

POLLUTION PREVENTION FACT SHEET: AUTOMOBILE MAINTENANCE

Description

This pollution prevention measure involves creating a program of targeted outreach and training for businesses involved in automobile maintenance regarding practices that control pollutants and reduce stormwater impacts. Automotive maintenance facilities are considered to be stormwater “hotspots” where significant loads of hydrocarbons, trace metals and other pollutants can be produced that can affect the quality of stormwater runoff. For more information see *Cars are Leading Source of Metal Loads in California*, Article 6 in *The Practice of Watershed Protection*. Some of the types of waste generated at automobile maintenance facilities and by residents performing their own car maintenance at home include:

- solvents (paints and paint thinners)
- antifreeze
- brake fluid and brake lining
- batteries
- motor oils
- fuels (gasoline, diesel, kerosene)
- lubricating grease

It has been estimated that each year over 180 million gallons of used oil is disposed of improperly (Alameda CCWP, 1992) and that a single quart of motor oil can pollute 250,000 gallons of drinking water. For this reason, automotive maintenance facilities are highly regulated with respect to discharges to storm and sanitary sewer systems. Fluid spills and improper disposal of materials result in pollutants, heavy metals and toxic materials entering ground and surface water supplies, creating public health and environmental risks. Alteration of practices involving the cleanup and storage of automotive fluids and cleaning of vehicle parts can help reduce the influence of automotive maintenance practices on stormwater runoff and local water supplies (Purdue Research Foundation, 1996).

Applicability

The automotive repair industry is the leader in number of generators and amount of total waste produced for small quantity generators of hazardous waste in the United States (US EPA, 1985). Common activities at maintenance shops that generate this waste include the cleaning of parts, changing of vehicle fluids, and replacement and repair of equipment. These activities are also performed by residents at home in their driveway in the course of normal vehicle care. Since the use of automobiles is not limited by geographic or climatic conditions, maintenance facilities are present nationwide and the concerns involving waste created during vehicle repair are similar across the country. In ultra urban areas, the impacts of automotive maintenance practices are more pronounced due to the greater concentrations of vehicles and higher levels of impervious surface.

Design Considerations

The most effective way to minimize the impacts of automotive maintenance generated waste is by avoiding its production in the first place. Pollution prevention programs seeking to reduce liquid discharges to sewer and storm drains from automotive maintenance should stress techniques that allow facilities to run a dry shop. Among the suggestions for creating a dry operation:

- Do not use water for clean up whenever possible and clean up spills immediately.
- Seal off floor drains that are connected to the sanitary sewer.
- Hire a solvent service to supply parts cleaning materials, and to collect the spent solvent.

Facilities that are not able to eliminate discharges to the sanitary sewer system may be required to treat their wastewater prior to release from the site. Some municipalities require the use of structural treatment devices to pretreat wastes before they are discharged for treatment at 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 are available to help prevent or reduce the discharge of pollutants from vehicle maintenance. Table 1 lists some of the common suggestions that can reduce vehicle maintenance and repair impacts. Many of these practices apply both to business owners and to residents who maintain their own vehicles. This list is not comprehensive, and many other ideas for reducing impacts are available to those responsible for managing stormwater runoff from maintenance facilities.

Table 1. Recommendations for Reducing the Stormwater Impacts of Automotive Maintenance	
Pollution Prevention Method	Suggested Activities
Waste Reduction	The number of solvents used should be kept to a minimum to make recycling easier and to reduce hazardous waste management cost. Do all liquid cleaning at a centralized station to ensure solvents and residues stay in one area. Locate drip pans and draining boards to direct solvents back into solvent sink or holding tank for reuse.
Using Safer Alternatives	Use non-hazardous cleaners when possible. Replace chlorinated organic solvents with non-chlorinated ones like kerosene or mineral spirits. Recycled products such as engines oil, transmission fluid, antifreeze, and hydraulic fluid can be purchased if available to support the market of recycled products.
Spill Clean Up	Use as little water as possible to clean spills, leaks, and drips. Rags should be used to clean small spills, dry absorbent material for larger spills, and a mop for general cleanup. Mop water can be disposed of via the sink or toilet to the sanitary sewer.
Good Housekeeping	Employee training and public outreach are necessary to reinforce proper disposal practices. Conduct maintenance work such as fluid changes indoors. Update facility schematics to accurately reflect all plumbing

	<p>connections.</p> <p>Parked vehicles should be monitored closely for leaks and pans placed under any leaks to collect the fluids for proper disposal or recycling.</p> <p>Promptly transfer used fluids to recycling drums or hazardous waste containers.</p> <p>Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets.</p> <p>Obtain and use drain mats to cover drains in the event of a spill.</p> <p>Store cracked batteries in leakproof secondary containers.</p>
Parts Cleaning	<p>Use detergent based or water based cleaning systems instead of organic solvent degreasers.</p> <p>Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning should be discharged to a pretreatment structure.</p>

Limitations

There are a number of limitations to implementing every recommendation for automotive maintenance facilities. Space and time constraints may make performing work indoors unfeasible. Containment of spills from vehicles brought on-site after working hours may not be possible. Proper disposal education for employees must continually be updated. Installation of structural treatment practices for pretreatment of wastewater discharges can be expensive. Prices for recycled materials and fluids may be higher than those of non-recycled materials. Some facilities can be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance or solvent equipment and solvent recycling.

Maintenance Considerations

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

Effectiveness

The effectiveness of automobile maintenance pollution prevention practices at removing pollutants is difficult to quantify. However, there are studies that demonstrate the effect pollution prevention practices can have in reducing impacts from automotive fluids. A 1994 study of auto recycling facilities demonstrates the effect using management practices can have on reducing stormwater toxicity and pollutant loads. Through the use of structural and non-structural management practices, the study facility was able to reduce concentrations of lead, oil and grease to levels approaching US EPA benchmarks.

A program that has had great success in controlling contaminated flows from vehicle maintenance facilities is the Clean Bay Business Program in Palo Alto, California. In exchange for allowing inspectors to visit a facility once a year and implementing recommended management practices, the facility is designated as a Clean Bay Business. This entitles the facility to promotional tools like listings twice a year in full page newspaper ads, decals for shop windows, and other Clean Bay Business materials. Other promotions involving prize drawings and discount coupon giveaways help generate business for the facilities in the program. The effectiveness of the program at creating behavioral changes is evident in the increase in the number of facilities that have received the Clean Bay Business designation. In 1992 when the program began, only four percent of businesses used all of the recommended management practices. By 1998, ninety-four percent of businesses had instituted the practices suggested (NRDC, 1999).

The effectiveness of those program at altering behaviors detrimental to stormwater is impressive. After participation in the program, the changes facilities made had the following impacts:

- 78 direct discharges to storm drains were eliminated by ceasing or modifying the practices used for activities such as parking lot cleaning, vehicle washing, and wet sanding.
- Violations of storm drain protection requirements fell by 90% from 1992 through 1995.
- The number of shops conducting outdoor removal of vehicle fluids without secondary containment fell from 43 to 4.

The initial per facility cost for the program was approximately \$300, with a cost of \$150 for subsequent years. This cost includes inspector visits and follow-up work, outreach materials, mailing list and database management. The program has been expanded to include auto parts stores and outreach to local high school and adult education repair classes.

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