Automotive Service – Body Repair

Photo Credit: Geoff Brosseau

Description

This category includes facilities that conduct auto body repair and painting. Information specific to: auto dismantling, maintenance, and service stations is provided in other guide sheets.

Pollutant Sources

The following are sources of pollutants:

- Wet and dry sanding
- Painting
- Washing cars and other vehicles
- Cleaning floors
- Auto body repair products

Pollutants can include:

- Heavy metals (copper, lead, nickel, and especially zinc)
- Hydrocarbons (oil and grease, PAHs)
- Toxic chemicals (solvents, chlorinated compounds)
- Paints

Approach

Minimize exposure of rain and runoff to auto body repair and painting areas by using cover and containment. In and around these areas, use good housekeeping to minimize the generation of pollutants. Make stormwater pollution prevention BMPs a part of standard operating procedures and the employee training

CASQA
California Stormwater Quality Association

program. Provide employee education materials in the first language of employees, as necessary.

Auto body repair products, such as body filler, primers, paints, and sandpaper often contain significant amounts of zinc. The original paint on a customer's car may also contain high concentrations of zinc. The following practices should help reduce or eliminate the amount of zinc and other pollutants in wastewater discharges.

Source Control BMPs

The best management practices are listed by activity or area.

Sanding

Dry Sanding

- Conduct all sanding indoors.
- Sweep, vacuum, or use other dry cleanup methods routinely to pick up dust from dry sanding of primer, metal, or body filler. Make extra efforts to thoroughly sweep or vacuum dust prior to mopping.
- Use vacuum sanding equipment whenever possible in order to reduce the amount of airborne dust.

Wet Sanding

- Conduct all sanding indoors.
- Do not wet sand in a wash rack or in an area with a floor drain.
- If possible, reduce or eliminate need for a sanding bucket:
  - Use dent repair tools whenever practical for small dents.
  - Use vacuum sanding equipment whenever practical (for larger panels) in order to minimize the amount of wastewater.
  - Use spray bottle to squirt water onto the panel being sanded. This eliminates sanding bucket wastewater and also minimizes drips and spills.
- Place a pan under the car panel being sanded to catch drips. Pour the collected water back into the wet sanding bucket.
- Clean up drips with a rag, or let the drips dry and then sweep or vacuum up the dust.

Options for Handling a Wet Sanding Bucket

In addition to the potential for wet sanding to cause stormwater pollution, emptying the wet sanding bucket directly into a sink or other sanitary sewer drain is one of the primary causes of body shop wastewater discharge permit violations. Therefore, shops should seriously consider reducing or eliminating the need for a wet sanding bucket. However, if a sanding bucket must be used, there are three options for disposal of the contents:

Option # 1: Settling

Up to 80 percent of the zinc in the sanding bucket would settle out if the bucket is simply left to stand undisturbed for 24 - 48 hours. This is the simplest and least costly method of achieving significant zinc reductions – assuming the shop has space for the buckets to be put aside during the workday. Sanding bucket wastewater may also be poured into a settling unit (see next section) prior to discharge to a sump or to the sanitary sewer.

Step 1: Remove sponge and sandpaper from water. Wring out the sponge over the bucket.

Step 2: Settle out zinc particles in one of two ways:

a) Allow the wet sanding bucket to stand at least overnight – preferably longer – in a place where it will not be disturbed.

or

b) Pour contents of the wet sanding bucket into a settling unit.

Devise a system to let shop employees know how long the bucket has been settling, and that it is not to be disturbed.

Step 3: Separate water from sludge:

Carefully bail the clear water from the top of the bucket, or remove the clear water from the settling unit after it has been allowed to sit at least overnight. Avoid any agitation of sludge on the bottom. The clear water on top may be discharged to the sanitary sewer through a drain or permitted treatment system (such a sump or oil/water separator).

Step 4: Dispose of sludge:

Dispose of non-hazardous dried sludge in trash. Please note that the California Department of Toxic Substances Control places responsibility on each shop owner for providing that such waste is non-hazardous. If the sludge is hazardous, it must be disposed of appropriately. (Contact the DTSC for more information)

If the settling bucket is uncovered, make sure it's in secondary containment.

