

## **Stormwater Best Management Practices**

### ***Nutrient Runoff Reduction***

As a municipal separate storm sewer system (MS4) permittee, your community is required to prevent increased nitrogen and phosphorus (nutrients) concentrations and oxygen depletion in receiving waters because both nitrogen and phosphorus can negatively impact our water. Landscape management activities (e.g. mowing, fertilizer application, watering, and other gardening and lawn care activities) can negatively impact stormwater runoff and increase nitrogen and phosphorus concentrations. In addition, pet and wildlife waste can be a major contributor to stormwater pollution. Dog feces are high in nitrogen and phosphorus, and dog urine contains nitrogen. Pigeons, geese, rodents, and raccoons can also contaminate our water when their feces enter storm drains, ponds, lakes, creeks, and rivers.

#### **Affected Facilities**

The following best management practices (BMPs) aim to minimize the concentration of nitrogen and phosphorus in stormwater runoff. These practices apply at all municipal and county facilities where fertilizers are stored, mixed, applied, recycled, or disposed of, and at municipal properties in which lawns or vegetation are mowed, trimmed, and maintained (e.g. parks, golf courses, and open space properties).

#### **Best Management Practices (BMPs)**

##### ***Landscape Maintenance***

- Mulch-mow grasses whenever possible; grass clippings are a natural fertilizer.
- Sweep grass clippings from sidewalks or streets back onto grassy areas.
- Dispose of organic wastes by composting whenever possible. When composting is not possible, dispose of organic wastes at an approved disposal facility. In both cases, ensure that runoff from sites does not enter a waterway.
- Do not wash down or dispose of lawn clippings, leaves, tree trimmings, or other landscape waste in or near a storm drain, drainage ditch, or open body of water.
- Collect and dispose of wastes generated by cleaning equipment (e.g. grass clippings) in the trash or by composting.
- Irrigate with the minimal amount of water needed. Never water at rates that exceed the infiltration rate of the soil.
- Maintain all irrigation systems so that irrigation uses the minimum amount of water possible, is applied evenly, and does not run off. Repair broken or leaking sprinkler heads as soon as possible.
- Use automatic timers or computer-controlled systems on irrigation equipment to minimize runoff.
- Incorporate evapotranspiration rates and/or weather data into daily irrigation rates.
- Monitor daily, monthly, and yearly irrigation usage, and set goals for annual water use reduction.
- Use a landscape design that minimizes the use of lawn or turf grass, which can also reduce the need for fertilizers (i.e. Xeriscaping).

##### ***Application of Fertilizers***

- Properly calibrate all fertilizer application equipment to ensure proper application rate.
- Train employees on proper application methods, as recommended by the equipment manufacturer.
- Time the application of fertilizers to coincide with the manufacturer's recommendation for best results.

- Base fertilizer application on soil test results to avoid excess application.
- Consider using fertilizers with low or no levels of phosphorus.
- Do not apply fertilizers when heavy rainfall or winds are expected.
- Never over-apply fertilizers.
- Use slow release fertilizers.
- Use the lowest lbs/acre rate possible (“spoon feeding”).
- Till fertilizers into the soil when possible (i.e. when seeding new areas or during “grow-in periods”) rather than broadcasting them on the surface.
- Designate “no spray zones” and/or “buffer areas” around ponds, lakes, or streams. Avoid spraying fertilizers within 25-50 feet of any surface water or storm drainage structure (unless stricter limits apply).
- Raise mower height to >3” in buffer areas around water features to allow the vegetation to slow down and filter stormwater runoff.
- Reduce the need for chemical, algal control in ponds through proper aeration, nutrient reduction, bio-filtration, vegetation management, and/or biological controls.
- Do not apply fertilizers or pesticides in or near any drainage areas or irrigation ditches.
- Sweep or blow granular fertilizers back onto grassy areas from pavement and sidewalks.

### ***Storage and Handling of Fertilizers***

- Store and mix fertilizers inside a covered area that has an impervious (i.e. hard or paved) surface, preferably indoors, so that spills or leaks will not contact soils or waters.
- Ensure that spill kits and absorbents are available in the event of a spill. Clean up any spills or leaks of fertilizers promptly using dry cleanup methods.
- Mix only the minimum amount of fertilizer that will be needed for the immediate job.
- Use water left over from rinsing containers or application equipment to dilute the next batch or apply left over chemicals to target areas.
- Do not handle or dispose of fertilizers, pesticides, herbicides, or fungicides outdoors or near storm drains, irrigation ditches, or surface water.
- Dispose of excess or leftover chemicals according to the instructions on the label, preferably on the target pest, vegetated area, or as hazardous waste.

### ***Pet Waste Cleanup***

- Provide pet waste bags and waste containers at all parks, trailheads, and open space properties.
- Post signs listing the local ordinances and penalties for not picking up pet waste.
- Collect pet waste in a bag, and deposit it in a trashcan or dumpster.
- Routinely pick up any bags left along trails, parks, or streets.
- Empty trash cans and dumpsters regularly.
- Keep lids on all trash cans and dumpsters, and line them with trash bags.

### ***Permanent Stormwater BMP Maintenance***

- Maintain permanent or structural BMPs (e.g. inlets, catch basins, culverts, and detention/retention ponds) designed to remove solids and nutrients to ensure that they continue to function as designed.
- Conduct regular inspection and cleaning of permanent, structural BMPs to keep them functioning properly.
- Discourage waterfowl from living in permanent BMPs. Wet ponds (detention or retention ponds) and other stormwater management structures can appeal to waterfowl, whose resulting fecal input can cause an increase in nutrient loading.

### **Street Sweeping**

- Regularly sweep roads and parking lots high in sediment to remove solids on which phosphorous may be attached.

### **Wildlife and Bird Waste Control**

- Discourage wildlife and birds from living in storm drains, nesting under bridges, or congregating on golf courses.
- Scare geese away from ponds on golf courses or parks.
- Clean and inspect storm drains regularly to prevent wildlife from living in the storm drainage system.
- Sweep and clean bike paths and paved trails under bridges and near creeks. Collect debris and dispose of in the trash; do not sweep or wash it into nearby creeks, ponds, or rivers.
- Contact local animal control, pest control, or the Colorado Division of Wildlife to remove wild animals from bridges, storm drainage systems, or golf courses.

### **Required Employee and Contractor Training**

- Train all current and new employees and contractors on stormwater pollution prevention BMPs.
- Conduct refresher training for all employees and contractors as needed.
- Contracts should stipulate that all contracted employees have been trained in proper stormwater management BMPs.
- All employees who handle or apply fertilizers, pesticides or herbicides should be trained on the most recent Material Safety Data Sheets (MSDSs).
- Train employees on the proper methods for cleaning up spills or leaks of pesticides, herbicides and fertilizers. (See: <http://pacepartners.com/stormwater/municipal-operations> BMPs: *Spill Cleanup*.)

### **References**

1. Colorado's Phase II Municipal Guidance, October 2001
2. *California Stormwater BMP Handbook*, January 2003
3. *Knoxville (TN) BMP Manual, Activities, & Methods*; January 2001
4. *City of Tacoma: Surface Water Management Manual (Vol. IV Source Control BMPs)*, January 2003
5. *Municipal Facility Runoff Control Plan* (City of Lakewood, CO)
6. *Best Management Practices for Industrial Storm Water Pollution Control* (Santa Clara Valley, CA)
7. Colorado Stormwater Council; *Fertilizer, Herbicide, and Pesticide Application*
8. *Partners for a Clean Environment (PACE) Stormwater BMPs*:  
<http://pacepartners.com/stormwater/municipal-operations>.