maintenance instructions outline conditions for determining if maintenance actions are required, as identified through inspection. However, they are not intended to be measures of the facility’s required condition at all times between inspections. Exceedance of these conditions at any time between inspections or maintenance activity does not automatically constitute a violation of these standards. However, based upon inspection observations, the inspection and maintenance presented in these checklists shall be adjusted to minimize the length of time that a facility is in a condition that requires a maintenance action. For facilities not owned and maintained by the City, a log of maintenance activity that indicates what actions were taken must be kept on site and be available for inspection by the City.”

The following pages contain maintenance needs for most of the components that are part of your drainage system, as well as for some components that you may not have. Let the City know if there are any components that are missing from these pages. Ignore the requirements that do not apply to your system. You should plan to complete a checklist for all system components on the following schedule:

1. Monthly from November through April.
2. Once in late summer (preferably in September).
3. After any major storm (use 1-inch in 24-hours as a guideline).

Using photocopies of the checklist pages check off the problems that you looked for each time you did an inspection. Add comments on problems found and actions taken. Keep these “checked” sheets in your files, as they will be used to write your annual report. Some items do not need to be looked at every time an inspection is done. Use the suggested frequency at the left of each item as a guideline for your inspection.

Section 6 – Vegetation Maintenance

Plant material affecting the storm water system consists of grass, leaves, and yard debris. Maintenance checklists on the following pages and instructions listed above address appropriate maintenance requirements.

REQUIRED ACTIONS: The following actions shall be taken to ensure that pollution generated on site shall be minimized:

1. Warning signs (e.g., "Dump No Waste-Drains to Stream") shall be painted or embossed on or adjacent to all storm drain inlets. They shall be repainted as needed.
2. Sediment removed from the catch basins and storm system shall be disposed of in a proper manner. Contact the City of Puyallup for instruction prior to completing this task.

ATTACHMENT "A"

**MAINTAINANCE PROGRAM
COVER SHEET**

Inspection Period: _____

Number of Sheets Attached: _____

Date Inspected: _____

Name of Inspector: _____

Inspector's Signature: _____

Table V-A.1: Maintenance Standards - Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet. In general, there should be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations. (Apply requirements of adopted IPM policies for the use of herbicides).	No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with local health department) Complete eradication of noxious weeds may not be possible. Compliance with State or local eradication policies required
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants (Coordinate removal/cleanup with local water quality response agency).	No contaminants or pollutants present.
	Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents destroyed and dam or berm repaired. (Coordinate with local health department; coordinate with Ecology Dam Safety Office if pond exceeds 10 acre-feet.)
	Beaver Dams	Dam results in change or function of the facility.	Facility is returned to design function. (Coordinate trapping of beavers and removal of dams with appropriate permitting agencies)
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted IPM policies
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance and inspection access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering with access or maintenance, do not remove If dead, diseased, or dying trees are identified (Use a certified Arborist to determine health of tree or removal requirements)	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood). Remove hazard Trees
Side Slopes of Pond	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.	Slopes should be stabilized using appropriate erosion control measure(s); e.g., rock reinforcement, planting of grass, compaction. If erosion is occurring on compacted berms a licensed engineer in the state of Washington should be consulted to resolve source of erosion.
Storage Area	Sediment	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or outletting condition of the facility.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.

Table V-A.1: Maintenance Standards - Detention Ponds (continued)

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
	Liner (if Applicable)	Liner is visible and has more than three 1/4-inch holes in it.	Liner repaired or replaced. Liner is fully covered.
Ponds Berms (Dikes)	Settlements	Any part of berm which has settled 4 inches lower than the design elevation If settlement is apparent, measure berm to determine amount of settlement Settling can be an indication of more severe problems with the berm or outlet works. A licensed engineer in the state of Washington should be consulted to determine the source of the settlement.	Dike is built back to the design elevation.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)	Piping eliminated. Erosion potential resolved.
Emergency Overflow/Spillway and Berms over 4 feet in height	Tree Growth	Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping. Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.	Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed engineer in the state of Washington should be consulted for proper berm/spillway restoration.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)	Piping eliminated. Erosion potential resolved.
Emergency Overflow/Spillway	Emergency Overflow/Spillway	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. (Rip-rap on inside slopes need not be replaced.)	Rocks and pad depth are restored to design standards.
	Erosion	See "Side Slopes of Pond"	

