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National Pollutant Discharge Elimination System (NPDES)

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Municipal Vehicle and Equipment Maintenance

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Minimum Measure: Pollution Prevention/Good Housekeeping for Municipal Operations

Subcategory: Municipal Activities

Description

Common activities at municipal maintenance shops include parts cleaning, vehicle fluid replacement, and equipment replacement and repair. Automotive maintenance facilities are considered to be stormwater "hot spots." Hotspots are areas that generate significant loads of hydrocarbons, trace metals, and other pollutants that can affect the quality of stormwater. Some of the wastes generated at automobile maintenance facilities include:

- Solvents (degreasers, paint thinners, etc.)
- Antifreeze
- Brake fluid and brake pad dust
- Battery acid
- Motor oil
- Fuel (gasoline, diesel, kerosene)
- Lubricating grease



This small auto repair shop performs work outdoors without a roof and without berms or other containment for spills, which increases the threat of stormwater pollution

Fluid spills and improper disposal of materials result in pollutants, heavy metals, and toxic materials entering ground and surface water supplies, which can create public health and environmental risks. Municipal facilities that properly store automotive fluids and thoroughly clean up spills can help reduce the effects of automotive maintenance practices on stormwater runoff and, consequently, local water supplies.

Applicability

Municipal activities require the use of various vehicles and equipment, such as public works operation and maintenance vehicles, police cars, fire trucks, and school and public transit buses. Maintenance facilities may be located at several municipal facilities. An estimated 180 million gallons of used oil is improperly disposed of annually (Alameda CCWP, 1992), and just a single quart of motor oil can pollute 250,000 gallons of drinking water. For this reason, automotive maintenance facilities' discharges to storm and sanitary sewer systems are highly regulated. For more information on educating the public and commercial businesses about vehicle maintenance, see the [Stormwater Outreach for Commercial Businesses](#) [EXIT Disclaimer](#) fact sheet.

Siting and Design Considerations

The most effective way to minimize wastes generated by automotive maintenance activities is to prevent their production in the first place. Pollution prevention programs trying to reduce polluted liquid discharges from automotive maintenance facilities to storm drains should stress "dry shop" techniques. Among suggestions for creating a dry operation:

- All maintenance activities should be performed inside or under cover.
- Spills should be cleaned up immediately, without water whenever possible and clean up materials disposed of properly.
- Floor drains should be sealed.
- A solvent service can be hired to supply parts and cleaning materials and to collect spent solvent.

Facilities that discharge to the sanitary sewer system may be required to treat their wastewater prior to its release from the site. Some municipalities require the use of structural treatment devices to pretreat wastes before they are discharged to sewage treatment plants. These devices prevent oils and grease from entering the sewer system, often by separating the oil and solids from the water through settling or filtration.

Other methods can also help prevent or reduce pollutant discharges from vehicle maintenance facilities. The following suggestions can reduce vehicle maintenance and repair impacts. Many of these practices apply both to business owners and to residents who maintain their own vehicles. These practices also apply to the maintenance of school buses, public works, fire, police, parks, and other types of municipal fleets. The following list is not comprehensive. Many other suggestions for reducing impacts are available to those responsible for managing stormwater from maintenance facilities.

Waste Reduction

- Keep the number of solvents used to a minimum. It makes recycling easier and it reduces hazardous waste management cost.
- Do all liquid cleaning at a centralized station to ensure that solvents and residues stay in one area.
- Locate drip pans and draining boards to direct solvents back into a solvent sink or holding tank for reuse.

Use of Safer Alternatives

- Use non-hazardous cleaners when possible.
- Replace chlorinated organic solvents with nonchlorinated ones like kerosene or mineral spirits.
- Purchase recycled products, such as engines, oil, transmission fluid, antifreeze, and hydraulic fluid, to help support the recycled products market.

Spill Containment and Cleanup

- Install berms or other measures to contain spills and prevent work surface runoff from entering storm drains.
- Use as little water as possible to clean spills, leaks, and drips.
- Follow the spill prevention plan.