Option #2: Discharge to a Permitted Treatment System

A shop may elect to route contents of the wet sanding bucket through a treatment system or recycling unit prior to discharging to the sanitary sewer. An industrial waste discharge permit must be obtained in many jurisdictions for such a sewer discharge. In addition, the wastewater should first be allowed to settle overnight in the bucket or in a settling unit (see Option #1).

Option #3: Offsite Disposal

A shop may choose to collect and dispose of wet sanding wastewater offsite. This alternative may be attractive to those shops interested in reducing their waste streams or eliminating all wastewater discharges and becoming a "zero-discharger." There are two possible methods for offsite disposal of wet-sanding bucket waster water:

a) Disposal with other collected wastes

Depending upon the hauler, it may be possible to dispose of the wet-sanding wastewater with waste paint rinse water or waste antifreeze. Check with the local hauler to see if this is acceptable.

or

b) Disposal as a hazardous waste

Wet-sanding wastewater may be collected separately and hauled offsite for disposal as a hazardous waste, either by a licensed waste hauler or through a Very Small Quantity Generator (VSQG) hazardous waste collection program for small businesses.

Simple Settling Units for Wet Sanding and Mop Wastewater

Settling units may be used to remove zinc and other metals from wastewater, generated by activities such as wet sanding and mopping. Even shops with a sump or oil-water separator may find it beneficial to settle out wet sanding and mop wastewater prior to discharge to the separator and /or sanitary sewer. Settling units can range from simple, compact containers to complex treatment systems. Unless the shop has a high volume of wastewater from sanding or mopping, it may want to consider one of the simpler units – since complex treatment systems can be very expensive to purchase, install, and maintain. In fact, the shop may be able to make its own simple settling unit using an empty plastic 30-gallon drum, for example, and a little creativity.

Selecting the Right Unit for the Shop

In choosing or designing a settling unit, several factors should be considered including:

- Potential volume of wastewater and the size of a container that will ensure adequate settling time. In order to determine the appropriate size, the volume of wastewater should be calculated – wet sanding and/or mop water – that is generated each day. The settling unit should be able to contain at least double or triple this daily volume.
- A method for removing the clear wastewater from the unit without disturbing the sludge on the bottom. A valve or spigot should be located no lower than half-way down the side of the unit.
- Strategy (method and frequency) for removing sludge from the bottom of the unit. Sludge should be removed on a regular basis, and never allowed to build up higher than ¼ of the container's height. Remove sludge only after draining off the clear wastewater on top. Sludge can either be removed from the bottom of the settling unit or scooped out by hand from the top. Removal may require a large opening with a secure cap (as sludge may clog a valve or spigot). Some shops use a container with a conical bottom to facilitate both settling and sludge removal.

In addition,

- Identify a location in the shop that is convenient but enough out of the way so that the settling unit will not be disturbed accidentally. The unit may be placed on the ground, or elevated.
- To settle wastewater for longer than overnight, consider a system comprised of several containers used in sequence.

Multiple Settling Units, In Series

A sequence of two or more settling containers is one way to increase settling time for the wastewater. For example, some shops construct their own tow-drum units. Wastewater is held in the first drum for 24 hours and allowed to settle; then the clear water on top is drained into the second drum for an additional 24 hours or more of settling prior to discharge to the sanitary sewer. (Be sure to follow sludge-removal precautions detailed in the previous section).

The decision to use a settling unit with a single container versus one with multiple containers may depend partly on the metals concentrations in the wastewater and the time required to allow the metals to settle out to acceptable levels. Also, there must be adequate space in the shop, in a convenient location, where the unit(s) will not be disturbed.

Testing Settled Wastewater

After installing a settling unit, be sure to have the settled wastewater tested at least twice to make sure the system allows for enough settling time. Overnight settling may be sufficient for some shops' wastewater, but others may require 48 or 72 hours of settling in order to comply with local discharge limits. An analytical lab should test the settled wastewater for zinc, nickel, and lead. The results should confirm whether or not enough there's settling time to ensure that the wastewater is acceptable for discharge.

Washing Cars

After bodywork is completed, some sanding dust often remains on the vehicle. When the car is washed, the dust is rinsed off and discharged with the wash water. Therefore, vehicle wash water from an auto body shop is typically contaminated with zinc and/or other metals, and it should not be discharged to the storm drain under any circumstances, or to the sanitary sewer without treatment. There are two options for discharge of vehicle wash water:

Option #1:

Wash vehicles and discharge the wastewater to the sanitary sewer through a permitted treatment system or recycling unit. An industrial waste discharge permit must be obtained in many jurisdictions for such a sewer discharge.

