

Best Management Practices

to reduce pollution

for Printing and Photoprocessing Operations

The San Jose / Santa Clara Water Pollution Control Plant has developed these Best Management Practices (BMPs) to reduce loadings of metal, wastewater and other toxic pollutants from Printing and Photoprocessing Operations to the sanitary sewer and storm drain systems, and the South Bay. Printing and photoprocessing operations process waters should never be discharged to storm drains, blacktop, streets or landscaping. We hope that you will join us in our efforts to protect the South Bay.

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HOUSEKEEPING

Good housekeeping practices are the first line of defense and should be considered in preventing pollutants from entering the sanitary sewer and storm drain systems.

1. Seal all floor drains connected to the sanitary sewer and storm drains in production areas.
2. Never discharge any process waters, mop water, cleanup water or other chemicals into outdoor storm drain inlets, blacktop, landscaping or other connections to the storm sewer system.
3. Never wash equipment or filters outdoors or in any area that could drain to the storm drain system.
4. Install secondary containment around all machines that may leak or drip fluids. Keep secondary containment clean and dry at all times. Do not leave open containers unattended unless they are within secondary containment.
5. If secondary containment is not feasible, use drip pans or absorbent materials to catch drips and leaks.
6. Promptly transfer used fluids to the appropriate waste receptacles or recycling drums. These should be secondarily contained and properly labeled.
7. Keep waste fluid segregated to facilitate reuse, recycling or treatment
8. Keep cleanup materials, such as absorbents and other equipment, handy at all times. Used absorbents should be placed in a properly labeled, tightly closed container.
9. Any equipment stored outdoors must be covered to prevent rainwater from carrying pollutants to the storm drain system.
10. Keep refuse bins covered and leak proof at all times.

Contact your local Fire Department and the County for specific handling, storage, and material management regulations of hazardous materials.

Floor Cleaning / Spill Cleanup

- ◆ Clean up spills immediately.
- ◆ Properly contain fluids to avoid spills.

Clean shop floors following these steps:

1. Use absorbent materials, such as rags, pigs, sock-type absorbents, pads or granular absorbents, to clean up or confine any fluids. Properly dispose of all used absorbent material.
2. Sweep floor of any debris.
3. Follow steps 1 and 2 above, and then mop floor if desired. Mop water may then be discharged directly to the sanitary sewer.
4. Keep your facility's Spill Response Plan updated and available. Be sure that all employees are familiar with the plan and are trained for spill response.

Discharging mop water to landscaping, blacktop, streets or storm drains is a violation of local and state laws.

Printing Plate Processing

1. Reduce the amount of waste rinse water by using countercurrent rinse tanks.
2. Replace solvent-based plate-making systems with water-based plate-making systems. Contact PINC for information.
3. Use automatic aqueous plate processors. This can optimize the use of plate-making solution and minimize waste.
4. Consider alternative plates, such as plastic or photopolymer, flexographic and electrostatic paper plates. Replacing metal plates will reduce the generation of hazardous chemical wastes and metal-bearing solutions.

Printing Image Transfer

1. Use soybean, walnut, or vegetable oil-based inks for lithography printing whenever possible to cut down on the use of solvent-based inks. Water-based inks can also be used for flexographic, screen printing and some letter presses. (Concentrated solvent and water-based inks containing metals must meet local limits prior to discharge to the sewer. (See discharge limits on page 20.)
2. Use soap or detergent solutions for cleaning inks and oils in lieu of solvents.
3. Clean ink trays with ink knives or rags; then rinse with water. Recover as much ink as is possible.
4. Fill ink fountains only enough for a particular run or shift. Return all unemulsified inks to their covered containers.
5. To minimize waste ink generation, clean ink fountains only when changing colors or when the ink might dry out between runs.
6. Install automatic ink levelers to keep ink fountains at their optimal level for good print quality in large web presses.
7. Run similar jobs simultaneously to minimize waste generation between cleanup and start of the next run.
8. Spray ink fountains with special nondrying aerosol materials when left overnight.
9. Dedicate presses to specific ink or pigment type uses when possible.
10. Save old inks and market as "house colors".
11. Donate unemulsified inks to trade schools, colleges, etc.

Disposal Options for Photochemicals

All commercial printers, photo processors and centralized radiology laboratories must apply for one of the following:

1. Zero Spent Solution Discharge Certification

Contract with a licensed hazardous waste hauler that can transport, store, treat, and/or recycle silver-bearing photographic waste according to local, state, and federal requirements.

