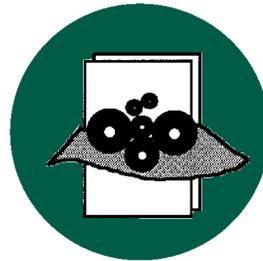


Printers Environmental Certification Workbook



Offset Lithography



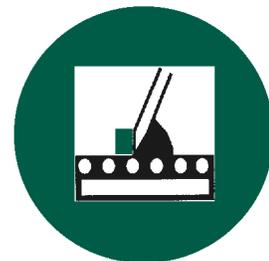
Flexography



Letterpress



Gravure



Screen Printing

For use with DEP's Environmental Results Program

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Trade Association Representatives

Mark Flannery, Director of Environmental Services, Printing Industries of New England
Gary Jones, Manager, Environmental, Health and Safety Affairs, Graphic Arts Technical Foundation
Marcia Kinter, Vice President, Government Affairs, Screenprinting & Graphic Imaging Association International
Doreen Monteleone, Director of Environmental Affairs, Flexographic Technical Association

Massachusetts Department of Environmental Protection (DEP)

Allan Bedwell, Deputy Commissioner
James Colman, Assistant Commissioner, Bureau of Waste Prevention
Marc Cohen, Business Compliance Division, BWP
Steven DeGabriele, Director, Business Compliance Division, Bureau of Waste Prevention
Tom Higgins, Office of Public Affairs
Dave Howland, Deputy Regional Director, BWP, DEP Western Region
Samuel Isaac, Compliance & Enforcement, BWP, DEP Western Region
Ed Kunce, Deputy Commissioner
Loretta Oi, Chief, Compliance & Enforcement, BWP, DEP Western Region
Tom O'Rourke, Permits Branch, BWP, DEP Western Region
Sal Resurreccion, Business Compliance Division, BWP
Laura Swain, Office of General Counsel
Alissa Whiteman, Environmental Results Program Manager
Nancy Wrenn, Communication & Education Services, BWP

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George Frantz, Senior Program Manager, Office of Technical Assistance for Toxics Use Reduction
Regina McCarthy, Executive Director, Toxics Use Reduction
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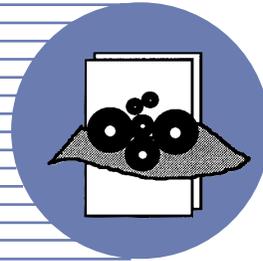
United States Environmental Protection Agency (EPA)

Tom D'Avanzo, New England Environmental Assistance Team
Anne Leiby, New England Environmental Assistance Team
Sally Mansur, New England Environmental Assistance Team

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The Environmental Results Program



We at the Massachusetts Department of Environmental Protection have fundamentally redesigned environmental regulation to be less costly and more effective. We are replacing the 25 year-old system of prescriptive case-by-case permits with annual comprehensive compliance certification and industry-wide performance standards.

This new common sense approach to regulation is the Massachusetts Environmental Results Program, an innovative regulatory system that we believe holds great promise for making it easier to meet – and surpass – Massachusetts' environmental standards. This approach, which was modeled after the pilot Massachusetts Printers Partnership, in which you may have participated, gives your business the information and flexibility you need to do the job, while improving accountability to the public for environmental performance.



The Environmental Results Program streamlines existing pollution control requirements for your printing shop by replacing individual air quality, industrial wastewater and hazardous waste permits with industry-wide standards. You will no longer be required to obtain approval for a new press or process change in advance of putting it into operation. In exchange, your shop will submit an annual certification of its compliance with the standards.

The workbook provides you with the information you need to understand and meet your environmental obligations. The greatest benefit to you and the environment will come from preventing pollution, typically from product substitution and other tips that are described in the workbook. You will find that pollution prevention may significantly reduce your regulatory burden, and, at the same time, save you money.

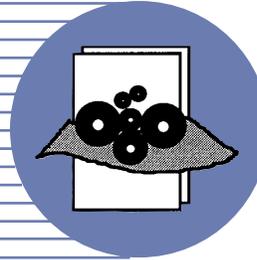
A list of workshops on how to use the workbook and complete the Compliance Certification is enclosed. I urge you to attend one of these sessions.