Table V-A.4: Maintenance Standards - Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris (Includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
	Structural Damage	Structure is not securely attached to manhole wall. Structure is not in upright position (allow up to 10% from plumb). Connections to outlet pipe are not watertight and show signs of rust. Any holes - other than designed holes - in the structure.	Structure securely attached to wall and outlet pipe. Structure in correct position. Connections to outlet pipe are water tight; structure repaired or replaced and works as designed. Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing. Gate cannot be moved up and down by one maintenance person. Chain/rod leading to gate is missing or damaged. Gate is rusted over 50% of its surface area.	Gate is watertight and works as designed. Gate moves up and down easily and is watertight. Chain is in place and works as designed. Gate is repaired or replaced to meet design standards.
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
Manhole	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)	See Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)
Catch Basin	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins

Table V-A.5: Maintenance Standards - Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%. Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe. Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height. Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No Trash or debris located immediately in front of catch basin or on grate opening. No trash or debris in the catch basin. Inlet and outlet pipes free of trash or debris. No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin). Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Top slab is free of holes and cracks. Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound. Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Basin replaced or repaired to design standards. Pipe is regouted and secure at basin wall.
	Settlement/ Mis-alignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening. Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation blocking opening to basin. No vegetation or root growth present.
	Contamination and Pollution	See Table V-A.1: Maintenance Standards - Detention Ponds	No pollution present.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Cover/grate is in place, meets design standards, and is secured
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place, meets the design standards, and is installed and aligned with the flow path.

Table V-A.7: Maintenance Standards - Energy Dissipators

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
External:			
Rock Pad	Missing or Moved Rock	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil.	Rock pad replaced to design standards.
	Erosion	Soil erosion in or adjacent to rock pad.	Rock pad replaced to design standards.
Dispersion Trench	Pipe Plugged with Sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed so that it matches design.
	Not Discharging Water Properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench). Intent is to prevent erosion damage.	Trench redesigned or rebuilt to standards.
	Perforations Plugged.	Over 1/2 of perforations in pipe are plugged with debris and sediment.	Perforated pipe cleaned or replaced.
	Water Flows Out Top of "Distributor" Catch Basin.	Maintenance person observes or receives credible report of water flowing out during any storm less than the design storm or its causing or appears likely to cause damage.	Facility rebuilt or redesigned to standards.
	Receiving Area Over-Saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
Internal:			
Manhole/Chamber	Worn or Damaged Post, Baffles, Side of Chamber	Structure dissipating flow deteriorates to 1/2 of original size or any concentrated worn spot exceeding one square foot which would make structure unsound.	Structure replaced to design standards.
	Other Defects	See Table V-A.5: Maintenance Standards - Catch Basins	See Table V-A.5: Maintenance Standards - Catch Basins

Table V-A.18: Maintenance Standards - Catch Basin Inserts

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment Accumulation	When sediment forms a cap over the insert media of the insert and/or unit.	No sediment cap on the insert media and its unit.
	Trash and Debris Accumulation	Trash and debris accumulates on insert unit creating a blockage/restriction.	Trash and debris removed from insert unit. Runoff freely flows into catch basin.
	Media Insert Not Removing Oil	Effluent water from media insert has a visible sheen.	Effluent water from media insert is free of oils and has no visible sheen.
	Media Insert Water Saturated	Catch basin insert is saturated with water and no longer has the capacity to absorb.	Remove and replace media insert
	Media Insert-Oil Saturated	Media oil saturated due to petroleum spill that drains into catch basin.	Remove and replace media insert.
	Media Insert Use Beyond Product Life	Media has been used beyond the typical average life of media insert product.	Remove and replace media at regular intervals, depending on insert product.