Option #2:

Collect the wash water and dispose of it offsite.

- For either option, also:
- Remove dust from the vehicle prior to washing. Be sure to check areas where dust might collect, such as the doorjambs, hood, and trunk. Try to keep the amount of airborne dust to a minimum.
- Make sure wash water does not run into a street, gutter, or storm drain.

Cleaning Floors

Sanding dust and wet-sanding drips often end up on the shop floor. If the shop floor is mopped and the mop water is discharged to the sanitary sewer, the mop water alone can cause a violation of local sanitary sewer discharge limits for zinc.

Instead of mopping, sweep the floors.

- If mopping must be done, follow this three-step procedure:
  1. Clean up all drips and spills with rags or other absorbent materials.
  2. Sweep or vacuum to pick up dust. (This should be a frequent routine.)
  3. Finally mop with a minimal amount of water. Do not let water run outside.
- Dispose of the mop water to the sanitary sewer through a drain or permitted treatment system. As an additional precaution, let the mop water settle overnight or longer (in a bucket or settling unit) prior to discharge.

Primers, Paints, and Painting

Primers in particular may contain significant amounts of zinc. A review of the Material Safety Data Sheets (MSDS) of primers shows that certain primers contain as much as 40 percent zinc phosphate by volume. It doesn't take much of these primers reaching the sanitary sewer for a shop to exceed local sanitary sewer discharge limits for zinc.

- Conduct all painting indoors, preferably in a pant booth.
- Review the MSDS of the products used and look for the zinc concentrations listed. Use primers and paints with lower zinc content if they work equally well.
- Befriend your vendor. They can be an invaluable source of information about new and versatile (low metal) paints, technologies, and industry trends.
- When cleaning auto body parts before painting, minimize use of hose-off degreasers. Brush off dirt and use rags to wipe down parts. If an acid-based metal cleaner or cleaner/conditioner is used to treat bare metal and rinse water is recommended to stop the chemical reaction, use as little water as possible and wipe down the area with a rag or towel.
- Reduce waste by using low-volume paint mixing equipment and high-efficiency painting tools.
- Minimize waste paint and thinner by carefully calculating paint needs based on surface area and using the proper sprayer cup size.
- Clean spray guns in a self-contained cleaner. The gun-cleaning solution, whether solvent or aqueous-based, should be recycled or disposed of properly when it becomes too dirty to use. Never discharge gun-cleaning solution to the sewer or storm drain.
- Do not use water to control overspray or dust in the paint booth unless it is sure to evaporate in the booth (so the dust can be swept up), or this wastewater is collected. The water should be treated prior to discharge into the sewer system.

Miscellaneous Tips

- When receiving damaged vehicles, inspect for leaks. Use drip pans if necessary.
- Conduct all body repair and painting work indoors.
- When cleaning wheels, avoid the use of acid-based wheel cleaners if soap and elbow grease will do.
- Never use spray-on, acid-based wheel cleaners in areas where rinse water may flow to a street, gutter, or storm drain. If acid-based products are used on a wash pad, the wash water may need additional treatment beyond oil/water separation to meet wastewater discharge limits.

Treatment Control BMPs

For information on inspecting and maintaining treatment controls, see Section 4 of this handbook.

For information on designing treatment controls, see Section 5 of the New Development and Redevelopment Planning Handbook.

More Information

Booklets, checklists, fact sheets, and pamphlets

Regional Water Quality Control Plant—Palo Alto, 1997. Water Pollution Prevention Practices for Auto Body Shops.

Videos

Sacramento County Environmental Management Department / California Department of Toxic Substances Control, 1994. Pollution Prevention for Auto Body Shops.

References

Bay Area Dischargers Association and Bay Area Storm Water Management Agencies Association, 1995. Your Shop Can Make A Difference!, What vehicle service shops can do to protect water quality in the Bay and Delta.

King County Surface Water Management Division, 1995. Storm Water Pollution Control Manual. Best Management Practices for Businesses. (http://dnr.metrokc.gov/wlr/dss/spcm.htm)

Regional Water Quality Control Plant—Palo Alto, 1997. Water Pollution Prevention Practices for Auto Body Shops.