Thank you for your cooperation with this new approach to protecting the environment

A handwritten signature in black ink, appearing to read "David B. Struhs".

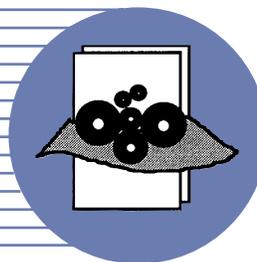
David B. Struhs
Commissioner
May 1998

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Section 1.0 Getting Started



Printers are part of the Massachusetts Department of Environmental Protection's (DEP) Environmental Results Program (ERP) designed to improve environmental protection at less cost to both government and business. ERP for printers eliminates most permits for approximately 3,000 Massachusetts printers by replacing them with a performance-based compliance certification. This workbook will explain what you will need to do in order to certify. If you have any questions, contact the DEP InfoLine 617-338-2255, or outside the 617 area code: 1-800-462-0444.



1.1 Who Is Subject to ERP for Printers?

ALL printers with printing operations with a primary Standard Industrial Classification (SIC) Code of 23, 26 or 27 or a primary North American Industry Classification System (NAICS) code of 323110, 323111, 323112, 323113, 323119, and 511XX are subject to the ERP standards. There are two exceptions.

You are a manufacturer or other business where printing is an ancillary operation.



You are a major source of air pollution (i.e., your facility has the potential to emit ≥ 50 tons per year of volatile organic compounds (VOCs) or ≥ 10 tons per year of any single Hazardous Air Pollutant (HAPs) or ≥ 25 tons per year for any combination of HAPs). In this case, you are required to have a Title V Air Operating Permit and you do not qualify for ERP at this time. However, if you comply with the ERP standards and recordkeeping requirements you can limit your potential to emit below these major source thresholds.

All printers, except those in these two categories, **must comply** with the standards in this workbook and complete the Self-Certification Form as instructed.



1.2 Pollution Prevention - First Step to Compliance.

The first step on the road to environmental compliance is to look for opportunities to use fewer hazardous materials and to generate less waste – stopping pollution at its source. Why manage wastes when you can eliminate them? Pollution Prevention (P2) techniques can help you reduce your compliance burdens, make your workplace cleaner and safer, increase your competitiveness and save you money.

This section outlines some easy first steps for you to take to prevent pollution. Then, after taking these steps and reducing your toxic use and waste generation as much as you

can, move along in the workbook to find out how you must manage your remaining wastes, emissions and discharges to be in compliance with ERP. If you need help about Pollution Prevention, call the Office of Technical Assistance (OTA) (617) 727-3260 or your trade association for more information.



1.3 Pollution Prevention Techniques for All Printers.

The following is a list of general P2 techniques that all printers should already be implementing to manage their health and environmental issues in a responsible manner, to take advantage of opportunities to reduce toxic use and waste generation, and to increase their competitive advantage.

ALL PRINTERS SHOULD

- Make one person (or a person in each department) solely responsible for chemical purchases and inventory control. Decisions should be made on a basis of: product performance, environmental and safety requirements, and cost. Store chemicals in a central location.
- Avoid purchasing similar chemical products from different suppliers. Conduct an inventory to reduce the number of chemical products used in your shop. Use multi-task products as much as possible.
- Track chemical use and wastes to identify reduction opportunities.
- Implement best management practices for the storage and handling of stock and materials. Spoilage and obsolescence of materials should be minimized. Use first-in, first-out management practices.
- Examine your use of materials by process. Are there new technologies that can replace your existing process and reduce toxics or waste? You may be able to save money or provide a new customer service.
- Clean containers as much as practical. Recycle the used containers or return them to the supplier or drum reconditioner.
- Give employees simple incentives to keep their work areas clean and minimize chemical use. Promote good housekeeping.
- Reduce your cleaning solvent usage by improving practices and solvent management. Avoid using flammable or F-listed solvents. (See page 39 for a list of F-listed solvents.) Cleaning solvents are a significant factor in VOC emissions and employee exposure.



1.4 Key Environmental Concepts

The standards contained in this workbook are designed to protect the environment from the following types of pollution.

Hazardous Waste

Hazardous waste is a chemical waste you intend to discard that is hazardous to public health and the environment when not handled properly.

