Stormwater Best Management Practice

Storm Drain System Cleaning

Minimum Measure: Pollution Prevention/Good Housekeeping for Municipal Operations
Subcategory: Municipal Activities

Description

Municipal stormwater commonly flows through storm drains and from there, sometimes without treatment, into waterbodies. A storm drain consists of one or more conduits (closed pipes or open channels or ditches) connecting one or more inlets. If not routinely cleaned and maintained, these systems can accumulate large amounts of debris and pollutants, which can lead to clogging, flooding and water quality problems. The specifics depend on the type and amount of pollutant involved, but problems can include foul odors, excessive sediment export and reduced dissolved oxygen in receiving waters.

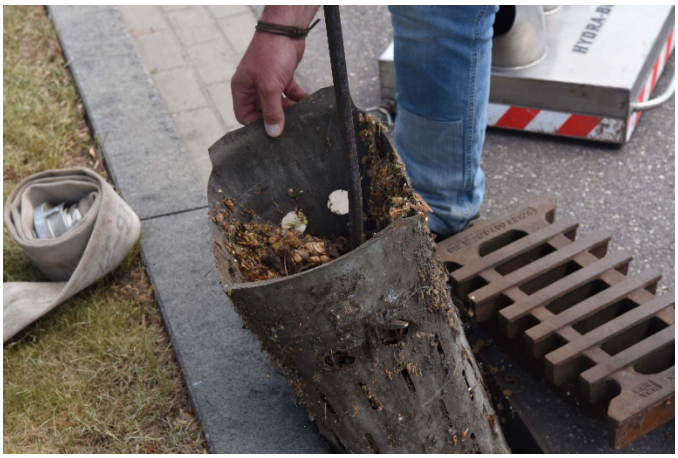
Some common pollutants found in storm drains include:

- Trash and debris
- Sediments
- Oil and grease
- Antifreeze
- Paints
- Cleaners and solvents
- Pesticides
- Fertilizers
- Animal waste
- Deicing materials
- Detergents

Implementation

Cleaning Programs

Like all infrastructure, storm drain systems need regular inspection and cleaning. Municipal or contracted professional personnel should do this work, and they should have training on applicable regulations and cleaning and disposal procedures. Many municipalities have standard operating procedures for cleaning their storm drain systems, which include training, methods, equipment and frequencies for cleaning. For example, the Brighton, Colorado, utilities department has developed storm sewer cleaning guidelines. They recommend cleaning the storm drain systems every 5 years—in practice, this means that the city cleans 20 percent of the system every year (City of Brighton, 2018).



Debris from storm drains and catch basins should be collected and disposed of according to best practices and local regulations.

Photo Credit: Airman 1st Class Milton Hamilton/U.S. Air Force

To increase the effectiveness of any cleaning program, a municipality can establish a pre-inspection program that maps and creates an asset inventory of all storm drains and conveyances. This makes it possible to identify and prioritize problem areas, and thus to set a more efficient cleaning schedule that takes into account storm drain accessibility, cleaning routes and any seasonal patterns. (For example, a system might need more frequent cleanouts during the fall when leaf litter increases. Another example could include a system in a high traffic area that is identified as a priority system to clean out more frequently.)

Cleaning Methods

There are two main methods of storm drain system cleaning, dry cleaning and wet cleaning. The dry method—which should be performed first—involves direct removal by hand or using vacuums or shovels. The wet method typically involves jetting and flushing

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(City of Brighton, 2018). For larger systems, municipalities tend to use vactor trucks (often called vacuum or jet trucks) with either method.

Having removed the sediment and debris, a municipality should treat or discard it according to applicable solid waste and hazardous materials regulations. This includes rinse water from wet cleaning: it is important to contain, collect and properly dispose of this rinse water, whose sediment and debris content may qualify as hazardous waste. The municipality should identify temporary storage areas for debris and protect those areas from wind, rain and surface stormwater flow.

Accurate recordkeeping is important for any cleaning method. Field staff should document the staff, location, cleaning date, equipment used, frequency of waste disposal, and number of drainage structures cleaned. They should also record the amount of sediment or debris collected or removed.

Limitations

Several factors may limit the effectiveness of a storm drain cleaning program. For example, tree roots can clog storm drain systems, affecting overall structural integrity and making cleaning difficult. Storm drain systems may be in areas that are hard to access and clean. And municipalities often lack the resources to train employees or contractors, purchase the equipment they need, or actually do the cleaning. A targeted cleaning program (see the discussion of pre-inspection programs above) can at least help address known hot spots and help prioritize cleanings.

Cost Considerations

Including equipment and labor, a storm drain cleaning program can be expensive. Vactor trucks can cost $80,000 to $150,000 (City of Manhattan, 2018). For total cleaning costs, a 2005 survey of NPDES stormwater compliance costs in California found actual cleaning expenditures of $8 per linear foot of drain line and $170 per catch basin, with all storm drain cleaning activities making up 10–20 percent of all stormwater costs (California State University, Sacramento, 2005). Municipalities should also factor in costs for properly disposing of the collected sediment and debris.

Additional Information

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

References

City of Brighton. (2018). *Storm sewer cleaning*.

City of Manhattan. (2018). *City Commission agenda memo*.

California State University, Sacramento. (2005). *NPDES stormwater cost survey*. Office of Water Programs.