Table V-A.8: Maintenance Standards - Typical Biofiltration Swale

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Recommended Maintenance to Correct Problem
General	Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.	Remove sediment deposits on grass treatment area of the bio-swale. When finished, swale should be level from side to side and drain freely toward outlet. There should be no areas of standing water once inflow has ceased.
	Standing Water	When water stands in the swale between storms and does not drain freely.	Any of the following may apply: remove sediment or trash blockages, improve grade from head to foot of swale, remove clogged check dams, add underdrains or convert to a wet biofiltration swale.
	Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire swale width.	Level the spreader and clean so that flows are spread evenly over entire swale width.

Table V-A.8: Maintenance Standards - Typical Biofiltration Swale (continued)

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Recommended Maintenance to Correct Problem
	Constant Base-flow	When small quantities of water continually flow through the swale, even when it has been dry for weeks, and an eroded, muddy channel has formed in the swale bottom.	Add a low-flow pea-gravel drain the length of the swale or by-pass the baseflow around the swale.
	Poor Vegetation Coverage	When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom.	Determine why grass growth is poor and correct that condition. Re-plant with plugs of grass from the upper slope: plant in the swale bottom at 8-inch intervals. Or re-seed into loosened, fertile soil.
	Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.	Mow vegetation or remove nuisance vegetation so that flow not impeded. Grass should be mowed to a height of 3 to 4 inches. Remove grass clippings.
	Excessive Shading	Grass growth is poor because sunlight does not reach swale.	If possible, trim back over-hanging limbs and remove brushy vegetation on adjacent slopes.
	Inlet/Outlet	Inlet/outlet areas clogged with sediment and/or debris.	Remove material so that there is no clogging or blockage in the inlet and outlet area.
	Trash and Debris Accumulation	Trash and debris accumulated in the bio-swale.	Remove trash and debris from bioswale.
	Erosion/Scouring	Eroded or scoured swale bottom due to flow channelization, or higher flows.	For ruts or bare areas less than 12 inches wide, repair the damaged area by filling with crushed gravel. If bare areas are large, generally greater than 12 inches wide, the swale should be re-graded and re-seeded. For smaller bare areas, overseed when bare spots are evident, or take plugs of grass from the upper slope and plant in the swale bottom at 8-inch intervals.

Table V-A.11: Maintenance Standards - Wetponds

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Water level	First cell is empty, doesn't hold water.	Line the first cell to maintain at least 4 feet of water. Although the second cell may drain, the first cell must remain full to control turbulence of the incoming flow and reduce sediment resuspension.
	Trash and Debris	Accumulation that exceeds 1 CF per 1000-SF of pond area.	Trash and debris removed from pond.
	Inlet/Outlet Pipe	Inlet/Outlet pipe clogged with sediment and/or debris material.	No clogging or blockage in the inlet and outlet piping.
	Sediment Accumulation in Pond Bottom	Sediment accumulations in pond bottom that exceeds the depth of sediment zone plus 6-inches, usually in the first cell.	Sediment removed from pond bottom.
	Oil Sheen on Water	Prevalent and visible oil sheen.	Oil removed from water using oil-absorbent pads or vacor truck. Source of oil located and corrected. If chronic low levels of oil persist, plant wetland plants such as <i>Juncus effusus</i> (soft rush) which can uptake small concentrations of oil.
	Erosion	Erosion of the pond's side slopes and/or scouring of the pond bottom, that exceeds 6-inches, or where continued erosion is prevalent.	Slopes stabilized using proper erosion control measures and repair methods.
	Settlement of Pond Dike/Berm	Any part of these components that has settled 4-inches or lower than the design elevation, or inspector determines dike/berm is unsound.	Dike/berm is repaired to specifications.
	Internal Berm	Berm dividing cells should be level.	Berm surface is leveled so that water flows evenly over entire length of berm.
Overflow Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.	Rocks replaced to specifications.	