For Printers, hazardous wastes include: press/screen cleaning solutions; untreated fixer; parts cleaning solvents; solvent-based inks, coatings or adhesives; and waste oil.

Industrial Wastewater Discharge

Industrial Wastewater is any wastewater resulting from any process of industry, manufacturing, trade or business, regardless of volume or pollutant content.

Discharge is the release of industrial wastewater to the waters of the Commonwealth through any source through pipes, sewers or other means.

For Printers, industrial wastewater include: film/plate processing wastewater; fountain solution; and water-based inks, coatings, or adhesives.

Air Emissions

Air Contaminant is any substance or man-made physical phenomenon in the open air space and includes: dust gas, fume, mist, odor, smoke, vapor, heat, sound, or any combination of these.

Volatile Organic Compound (VOC) is one type of air contaminant containing carbon and contributes to smog.

Air Emission is any discharge or release of an air contaminant to the open air space.

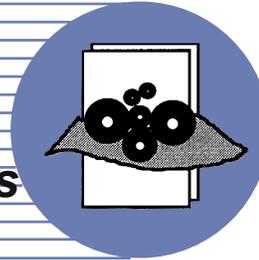
For Printers, air emissions originate from: press and screen cleaning solutions; inks; coatings; adhesives; alcohol; and alcohol-substitutes.



1.5 Releases or Spills Requiring DEP Notification

If you discover a spill of chemicals or hazardous waste, you may be required to notify DEP within two hours of discovery. Notification is required for environmental spills or releases (e.g., outside a building; on the ground; to a storm drain; or unlined trenches or sumps) in excess of reporting thresholds. A complete list of chemicals subject to the spill or release notification requirements and their reporting thresholds are provided in the state regulations (310 CMR 40.1600). If you have questions on the need to notify, please contact DEP at (617)-556-1133 or 1-888-304-1133.

**Section 2.0
Top Ten Tips for
Environmental Success**

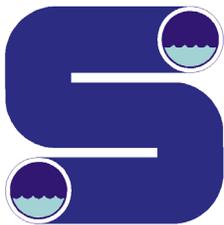


**Just Do
P2!**

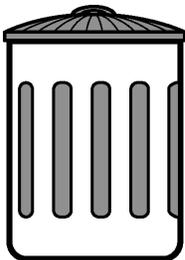
Pollution Prevention (P2) - First Step to Compliance. P2 techniques can be used to help you reduce your printer size category and eliminate the need to comply with certain ERP requirements for VOCs and recordkeeping. For more information, call the DEP InfoLine at (617) 338-2255, the Office of Technical Assistance at (617) 727-3260 or your trade association.

Silver = \$\$

Fix your fixer to meet the 2 ppm silver discharge. Save your silver. It's a recyclable precious metal. Silver recovery units and fixer and rinsewater recirculation systems reduce silver in the environment, conserve water, and can reduce your fixer purchases. You are required to meet 2 ppm silver when you haul or discharge photochemical wastes to a sewage treatment plant.



Say NO to septic systems. You are not allowed to discharge any industrial wastewater to your septic system. Sanitary discharges are OK. If you have a septic system, you are required to collect your industrial wastewater in containers and send it offsite to a licensed disposal facility or approved sewage treatment facility. For a list of licensed transporters, go to pages 43 through 45 at the back of this workbook.



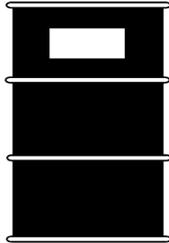
Don't throw it in the trash. Hazardous wastes should never be handled like regular trash. Accumulate them in appropriate containers for proper disposal. Nonhazardous wastes, such as corrugated cardboard, aluminum plates and scrap film are recyclable. Call the Office of Technical Assistance at (617) 727-3260 or WasteCap (617) 236-7715. Go to page 62 for additional resources.



Don't use shop towels for waste disposal. You should reduce the inks and solvents on your shop towels as much as possible. Shop towels saturated with solvent or inks must be handled as hazardous waste and cannot go to a commercial laundry.



Avoid F-listed cleaning solvents, if you can. These solvents are regulated as hazardous waste when disposed. They are also more toxic than other commercially available solvents. Go to page 39 for a list of the F-listed solvents.