Keep records of chemicals purchased, wastes generated and waste manifests.

For professional hazardous waste services, consult the "Yellow Pages" or call the Santa Clara County Environmental Health Department at (408) 299-6930.

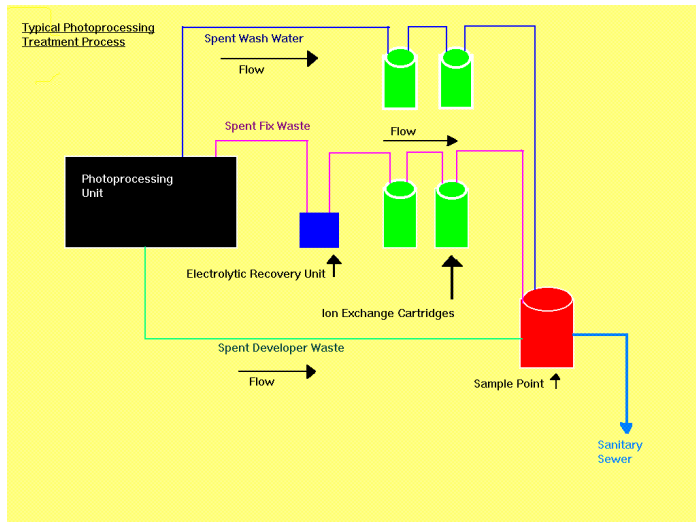
Businesses located in Santa Clara County, generating less than 100 kilogram (27 gallons or 220 pounds) of hazardous waste per month, are legally classified as Conditionally Exempt Small Quantity Generators, (CESQG). State law allows CESQGs to bring their hazardous wastes to government-sponsored drop-off programs. Examples of businesses that are allowed to generate small quantities of hazardous wastes include print shops, graphic art studios and dental offices.

2. Industrial Wastewater Permit

In order to treat and discharge spent silver-bearing wastewater to the sanitary sewer, you must apply for an Industrial Wastewater Discharge Permit to the SJ/SC WPCP ninety days prior to any intended discharge. All wastewater discharged to the sanitary sewer must meet local discharge limits. (see page 20)

To ensure that process wastewater does not violate these limits, all spent chemicals (except developer from photo and X-ray film processing operations) must be treated prior to discharge. This includes fixer, stabilizer, bleach, bleach-fix, and washwater.

A common waste treatment system for silver typically includes at least two metallic replacement (steel wool) cartridges in series which will often follow an electrolytic recovery unit. Your treatment system provider can usually dispose of spent cartridges and give you a rebate for the value of silver.



Wastewater Treatment Operational Suggestions:

- Ensure that the treatment system is serviced at recommended intervals and keep records of all servicing.
- Train your employees so that a person knowledgeable about the treatment system is present whenever it is in operation.
- Test the system for silver removal and determine optimum times for cartridge replacements. Future cartridge replacements may then be based on flow, square footage of film developed, or time-in-service.
- Include specific guidelines addressing disposal of waste material into all service contracts.

Never dispose of any chemicals or wastewater down a storm drain. Storm drains are channels for diverting surface rainwater from streets. All material that enters a South Bay storm drain will flow *untreated* directly to creeks and south San Francisco Bay.

TRAINING

1. Train all employees in:
 - Best Management Practices for Printing and Photoprocessing Operations outlined in this brochure.
 - Proper chemical handling, treatment, storage and disposal.
 - Spill Response.
 - Water conservation techniques.
 - Reading and understanding of Material Safety Data Sheets.
 - Treatment system operations and trouble shooting.
1. Keep your facility's Spill Response Plan updated and available to employees at all times.
2. Place signs on faucets reminding employees not to use water to clean up spills.
3. Label drains in your shop to indicate if they flow to a treatment system or directly to the sewer.
4. Join trade organizations and subscribe to trade journals to keep informed about regulations and pollution control technology.
5. Contact Environmental Enforcement at (408) 945-3000 to obtain stencils for labeling all storm drains.