ATTACHMENT “B”

**POLLUTION SOURCE CONTROL MANUAL
FOR COMMERCIAL / INDUSTRIAL
ACTIVITIES**

FOR

**Best Parking Lot Cleaning
Puyallup, Washington**

**Revised March 2024
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**Prepared for:
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Pollution Source Control Program for Commercial/Industrial Activities

Pollution source controls are actions taken by a person or business to reduce the amount of pollution reaching the surface and ground waters. Controls, also called “best management practices” or (BMPs), include:

- ❖ Altering the activity (e.g., substitute non-toxic products, recycle used oil, reroute floor drains to sanitary sewer from storm sewer)
- ❖ Enclosing or covering the activity (e.g., building a roof)
- ❖ Segregating the activity (e.g., diverting runoff away from an area that is contaminated)
- ❖ Routing runoff from the activity to a treatment alternative (e.g., to a wastewater treatment facility, sanitary sewer, or stormwater treatment area)

Pollution source controls are needed because of the contamination found in runoff from commercial areas and the effect of this contamination on aquatic life and human health.

BMPs to Consider for all Activities

Before we get to the list of activity specific BMPs, here is a summary of items that each business should consider. Most of these are common sense, housekeeping types of solutions, but if each business would take some action on each of these, the improvement in water quality would be substantial.

1. **Avoid the activity or reduce its occurrence.** If you can, avoid the activity or do it less frequently. Is there a suitable process or a different material you can use to get the job done? Can you do a larger run of a process at one time? For instance, raw materials could be delivered close to the time of use instead of being stockpiled and exposed to the weather. Perhaps you could avoid one solvent-washing step altogether. The department of Ecology or the Tacoma-Pierce County Health Department can provide pollution prevention assistance.
2. **Move the activity indoors.** Sometimes it is fairly easy to move an activity out of the weather. The benefits of this are twofold; you prevent runoff contamination, and you provide for easier, more controlled cleanup if a spill occurs. An example would be unloading and storing barrels of chemicals inside a garage area instead of doing it outside. Please be aware

that moving storage areas indoors may require installation of fire suppression equipment or other building modifications as required by the Uniform Building Code, the Uniform Fire Code, local ordinances.

3. **Use less material.** Don't buy or use more material than you really need. This not only helps keep potential disposal, storage and pollution problems to a minimum, but will probably save you money, too.
4. **Use the least toxic materials available.** Investigate the use of materials that are less toxic than what you use now. Perhaps a caustic-type detergent or a solvent could be replaced with a more environmentally friendly product. Such a change might allow you to discharge process water to the sanitary sewer instead of paying for expensive disposal (contact Pierce County Utilities at 565-3013 to find out about allowable sanitary discharges and pretreatment permits). Remember that even if you do switch to a biodegradable product, nothing but uncontaminated water is allowed to enter the storm drain system.
5. **Create and maintain vegetated areas near activity locations.** Vegetation of various kinds can help filter pollutants out of stormwater, so it is advisable to route stormwater through vegetated areas located near your activity. For instance, many parking lots contain grassy islands, typically formed in a "hump". By creating those islands as depressions instead of humps, they can be used to treat runoff from the parking lot or roof. Also, don't forget the erosion control benefits of vegetation at your site.
6. **Locate activities as far as possible from surface drainage paths.** Activities located as far as possible from known drainage paths, ditches, streams, and drains will be less likely to pollute, since it will take longer for material to reach the drainage feature. This gives you more time to react in the event of a spill, or if it is a "housekeeping" issue, may protect the local waters long enough for you to clean up the area around the activity. Don't forget that groundwater issues are always prominent, no matter where the activity is located, so the actions taken on your site on a day-to-day basis are always important, even in dry weather.
7. **Keep storm drain systems clean.** Pollutants can concentrate over time in storm drainage structures such as catch basins, ditches and storm drains. When a large storm event occurs, it can mobilize these pollutants and carry them to receiving waters. Develop and implement

maintenance practices, inspections, and schedules for treatment devices (e.g., detention ponds, oil/water separators, vegetated swales, etc.).