Good Housekeeping

- Reinforce employee training and public outreach to reinforce proper disposal practices.
- Conduct maintenance work such as fluid changes indoors.
- Update facility schematics to accurately reflect all plumbing connections.
- Closely monitor parked vehicles for leaks and place pans under any leaks to collect the fluids for proper disposal or recycling.
- Promptly transfer used fluids to recycling drums or hazardous waste containers.
- Dispose of liquid waste properly.
- In the event of a spill, cover drains with drain mats.
- Store cracked batteries in leakproof secondary containers.

Parts Cleaning

- Use detergent-based or water-based cleaning systems instead of organic solvent degreasers.

- Steam clean or pressure wash parts instead of using solvents. Water discharged into the sanitary sewer may require treatment prior to release. You should check with the sewer authority to determine if treatment is required. The wastewater generated from steam cleaning can be discharged to the on-site oil/water separator, but remember that such separators must be periodically maintained to ensure their effectiveness.

Limitations

There are a number of limitations to implementing recommendations for automotive maintenance facilities. Space and time constraints may rule out indoor work. Containing spills from vehicles brought on-site after working hours may be impossible. Education for employees on proper disposal of wastes must continually be updated. Installing structural BMPs for pretreatment of wastewater discharges can be expensive. Recycled materials and fluids may cost more than non-recycled materials. Some facilities can be limited by a lack of recycled materials providers. Other facilities can be limited by the absence of business that provide hazardous waste removal, structural BMP maintenance, solvent recycling, or other services.

Maintenance Considerations

Outdoor areas, especially parking areas for vehicles awaiting repair, should be inspected regularly for drips, spills and improperly stored materials (unlabeled containers, auto parts that might contain grease or fluids, etc.). Good housekeeping is an important step in reducing stormwater pollution in these hotspot settings.

The proper functioning of structural BMPs is an important maintenance consideration for facilities responsible for pretreating their wastewater prior to discharging. To maintain their effectiveness, the devices require routine cleanout of oil and grease, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure that pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

Effectiveness

It's difficult to quantify the effectiveness of automotive maintenance best management practices at removing pollutants. However, there are studies that demonstrate that pollution prevention practices can reduce the impacts of automotive fluids. A 1994 study of auto recycling facilities found that best management practices can reduce stormwater toxicity and pollutant loads. Through the use of structural and nonstructural BMPs, the study facility was able to reduce concentrations of lead, oil, and grease to levels approaching USEPA benchmarks (CWP, 1995).

Palo Alto, California, has instituted a program that has had great success in controlling contaminated flows from vehicle maintenance facilities. The Clean Bay Business Program offers local business the opportunity to be officially recognized as an environmentally responsible retailer. In exchange for allowing inspectors to visit once a year, and for agreeing to implement recommended management practices, participating businesses earn the designation of a Clean Bay Business. In doing so, they gain promotional opportunities like twice annual listings in full-page newspaper ads, decals for shop windows, and other Clean Bay Business materials. Other promotions, like prize drawings and discount coupon giveaways, help generate additional business for participants. The number of businesses that have received the Clean Bay Business designation has risen steadily since the program's inception. In 1992, when the program began, only four percent of businesses used all the recommended management practices. By 1998, that number had risen to 94 percent (NRDC, 1999).

The program's success in altering the behaviors of participating business resulted in the following:

- The elimination of 78 direct discharges to storm drains by ceasing or modifying the practices used in parking lot cleaning, vehicle washing, wet sanding, and other activities.
- A 90 percent drop in violations of storm drain protection requirements from 1992 through 1995.
- The number of shops conducting outdoor removal of vehicle fluids without secondary containment fell from 43 to 4.

Cost Considerations

The initial cost for Palo Alto's program was approximately \$300. Each subsequent year costs \$150. The cost includes inspector's visits and follow-up work, outreach materials, mailing lists, and database management. The program has been expanded to include auto parts stores and outreach to local high schools and adult education repair classes.

References

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