Hazardous waste management — to manage is to control. Nothing can get you into trouble faster than a disorganized waste storage area. Label drums and keep them clean and closed. Maintain aisle spaces, post warning signs, and keep hazardous wastes separated from nonhazardous wastes and virgin materials. Only store hazardous waste in your shop as long as necessary, and use only reputable, licensed waste management facilities.



Prevent trouble — Walk, Don't Run! You should have emergency response procedures in place to ensure employee safety. Post emergency phone numbers at each phone near the work areas where hazardous waste is generated. Designate an Emergency Coordinator and instruct employees on whom to contact, what to do and not do, and how to evacuate the building.

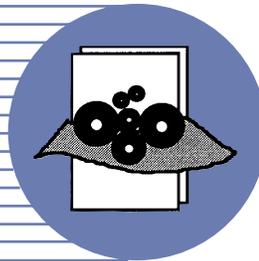


The air that we breathe. Volatile Organic Compounds (VOCs) in inks and solvents contribute to air pollution. Use environmentally friendly press cleaning solvents that evaporate more slowly. Use water-based, plastisol or UV inks, cleaning solutions, coatings, and adhesives whenever possible. Finally, use fountain solution substitutes instead of alcohol.

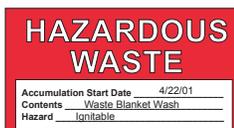


Records, records, records. You should keep your material purchase or usage records, hazardous waste manifests, MSDSs and other legally-required records on file. If you avoid using alcohol, and use water-based inks, coatings and adhesives, you gain the benefit of fewer recordkeeping requirements. An annual records review gives you an opportunity to find new ways to reduce toxics and wastes, and track the true cost of doing business. Good records also facilitate DEP inspections and expedite business sales and loans.

Section 3.1 Hazardous Waste in the Printing Industry



As a responsible business owner, you must manage your hazardous wastes in a safe and environmentally responsible manner. Federal and state regulations place the burden on you, as the generator, to properly dispose of the waste. You retain responsibility even when other companies handle and dispose of your wastes — this is your cradle-to-grave responsibility. By choosing products that are less hazardous, you may be able to avoid generating hazardous waste.



3.1.1 How Do You Know It's Hazardous?

As the generator, you are required to determine if a waste is hazardous or nonhazardous. You can do this by using your knowledge of the process and materials, by using available information like Material Safety Data Sheets (MSDSs), or by testing a representative waste sample. A licensed transporter can have your waste characterized for proper disposal. A list of transporters is provided in The Black Ink Room in the back of this workbook. You should complete a Waste Profile Sheet, describing the waste, and keep it on file.

If changes in your materials or printing operation cause the waste to change, then you are required to reevaluate it to ensure proper handling and disposal. Some transporters and disposal facilities may also require you to reevaluate your wastes each year.



3.1.2 Typical Printing Wastes and F-Listed Solvents.

Most hazardous wastes generated in the printing industry are ignitable, corrosive, or toxic. Some printers also use the “F- Solvents” in their inks or for press cleaning activities. Avoid using these solvents whenever possible because of their toxicity. Most solvents are considered Hazardous Air Pollutants. A full list of hazardous wastes and F-Solvents and their corresponding EPA Waste Codes are provided on page 39.



3.1.3 How Do I Determine my Generator Status?

First, you must determine how much hazardous waste you generate each calendar month. Use the example table to help you determine your monthly generation rate.

In the example table, Green Printing Company generates approximately 42 gallons of hazardous waste each month. Some months, more or less hazardous waste may be generated. The Green Printing Company should use the highest monthly generation rate.

Example Hazardous Waste Inventory for Green Printing Company

Activity	Waste	Hazardous?	Why?	Monthly Amount (gal)
Prepress	Untreated fixer	Yes	Toxic (> 5 ppm silver)	15
Pressroom	Waste cleaning solvents	Yes	Ignitable (FP < 140°F)	20
Pressroom	Waste nonheatset ink	No	Not toxic or ignitable	not counted
Pressroom	Waste solvent ink	Yes	Ignitable (FP < 140°F)	3
Pressroom	Waste specialty ink	Yes	Toxic (F-Solvent)	2
Postpress	Waste solvent adhesive	Yes	Toxic (F-Solvent)	2
Total Hazardous Waste Generated (gal/month)				42

To determine your hazardous waste requirements, you must select a generator category. In our example, Green Printing Company is classified as a Small Quantity Generator of hazardous waste.