8. **Reduce, reuse and recycle as much as possible.** Always look for ways to recycle instead of just disposing. This can save money as well as keep both hazardous and non-hazardous materials out of the landfills. You can learn more about other businesses that have made process changes allowing recycling of chemicals by calling the DOE at 1-800-RECYCLE and requesting publication #92-45 and 90-22. Another unique recycling opportunity for businesses is available through the Industrial Materials Exchange (IMEX). This free service acts as a waste or surplus "matchmaker", helping one company's waste become another company's asset. For instance, waste peach pits from a cannery become potpourri ingredients to another business. Call IMEX at 206625-6232 to list your potentially usable solid or chemical waste in their publication.
9. **Be an advocate for stormwater pollution prevention.** Help friends, partners and business associates find ways to reduce stormwater pollution in their activities. Most people want clean water, and do not pollute intentionally. Share your ideas and the BMPs in this manual to get them thinking about how their everyday activities affect water quality.
10. **Report violators.** Allowing anyone to pollute our water resources is wrong. We all must do our part to protect water, fish, wildlife and our own health, by employing proper BMPs, and reporting those who are causing pollution. In Pierce County, call Pretreatment Inspections at 565-3013 to report dumping to sewers, and Surface Water Management at 798-2725 to report incidents involving storm drains or ditches.

Site specific BMPs are to include, but are not limited to:

1. Pressure Washing of Building Facades, Rooftops, Pavement, Boats and other Large Objects

This activity applies to businesses and public agencies engaged in pressure washing of large objects such as building facades, fences and masonry, rooftops and boats on a site- to-site basis. Pressure washing can contribute directly to water quality degradation since the runoff from such operations typically travels straight into the storm drainage system. Pressure washing of boats in boatyards, marinas and drydock areas requires a National Pollutant Discharge Elimination System (NPDES) permit. Contact the Department of Ecology to apply for this permit. Businesses

already covered by an NPDES permit are not required to enact the BMPs listed below, since they will be meeting other requirements as specified by Ecology.

Pollutants of Concern: Suspended solids, heavy metals, Biochemical oxygen demand (BOD), Chemical oxygen demand (COD), nutrients.

Required BMPS

The following BMPs or equivalent measures are required of all businesses and public agencies engaged in pressure washing of large objects:

- ❖ Employees must be educated in measures to control pollution from pressure washing operations.
- ❖ All runoff must be collected and disposed of properly or filtered to remove pollutants. No runoff should leave the site, either overland or by entering the storm drainage system. Temporary curbs, dikes or berms can be used to direct the water to one or more collection areas, where it can then be sucked up and removed off site to be disposed of in the sanitary sewer (provided it is not considered a hazardous waste). Catch basin covers can help facilitate collection. An alternative would be to use catch basin filters to remove pollutants from the wash water before it enters the storm drainage system.
- ❖ If the pressure washing wastewater does not collect in a centralized area, such as when the area is very flat, or you are on a grassed area, a tarp or sheet must be placed under the washing area to collect paint chips and other debris that is loosened by the spray.
- ❖ Pressure washing of boats (not at boatyards, marinas or drydocks) must be done on land where runoff control can be achieved.

Suggested BMPs

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

- ❖ If detergents or cleaners must be used, use the least toxic ones that will still do the job. Use detergents that contain no phosphorus.
- ❖ Spread filter fabric underneath the object being washed to trap particulates for later disposal. This is in addition to collecting the runoff for disposal.
- ❖ Limit the amount of water you use.