Pollution Prevention Table for Photo Developing and Printing Processes

The following table presents some pollution prevention tips for image processing and image transfer:

Pollution Prevention Tips	Expected Effect	Remarks
<p>Assess the feasibility of using the following silverless films instead of the regular photographic films containing silver:</p> <ul style="list-style-type: none"> • Photopolymer film • Electrostatic film 	<p>Hazardous silver-bearing photoprocessing wastewater is not be generated.</p>	<ul style="list-style-type: none"> • Silverless films have slower speeds relative to silver halide films and hence limited application. • Carbon black is used as a substitute for silver in photopolymeric films. These films are processed in a dilute alkaline solution which can be neutralized and rendered non-hazardous before being discharged. • Electrostatic films have comparable speed and resolution as that of silver films. An electrostatic charge sensitizes these films and a liquid toner brings out the image.
<ul style="list-style-type: none"> • Install waterless paper and film developing units to eliminate the use of water. • Segregate fixer from developer. 	<p>No wastewater is generated in this application.</p>	<ul style="list-style-type: none"> • Spent material is collected and manifested off-site.
<p>Use squeegees in processing systems to wipe excess liquid from photographic films and papers. Pinch rollers and air knives have similar effect.</p>	<p>Minimize chemical carryover from process baths. This can prolong the lifetime of process bath and reduce the amount of replenishment chemicals required.</p>	<ul style="list-style-type: none"> • Squeegees should be used only after film images have been hardened. • Regular maintenance and replacement should be carried out.
<p>To extend life of fixing baths:</p> <ul style="list-style-type: none"> • add ammonium thiosulfate • use an acid stop bath prior to the fixing bath • add acetic acid to the fixing bath as needed to keep the pH low. • review options with your chemical, equipment vendors. 	<ul style="list-style-type: none"> • Maximizes raw materials usage and reduces amount of developing chemicals and paper used. • Adding acetic acid to the fixer bath keeps the pH low and maximizes the concentration of soluble complexes. 	<ul style="list-style-type: none"> • Adding ammonium thiosulfate doubles the allowable concentration of silver buildup in the bath. • Accurately adding and monitoring chemical replenishment of process baths will decrease the amount of chemicals spent during photoprocessing. It will also reduce the amount of low-quality results, thus, reducing additional film, paper, and chemical use and waste.

Pollution Prevention Tips	Expected Effect	Remarks
Install electronic imaging and laser plate making systems.	Editing on a video terminal reduces amount of waste film, waste paper and wastewater generated during image processing and image transfer.	Computerized “electronic pre-press systems” are available for image processing. Text, photos and graphics can be fed onto these systems through an electronic scanner and the copy can be edited on a display monitor.
Replace hazardous solutions used to dissolve unexposed non-image areas of flexographic plates with non-hazardous alternatives.	Reduces hazardous materials usage and the amount of hazardous waste generated during image transfer.	Flexographic plates may be processed using alcohol-based solutions as alternate for PCE. (Perchloroethylene, Perc)
Replace conventional lithographic plates with pre-sensitized plates.	Reduces the amount of waste generated during image processing and image transfer such as reject film, waste paper, and wastewater.	<ul style="list-style-type: none"> • Pre-sensitized lithographic plates are non-hazardous and can be recycled for their aluminum content. • Pre-sensitized plates may be processed with water without the need for hazardous developers. • Solutions used to develop photopolymer plates are typically not hazardous.

Spill Management

1. If a spill occurs, refer to the Housekeeping, Floor Cleaning section of this brochure (pages 1 - 3) for spill cleanup methods.
 2. Keep spill cleanup materials, such as absorbents, portable berms and shop vacuums, available and accessible at all times.
 3. Keep your facility's Spill Response Plan updated and available. Be sure that all employees are familiar with the plan and are trained for spill response.
- ◆ Berm working areas with curbing, similar to a concrete dike, so that spills can be easily contained for cleanup.
 - ◆ Use shop rags for small spills and absorbents for larger spills. Absorbents should be easily accessible anywhere in the shop and may require disposal as hazardous waste, if saturated. Contact your local Fire Department for further assistance.
 - ◆ Use drain mats or plugs to prevent spilled fluids from entering sanitary or storm drains, plus to help contain spilled fluids for cleanup. If possible, permanently seal or remove unused floor drains to prevent accidental discharge to the sewer system.
 - ◆ Place drip pans or absorbent mats under leaking equipment or where spills are likely to occur.