Hazardous Waste Generator Status

Large Quantity Generator (LQG)  generates more than 270 gal/month

Small Quantity Generator (SQG)  generates between 27 and 270 gal/month

Very Small Quantity Generator (VSQG)  generates less than 27 gal/month



3.1.4 I Also Generate Waste Oil. Should I Count It?

If you generate waste oil in Massachusetts, you will have a separate waste oil generator status. The same generator categories (LQG, SQG and VSQG) apply to waste oil generation. Waste oil generator status is determined by your highest monthly generation rate. The same guidelines apply to waste oil storage as hazardous waste storage including, but not limited to, labeling and accumulation limits. For example, if Green Printing Company also generates 10 gallons of waste press oil each month, it would be classified as a SQG of hazardous waste and a VSQG of waste oil.



3.1.5 What If I Change my Generator Status?

If your generator status changes for hazardous waste and/or waste oil, you must request a Change of Status Notification Form from the DEP Compliance Assistance Line (617-292-5898). If your generator status changes from VSQG to SQG or LQG, you must also submit the "Application for USEPA Identification Number" form. Again, contact the DEP Compliance Assistance Line above. Be advised that frequent changes in generator status are not permitted. Select the highest generator status, even if you are in a lower category some of the time.



3.1.6 Do I Need a Generator ID Number?



Regardless of your generator status, every generator must notify DEP and have a unique site-specific hazardous waste generator ID number for use on shipping papers. If you do not have an ID number, call the DEP's InfoLine at (617) 338-2255 or 1-800-462-0444 to obtain the appropriate form for a generator identification number.



3.1.7 How Should I Store Hazardous Waste?

You are required to clearly label all hazardous waste containers and comply with the general requirements below.



FOR ALL HAZARDOUS WASTES, YOU MUST

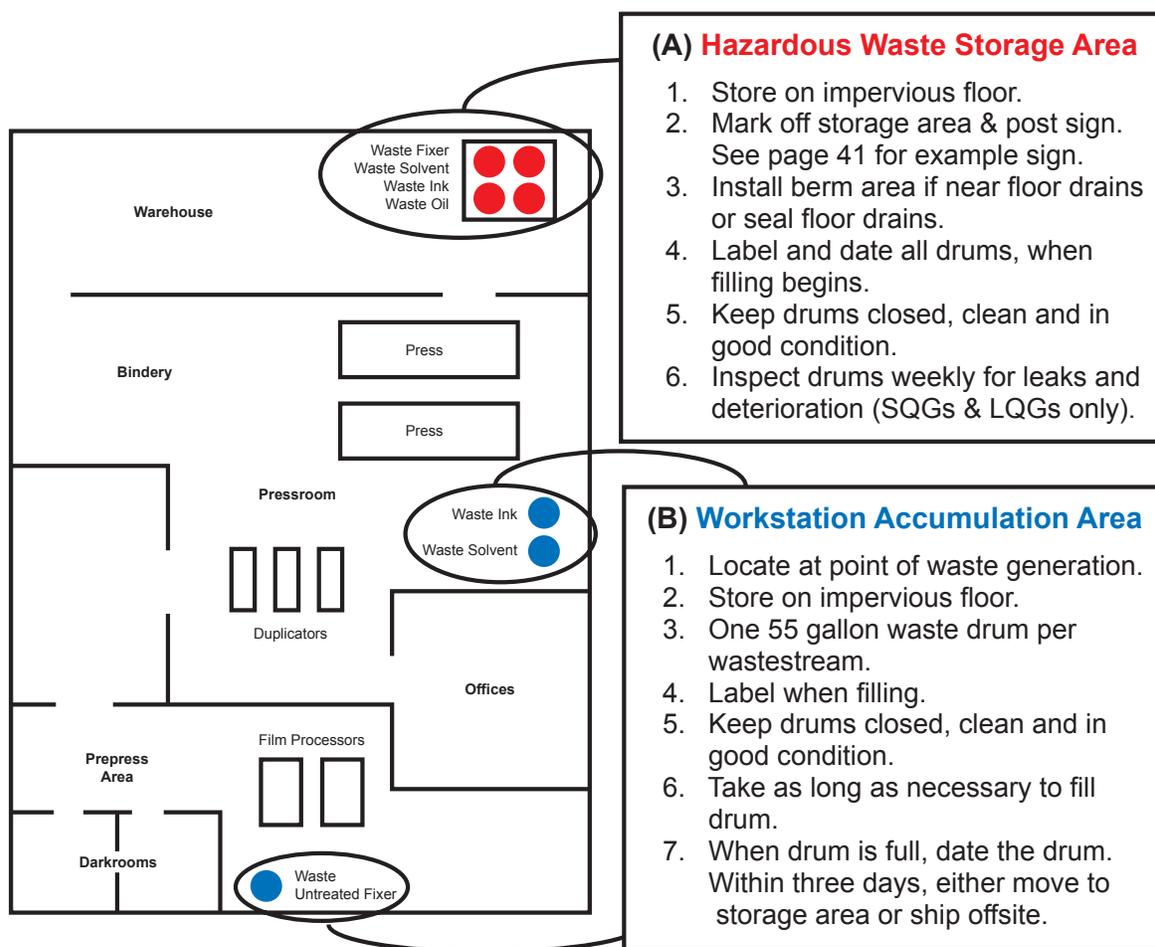
- 1  Label each container as "Hazardous Waste", the name of the waste (e.g. waste presswash), and the hazard (ignitable, toxic, or corrosive).
- 2  Do not mix nonhazardous and hazardous wastes, because the resulting mix of waste is still regulated as hazardous.
- 3  Provide sufficient aisle space to inspect containers – preferably three feet or more. If your space is limited, stack drums on pallets, except for flammable wastes, which cannot be stacked at all for fire safety reasons.
- 4  Keep containers closed, unless adding or removing wastes.
- 5  Store all ignitable and reactive wastes at least 50 feet from the property line, if possible.