2. Landscaping and Vegetation Management Activities, Including Vegetation Removal, Herbicide and Insecticide Applications, Fertilizer Applications, Irrigation, Watering, Gardening and Lawn Care

This broad activity applies to all aspects of landscaping and vegetation management, from small-scale yard maintenance to large-scale commercial landscaping businesses to municipalities maintaining public parks and roadside ditches. It includes practices aimed at controlling unwanted vegetation growth, such as herbicide spraying, cutting or pulling. This can occur on lawns, in gardens and other landscaped areas, as well as roadside ditches. It also applies to all practices aimed at enhancing the growth of vegetation. Fertilizers and insecticides are typically used in this context, as is extensive watering. This activity also covers leaf raking, lawn mowing, shrub and tree pruning and a variety of other lawn care practices.

Businesses involved in pesticide application must comply with Tacoma-Pierce County Health Department regulations and Washington State Department of Agriculture regulations regarding pesticide usage. The BMPs listed below are intended to complement other regulatory requirements. Pierce County maintenance departments for parks, utilities and roads have procedures that utilize these BMPs.

Pollutants of Concern: Toxic organic compounds, heavy metals, Chemical oxygen demand (COD), Biochemical oxygen demand (BOD), suspended solids, nutrients, oils, bacteria

Required BMPs

The following BMPs or equivalent measures are required of all businesses and public agencies performing landscaping and vegetation management activities:

- ❖ Employees must be educated about the pollution potential of improper pesticide usage, improper disposal of lawn clippings, over fertilization and over watering. Emphasis on proper storage, handling, application and disposal practices is a must.
- ❖ Herbicide, insecticide and fungicide application must not be conducted within 100 feet of surface waters such as lakes, ponds, wetlands and streams. This buffer distance is specified in the Washington State Department of Ecology Stormwater Management Manual for the Puget Sound Basin. All applications must follow manufacturers' recommendations. Pesticides must

not be applied when raining or windy. The use of aquatic herbicides requires a permit from the Department of Ecology on a site-by-site basis.

- ❖ Pesticide containers and fertilizers, whether in open piles or bags, must be stored in protected places when not in use.
- ❖ Areas where soils are temporarily stripped bare for more than two weeks must comply with the requirements in Section 8.5 from The Pierce County Stormwater Management Manual. Call Pierce County Surface Water Management at (253) 798-2725 for a copy.
- ❖ Avoid Planting noxious plant species, such as reed canary grass, purple loosestrife or tansy, particularly near lakes, wetlands and riparian areas. Contact Pierce County/WSU Cooperative Extension at 798-7980 or the Pierce County Weed Control Board at 798 -7263 for information on noxious plants.

Suggested BMPs

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

- ❖ When watering, you should attempt to minimize the amount of water used. Never water to the point of runoff.
- ❖ Grass clippings, leaves, sticks and other collected vegetation should be composted, ground and used as mulch, or disposed as garbage. Never pile or dump clippings in or near storm drains, streams, lakes, drainage ways, or other water bodies. Several local companies take landscaping and land clearing waste and convert it to a high-quality compost product suitable for landscaping use. See Recycling Services in the yellow pages of your phone book for companies nearest you. Vegetation cutting near open waters and in drainage ditches should be done carefully so that the cut material can be collected. Burning of cut vegetation is no longer an option in the urbanized area of Tacoma and Pierce County due to air quality regulations.
- ❖ Where possible, fertilizer should be worked into the soil rather than dumped on the surface.
- ❖ Sweep driveways, gutters and storm drains to remove accumulations of grass, leaves and twigs after trimming. Dispose of the material by composting, mulching, or recycling.

