

# STORMWATER POLLUTION PREVENTION *For Sports Facilities*

pacific northwest  
POLLUTION PREVENTION  
resource center



## BEST MANAGEMENT PRACTICES (BMPs)

### Topic 1: Parking & Paved Areas

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## INTRODUCTION

Parking lots and garages tend to accumulate sediment, automotive fluids, litter and debris, leached metals, de-icing chemicals, bird and rodent fecal matter, and aerial deposition products from outside sources. These contribute to stormwater pollution, affecting water quality and aquatic life. Presented below are source reduction opportunities to minimize or prevent stormwater pollutants in parking lots and garages, followed by approaches to help implement the BMPs.

## STORMWATER SOURCE REDUCTION

### **Source Reduction Opportunities at Each Event (Short-Term)**

- During the sports season, and/or higher-use times, establish sweeping frequencies (for example, after every four events), types of sweepers to be used in different areas or situations around the site. *See Sweeping Practices below for more details.*
- Where tailgating is the norm, consider mechanical sweeping of these areas after each event.
- Provide clearly-labelled, centralized trash and debris collection areas for tailgaters.
- Outreach to fans and employees during games (with video or audio messaging) to minimize litter and dumping of liquids in the parking areas and grounds as well as the stadium or arena.

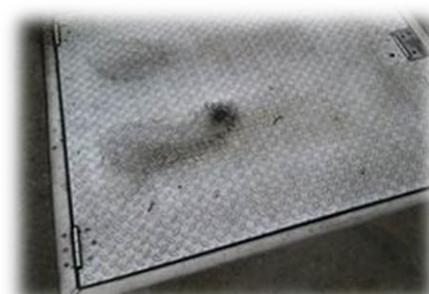
## **Source Reduction Opportunities for Parking/Paved Lots (Long-Term)**

### **Pre-emptive Controls**

- Establish minimum standards for sweeping in the off season. *See Sweeping Practices below for more details.*
- Develop and implement material handling procedures to avoid spills. Have spill kits available near high-risk areas.
- Implement a pavement inspection protocol, based on activity at the site, to identify vehicle fluid leaks, excessive litter, or other stormwater-polluting materials. At least annually, inspect paved areas for significant deterioration and cracks in pavement where dissolved pollutants and fine sediment can accumulate. Schedule necessary repairs.
- Avoid zinc or copper-based moss and fungicide applications.
- Replace any galvanized cover plates for manholes, underground meters, vaults, etc. with non-galvanized covers.
- Label all storm drains to remind guests, vendors, and employees that anything entering the drain will flow untreated to surface waters.
- Apply the paint during dry conditions and use as little traffic or pavement paint as possible to still meet codes (e.g., dashed lines vs. solid, thinner lines).



*Repairing cracks in pavement prevents pollutants from accumulating in lot.*



*Using a stainless steel cover, instead of galvanized, eliminates a zinc pollutant source.*

### **Maintain Clean Premises**

- Clean oil or vehicle fluid leaks as soon as possible. Use absorbents (such as rags, absorbent mats or pads, rice hull ash, vermiculite, or sand) to pick up greasy or oily spills. Sweep or vacuum to pick up the saturated absorbents<sup>1</sup>.
- Use dry cleaning methods for exterior cleanup when possible. If water must be used, note that local sewerage agencies may require volume and pollution removal on wash waters before they are permitted for drainage. Best practices for water are:
  - Do not use heated water if it is going directly to a storm drain.
  - Divert wash water to a suitable landscaped area that can take up the water, possibly with berms or socks.
  - Use a drain plug in storm drains with a pump to reroute the water to a landscaped area or collection vessel.
  - Collect the water with vacuum booms.
  - Install filters in catch basins and clean them or replace them as necessary during the cleaning.

- Many jurisdictions do not allow chemical additives in exterior cleaning. If chemicals are allowed and are deemed necessary, collect or divert the wash water per above. Also, use the least toxic chemicals, the least amount of those chemicals, and collect the wash water for proper disposal. Note that there is no legal definition of “natural” and the legal definition of “biodegradable” is ambiguous. Products claiming either of these on the label can still harm the environment if they enter surface waters without wastewater treatment. (See [EPA DfE Label Product Database](#)<sup>2</sup>, [GreenSeal](#)<sup>3</sup>, and the City of San Francisco’s [SF Approved List](#)<sup>4</sup> for safer alternatives).