YOU SHOULD ALSO KNOW

- Containers of flammable (flash point less than 100°F) solvents and hazardous wastes should be electrically grounded when materials are dispensed or added according to federal OSHA, the Massachusetts State Fire Marshal, and local building codes.
- Outside storage of chemicals and wastes is not recommended; additional hazardous waste storage requirements apply and you may need to get a federal storm water discharge permit. For assistance, call the DEP InfoLine (617) 338-2255 or 1-800-462-0444.
- The state plumbing code has requirements regarding the location of floor drains in proximity to hazardous material and waste storage. Check with a licensed plumber on whether floor drains must be sealed or relocated.

You can store hazardous waste in two ways: 1) in a designated hazardous waste storage area and/or 2) at workstations where hazardous waste is generated. See Figure 1 for how to store wastes in these locations.

Figure 1 Hazardous Waste Storage Requirements



3.1.8 What if I Carry My Untreated Fixer in Containers to My Silver Recovery Unit?

If you have a silver recovery unit (SRU) that is not directly connected to your processor, the containers of untreated fixer, bleach fix or stabilizer containing silver you carry to the SRU are regulated as hazardous waste. The containers must be stored according to the requirements in Figure 1 above. However, you do not have to count these wastes towards your generator status.



3.1.9 How Often Must I Ship my Hazardous Waste?

You are required to ship hazardous waste according to the generator accumulation limits below. The time period starts from the date placed on the drum or tank known as the accumulation date. Waste quantity limits at any one time are in parentheses.

Generator Accumulation Limits

Large Quantity Generator (LQG)		90 days from date on drum or tank (no quantity limit)
Small Quantity Generator (SQG)		180 days from date on drum or tank (1,650 gals total in tanks or drums)
Very Small Quantity Generator (VSQG)		No time period limit (275 gals)



3.1.10 How Must I Handle my Soiled Shop Towels?

There are two types of cleaning towels used by printers:

- Disposable wipes that are shipped offsite as nonhazardous solid waste or hazardous waste.
- Reusable shop towels that are returned to a commercial laundry.

Nonhazardous wipes can be disposed as solid waste. You are required to show that the wipes are nonhazardous— they do not contain any excess solvent or ink using the Paint Filter Test and are not ignitable, corrosive or contain toxic metals. If they are determined to be hazardous, then they must be shipped as hazardous waste by a licensed transporter.