- ❖ Integrated pest management (IPM) is a comprehensive approach to the use of pesticides. IPM 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 practiced for herbicide, insecticide, and fungicide use.
- ❖ Fertilizers should be applied carefully. Soils should be tested to determine the proper application rate, type of fertilizer and timing for the type of soil and vegetation involved.
- ❖ Use mechanical methods of vegetation removal rather than apply herbicides.
- ❖ One of the most effective measures that can be taken to reduce the necessity for pesticide use, excessive watering, and removal of dead vegetation involves careful soil mixing and layering prior to planting. Quite often, the native vegetation is cleared, leaving the mineral soil exposed underneath. Many people tend to plant directly into this, and then cover with bark mulch. This practice usually results in heavy plant mortality and excessive water usage. By using a topsoil mix or composted organic matter that is mixed into the soil, a transition layer is created that allows for healthier, deeper root development. This can improve the health of the plants, resulting in better disease and insect resistance, and reduced water demand.
- ❖ Mulching mowers are highly recommended. They add organic matter and nutrients directly back to lawns with no disposal hassles.

3. Storage of Liquid Chemicals, Waste Oils, Solvents or Petroleum Products in Portable Containers

This activity applies to businesses and public agencies that store any type of liquid chemicals, waste oils, solvents or petroleum products in portable containers (such as drums). This activity covers permanent storage as well as temporary storage areas at temporary sites. This activity does not apply to businesses that are permitted by the Department of Ecology to treat, store or dispose of dangerous wastes. Storage of all types of flammable liquids must comply with the fire code. Businesses involved in storage of petroleum products must comply with EPA, Ecology and Tacoma-Pierce County Health Department regulations regarding spill control and prevention.

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

Required BMPs

The following BMPs or equivalent measures are required of all businesses and public agencies storing liquid chemicals, waste oils, solvents or petroleum products in portable containers:

- ❖ Liquid chemicals, waste oils and petroleum products shall be stored in such a manner and location that if the container is ruptured or toppled the contents will not discharge, flow, be washed or fall into the storm drainage system, surface waters or groundwater. This may be accomplished by designating a container storage area and providing portable or stationary containment berms or dikes, providing a spill containment sump, secondary containment or other similarly effective measure.
- ❖ Do not store containers in direct contact with the ground.
- ❖ Leaking, cracked, corroded or otherwise deteriorating storage containers must be replaced with containers in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- ❖ Employees must be trained to check for leaks and spills and trained in safe handling techniques.
- ❖ Appropriate cleanup materials must be available in a plainly labeled location near the container storage area, and employees must be trained in proper spill cleanup procedures.
- ❖ Tight-fitting lids must be present on all stored containers. Containers in active use (such as a used oil barrel with a funnel) must be protected from rain.
- ❖ If storm drains could potentially be impacted, use storm drain covers or equivalent containment devices during filling or removal of containers. Collect and recycle, or dispose of properly, all liquids that accumulate before removing the storm drain cover.

Suggested BMPs

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

- ❖ Cover the designated storage area.

- ❖ Drip pans or absorbent materials should be used beneath all mounted container taps, and also at all potential drip and spill locations during filling and unloading of containers. Any collected liquids or soiled absorbent materials must be recycled or properly disposed of
- ❖ To minimize spills, use funnels to pour liquids into storage containers.
- ❖ Separate funnels should be designated and labeled for different liquids, if applicable.
- ❖ The storage area should be swept and cleaned weekly, but never hosed down to a storm drain.
- ❖ If a sump or holding tank is used for spill containment (not required), sump drains must be inspected weekly to determine if spilled materials need to be pumped.
- ❖ In addition to covering, the designated area should be paved and sloped to a drain, and a sump or holding tank provided to capture all of the drainage.
- ❖ Reuse and recycle waste oils and excess liquids. Check your phone book for the numbers of local waste oil recyclers. For other liquids, call the Industrial Materials Exchange (IMEX) to advertise your waste, which may be someone else's asset. Contact IMEX at (206) 296-4899 or use the IMEX computer bulletin board modem access number at 1 -800-858-6625.
- ❖ Use one or a combination of the following treatment BMPs:
 - Filtration with media designed for removal of petroleum products, if they are the only type of liquid stored.
 - Constructed wetlands.
 - Oil/water separators are highly recommended for treatment of runoff from areas used for storage of petroleum products.