- Minimize pollutant releases associated with equipment in parking lots (e.g. dumpsters, HVAC equipment, storage tanks, etc.) through good housekeeping, management and maintenance, moving items inside where possible, or building covered areas over storage zones.
- Implement scheduled catch basin cleaning and filter replacement, at least twice yearly.
- When cleaning painted pavement surfaces, remove and collect visibly peeling or flaking paint prior to washing.
- When removing old paint or graffiti, consider safer alternative dry removal methods such as dry ice or recycled glass blasting<sup>5</sup>. If water is used, collect and properly dispose of wash water.
- Choose professional vehicle washing company that collects and treats wash water.
- Use sound snow and ice management methods. De-icers are often over-applied and many are more environmentally damaging than others. Minimize use of chemicals by removing snow before it melts, using anti-icing strategies (including pre-applying anti-icing chemicals intended to break bonds before the snow falls). Purchase de-icers that are safer for the environment. Consult additional resources, such as this practical guide to environmental purchasing strategies and safer product lists: [Green Purchasing Best Practices: Deicers](#)<sup>6</sup>.

### **Additional Recommendations for Sweeping Practices and Frequencies**

#### **Choose Appropriate Sweepers**

- Ensure that you or your contractor use and maintain the appropriate sweeper(s) for your site.
- The three types of sweepers available are mechanical, regenerative air, and vacuum filter. The typical “parking lot sweeper” is designed for smaller parking lots and mostly to pick up litter, not stormwater pollutants and fine particles (aka fines).
- With the objective of protecting stormwater, a regenerative air sweeper is the most effective for removing pollutants and fines<sup>7</sup>.

- The typical parking lot sweeper design (similar to a cross-flow or vacuum system) emits a significant amount of airborne particles that can pollute the air, and even re-deposit on the parking lot.
- Variables affecting the removal efficiency may be traveling speed, targeted particulate and sizes, types of surfaces, travel distances, and number of passes.
- If there are nearby neighbors or businesses, the noise and air pollution generated by the street sweeper may also be a factor in which machine to use.

### **Validate Sweepers**

- Validate qualifications and performance of sweeping
- Sweeping staff and contractors are not always under the supervision of facility management. If you are using a contracted service, validate the company's credentials and ethics, and ensure they are effectively completing the job compliant to the contract and/or requirements, and also properly disposing of swept material (photo courtesy of TYMCO<sup>8</sup>).



### **Schedule Sweeps**

- Establish and maintain a sweeping schedule.
- Sweeping frequency and the type of sweeper used depend on several variables, including the effectiveness of the type of sweeper, vehicle traffic and use patterns, tailgating, the type of surface and cover, the number of sweeping passes, the type of pollutants to be removed – such as dissolved materials, fines, or larger debris – and more.
- During the regular season, sweep uncovered lots after a set number of events, as established by need and inspections. Frequency may vary based on the weather, pollutant loadings, the sports season, tailgating behaviors, or other conditions. Example protocols might be set to mechanical sweeping every three or four large events, and regenerative air sweeping twice per season. Additional sweeping may be stipulated for isolated areas known to have high pollutant loadings.
- During the regular season, sweep covered lots after a set number of events, as established by need and inspections. Frequency may vary based on tailgating and other conditions. Example protocols might be set to perform mechanical sweeping every 10 to 12 events, and regenerative air sweeping at least once per season.
- During the off season, keep paved areas clean with mechanical sweeping as necessary, and conduct a deep sweep just before the typical wet season begins to remove sediments accumulated during the summer or dry periods.
- Maintain a log of the miles swept, number of passes, and amount of waste collected in each area. Use this information to refine sweeping plan(s) that targets areas accumulating greater amounts of materials, along with the appropriate frequency to achieve the greatest removal.

## Ensure Proper Disposal

- Adhere to all federal and state regulations that apply to the testing, disposal, and/or reuse of sweepings. Larger generators may find reuse opportunities with their state land use department.

## REFERENCES

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1. Bay Area Stormwater Management Agencies Association. 2003. [Pollution from Surface Cleaning](#).
2. Environmental Protection Agency's [Design for Environment \(DfE\) Labeled Products](#).
3. [GreenSeal™ Certified Products and Services](#).
4. City of San Francisco's Extensive List of Greener products – [SF Approved List](#)
5. [EPA Demonstrates Innovative Graffiti Removal Products in San Francisco](#).
6. [Green Purchasing Best Practices: Deicers](#) National Association of State Procurement Officials (NASPO), Prepared by Responsible Purchasing Network, 2013.
7. Environmental Sciences Branch SPAWAR Systems Center San Diego (2008). [Metals Load Reduction in Storm Water using High Efficiency Sweepers](#).
8. Telecommunication. 4/22/13. D. Welfelts, [TYMCO](#).