You cannot send reusable shop towels to a commercial laundry with excess solvent or ink. If they are saturated, they are a hazardous waste.

To remove excess solvent, shop towels or wipes can be wrung out by hand or other mechanical compaction method, using proper personal protective equipment and procedures for combustible liquids. (It is not recommended that flammable solvents be recovered from towels or wipes without explosion-proof equipment.) Hand-wringing or mechanical compaction may be repeated until the towel passes the one-drop test. A rule of thumb regarding the one-drop test is to fold the towel in quarters; if you get solvent or ink on your hands after squeezing it, it is still saturated. (Solvent removed from towels or wipers should be collected for recycling or offsite disposal.) Air drying is not allowed, because it releases pollutants into the workplace and the environment.



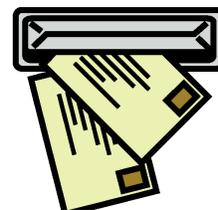
Don't use shop towels for waste disposal. Also, store them in closed containers. Train employees to properly dispose of ink and solvent in other designated containers. You should also train press operators not to use reusable shop towels to line ink trays. Scrape excess ink off press parts and ink fountains before cleaning with shop towels.



3.1.11 How Do I Ship Hazardous Waste?

You will need a licensed hazardous waste transporter to remove your hazardous waste and waste oil. Your transporter will provide you with a manifest for each waste shipment,

which may be preprinted, except for your signature. Check the manifest for accuracy (your ID number, type and quantity of waste). At shipment, you must sign it and keep Copy 6. For shipments by a generator to an out-of-state disposal facility, the generator should submit a photocopy of copy 3 to DEP within 30 days of receiving the copy from the disposal facility. The facility receiving your hazardous waste will send you a signed Copy 3 of the manifest within 45 days. (If not, contact the DEP Hazardous Waste Compliance Assistance Line at (617) 292-5898 for guidance.) Retain a fully executed Copy 3 for three years from the date the waste was accepted by the initial transporter.



SQGs and LQGs must also sign and keep a copy of the Landfill Disposal Restriction Form (a form for hazardous waste landfill disposal provided by the transporter). This is optional for VSQGs with transporter contracts for regular offsite waste shipments. This form should be stapled to Copy 3.

VSQGs may transport up to 55 gallons of their own waste to another hazardous waste generator without a manifest. A receipt for the waste must be kept on file.



3.1.12 Emergency Response for SQGs and LQGs.

To reduce the risk of fire, explosion, or spill of hazardous waste, SQGs and LQGs are required to have the following:

- 1  Designate an Emergency Coordinator. Should an emergency situation arise, the Emergency Coordinator must be prepared to react quickly and protect employees, emergency response personnel and the environment.
- 2^A/_B  Have a telephone or communication system near areas where hazardous waste is stored or generated to alert employees in an emergency. Post the emergency phone numbers and name of the Emergency Coordinator next to the telephone. See page 42 for sample emergency information sign.
- 3  Post evacuation route maps and exit signs in areas where hazardous wastes are handled or stored.
- 4  Have portable fire extinguishers and/or water supply for fires. Ensure adequate water pressure for the sprinklers. (Adequate water pressure can be determined during the annual sprinkler test required by OSHA and local fire departments.)
- 5  Make arrangements for emergency response with local responders (fire, police, etc.). If you can't, document your efforts that they elected not to respond to your request or refused to provide response services.



3.1.13 Universal Wastes.

To encourage environmentally sound recycling of these wastes, DEP has reduced the regulatory burden on printers.

- hazardous batteries, primarily nickel cadmium (NiCd) and button batteries;
- mercury-containing devices;
- mercury-containing lamps, such as fluorescent lamps; and
- hazardous waste pesticides.

They are considered Universal Wastes when sent off for recycling. (These wastes when disposed, are regulated as hazardous wastes if they meet the definition in Section 3.1.1).

Universal wastes must be stored in a separate area marked as a Universal Waste accumulation area. Containers of universal wastes or individual items must be labeled as: *e.g.*, Universal Wastes - Mercury-Containing Lamps. Printers must mark and label their containers and be able to demonstrate the length of time that the universal waste has been accumulated. There is an accumulation limit of one year.