Materials Management

1. Obtain a Material Safety Data Sheet for each chemical used or stored in your facility. If applicable, determine whether you can use less toxic substitutes.
2. Order minimum amounts of materials and chemicals. This practice reduces waste and leftover materials when procedures are changed, expiration dates pass and spills occur, as well as minimizes severe problems in emergencies such as fire, earthquake, etc.
3. Inspect containers of raw material closely for leaks before accepting deliveries.
4. Return expired or off-spec materials to the vendors.
5. Use a "first-in, first-out" materials management policy (i.e. use the materials in the order that they were received) to make sure stockpiled materials do not expire before use.
6. Standardize the types of solvents and cleaning solutions used in the shop. Using the same fluids for as many applications as possible facilitates reuse, recycling, treatment, storage, and disposal.
7. Keep storage area clean and conduct daily inspections so that leaks and spills can be detected and stopped as soon as possible.

RECYCLING

1. Choose materials that can be recycled. Whenever possible choose inks, cleaning solutions, and other materials that are non-toxic. In some cases, water-based cleaners can provide acceptable re-cleaning. Avoid halogenated compounds, petroleum-based cleaners, and cleaners with phenol. These highly toxic materials can cause problems if discharged to the sewer and are often costly to recycle or dispose of.
2. Where possible, select suppliers who not only provide fresh materials but also accept the used materials for recycling, in order to “close the loop.”
3. Recycle or reuse spent fixer, solvents, water, lubricants and containers when possible.
4. Recycle waste ink. Most inks can be recycled or reused; they can often be blended to make black ink. Consider purchasing inks from a distributor who will take or buy back unused or spent inks.
5. Segregate your wastes to facilitate recycling.
6. Label waste barrels/drums to remind employees to separate wastes and to recycle. Include information such as contents, date accumulation starts, etc.
7. Strip “goldenrod” from negatives and accumulate for pickup and recycling by a licensed hauler. Accumulate “chromoliths” for recycling.
8. Retain used metal plates for pickup and recycling by a licensed hauler.
9. Collect waste paper and cardboard for pickup or delivery to a recycler.

For a list of recycling companies call the Environmental Services Department, Commercial Recycling Program at (408) 277-5533.

ALTERNATIVE PRODUCTS

1. Inks - Use soybean, walnut, or vegetable oil-based inks for lithography printing whenever possible to cut down on the use of solvent-based inks that cause employee and environmental hazards. Water-based inks can also be used for flexographic, screen printing and some letter presses.
2. Isopropyl alcohol - Use a fountain solution that contains low concentrations of isopropyl alcohol (IPA) or one that does not contain IPA.
3. Solvents - Use soap or detergent solutions whenever possible. Use solvents only for cleaning inks and oils.
4. Some specially made blanket washes containing less hazardous materials are now available.
5. Small solvent recovery systems are currently on the market and work well. Many medium and larger printers use them.
6. Many acetic acid-based solvents are on the market that are less toxic than other solvents.

Hazardous Waste Disposal Requirements

A waste is considered to be hazardous if:

1. It is specifically a listed hazardous waste as defined in the California Code of Regulations, Title 22,

OR

2. It exceeds the characteristic standards of ignitability, corrosivity, reactivity and toxicity as defined in Title 22.

- ◆ If not reused or recycled, hazardous wastes must be properly disposed of.
- ◆ Depending on the quantity of waste generated each month, a hazardous waste generator may be required to obtain an identification number, which registers the facility as a generator with the State of California or the US EPA. You may also be required to obtain a hazardous waste generator permit from the Hazardous Materials Compliance Division of the Santa Clara County Department of Health.
- ◆ CESQGs can bring their hazardous wastes to government-sponsored drop-off programs, administered by the Santa Clara County Environmental Health Department.

California Department of Toxic Substances Control

(DTSC) offers a consultant service program to help businesses understand hazardous waste regulations. This program provides both advice and regulatory clarity. For information on setting up a consultant appointment, contact Leif Peterson, DTSC Region 2.

SJ/SC Water Pollution Control Plant Maximum Allowable Discharge Limits

Pollutant	Maximum allowable concentration (mg/l)
Antimony	5.0
Arsenic	1.0
Beryllium	0.75
Cadmium*	0.7
Chromium, Total*	1.0
Copper*	2.7
Cyanides, Total*	0.5
Lead*	0.4
Manganese	35.0
Mercury*	0.01
Nickel*	2.6
Phenol & Derivatives	30.0
Selenium*	2.0
Silver*	0.7
Total Toxic Organics (TTO)	2.13
Xylene	1.5
Zinc*	2.6
Grease, Oils and Fats	150.0
pH	6.0 to 12.5

* *These pollutants are of particular concern due to their potential impact on the South Bay.*

All businesses in our service area must meet these concentration limits on discharges to the sanitary sewer.