4. Building Repair, Remodeling, Painting and Construction

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

Pollutants of Concern: Toxic hydrocarbons, toxic organics, suspended solids, heavy metals, pH, oils and greases

Required BMPs

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

- ❖ Employees must be educated about the need to control site activities to prevent stormwater pollution, and also trained in spill cleanup procedures.
- ❖ Spill cleanup materials, appropriate to the chemicals being used on site, must be available at the work site at all times.
- ❖ The work site must be cleaned up at the end of each workday, with materials such as paints and solvents put away indoors or covered and secured so that vandals will not have access to them.
- ❖ The area must be swept daily to collect loose litter, paint chips, grit, and dirt.
- ❖ Absolutely no substance can be dumped on pavement, on the ground, in or toward storm drains, regardless of its content. unless it is water only.
- ❖ Ground or drop cloths must be used underneath outdoor painting, scraping, and sandblasting work. Ground cloths, buckets, or tubs must also be used anywhere that work materials are laid down.
- ❖ 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 paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents for recycling or proper disposal.
- ❖ Storm drain covers or similarly effective devices must be used if dust, grit, wash water, 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:

- ❖ Recycle materials whenever possible.
- ❖ 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.
- ❖ Activities such as paint mixing, and tool cleaning should occur over a ground cloth or within a containment device such as a tub.
- ❖ Catch basin filter inserts should be considered if work will be ongoing for an extended period of time or if significant amounts of hydrocarbons, oils and greases, heavy metals, or suspended solids are expected in site runoff.

5. Vehicle and Equipment Parking and Storage

This activity applies to all types of parking lots (commercial, public and private), fleet vehicle lots and yards (including rental car lots and car dealerships), equipment sale and rental lots, and driveways. Because this activity is so difficult to manage in terms of pollution control, the BMPs listed below, if used throughout the County and City, will give a cumulative large benefit in terms of pollution protection.

Pollutants of Concern: Toxic hydrocarbons, toxic organics, oils and greases, heavy metals, nutrients, suspended solids, pH

Required BMPs

The following BMPs or equivalent measures are required of all businesses and public agencies with parking lots and driveways:

- ❖ The use of soaps or detergents to wash vehicles or equipment in any area that drains to a storm drain, ditch, stream, or other water body is not allowed. Soapy wash waters must discharge to the sanitary sewer or suitable treatment system. Call Pierce County Water Resources Permits at 798-2737 for information on connecting to the sewer.

- ❖ Parking areas, storage areas, and driveways shall be swept (not hosed to a storm drain) at least once per month to collect dirt, litter and debris. Make sure to dispose of these materials properly.
- ❖ Gutters, drains and catch basins must be checked frequently for evidence of dirt and debris, and cleaned as needed. Storm drain inlets and gutters on the property must be cleaned at least once per month, without hosing sediments and other debris into the storm drain. Catch basins should be cleaned a minimum of twice per year, and more frequently if needed.
- ❖ An oil/water separator or oil absorbent pillow insert for catch basins or other treatment BMP must be installed for treatment of runoff if other measures do not sufficiently reduce the problem of contaminated runoff.

Suggested BMPs

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

- ❖ Garbage cans with lids should be provided to reduce parking lot litter.
- ❖ Divert runoff to vegetated areas near the parking lot.
- ❖ Through the use of incentives and discounts, businesses should encourage employees and customers to carpool and use public transit.
- ❖ Implement one of the following stormwater treatment BMPs:
 - Catch basin filter insert
 - Infiltration basin
 - Wet pond or vault
 - Constructed wetland
 - Vegetated biofilter
 - Filtration