For more information on used fluorescent lamp management go to:

<http://www.mass.gov/dep/toxics/stypes/flampbiz.htm>



3.1.14 Summary of Generator Requirements.

The requirements are summarized in a table for VSQGs and SQGs found on page 40.

ALL GENERATORS MUST

-  Determine whether your wastes are hazardous or nonhazardous.
-  Determine your hazardous waste and waste oil generator status.
-  Obtain your site-specific generator ID number.
-  Store your hazardous waste in accordance with Section 3.1.7. Be sure to label your waste containers properly.
-  Remove excess solvent from shop towels before shipping to a commercial laundry.
-  Segregate shop towel containers from other containers used for the disposal of inks and solvents. Do not use shop towel containers for waste disposal.
-  Keep a record of where your hazardous waste is shipped. Keep the manifests and receipts on file for at least three years. Landfill Disposal Restriction forms must be kept for five years. It is recommended that these documents be kept indefinitely.

(Requirements continued on next page.)

VERY SMALL QUANTITY GENERATORS MUST

-  Do all of the above requirements. AND
-  Store no more than 1,000 kg (2,200 lbs) approximately 250-275 gallons or up to 5 drums depending on the weight of the waste, at any time.
-  Use a licensed transporter to ship your hazardous waste and waste oil. Only VSQGs may self-transport up to 55 gallons of hazardous waste to another generator.

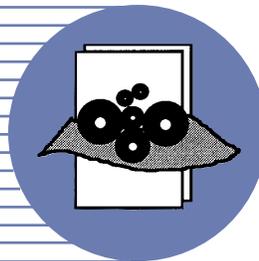
SMALL QUANTITY GENERATORS MUST

-  Do all of the above requirements. AND
-  Store no more than 6,000 kg (13,230 lbs), approximately 1,500-1,650 gallons or up to 30 drums depending on the weight of the waste, at any time.
-  Maintain a hazardous waste storage area according to Figure 1. Workstation Accumulation Areas are optional.
-  Date containers in hazardous waste storage area as soon as filling begins.
-  Conduct weekly inspections of hazardous waste storage areas and maintain a log of inspections of areas where containers are stored, looking for leaking and deterioration.
-  Ship hazardous waste and waste oil offsite within 180 days of the accumulation date on the tank or container.
-  Prepare for emergencies in accordance with Section 3.1.12.

LARGE QUANTITY GENERATORS MUST

-  Do all of the above requirements. AND
-  Ship hazardous waste and waste oil offsite within 90 days of the accumulation date on the tank or container. There is no limit on the quantity of hazardous waste stored at any time.
-  Prepare a written Hazardous Waste Training Plan and Contingency Plan. Annual employee training is required. The Contingency Plan must be sent to local responders (fire, police, and hospital) and a copy must be kept onsite. Call the DEP Hazardous Waste Compliance Assistance Line at (617) 292-5898 for guidance on what topics covered in the plans.
-  Submit a Hazardous Waste Generator Biennial Report every even numbered year.

Section 3.2 Wastewater in the Printing Industry



Your shop may generate industrial wastewater from several sources including: film and plate processing; spent fountain solution; and water-based inks, coatings, adhesives and cleaning solutions. The ERP standards for wastewater generated from printing operations target silver-bearing wastewater and dichromate cleaners. Your requirements depend on whether you are on a septic system or discharge to a sewer system.



3.2.1 What Can't I Do?

You are **NOT ALLOWED** to discharge any liquid industrial waste to a surface water body (e.g. streams, lakes, rivers), groundwater, or directly on the ground, without an industrial wastewater discharge permit from DEP and EPA. Call the DEP Infoline for guidance at (617) 338-2255 or 1-800-462-0444.



3.2.2 What If I Am on a Septic System?

You cannot discharge any liquid industrial waste to a septic system. You can discharge sanitary wastewater to an onsite septic system. You are required to ship offsite your photo-processing wastewater, waste fountain solution, process cleaning solutions and any other wastestreams from your prepress, press and postpress operations. If the industrial wastewater is not regulated as hazardous, you may be able to use a septage hauler.

You must comply with the requirements for wastewater storage in tanks or containers and offsite shipment of wastes. See pages 17 and 18 for specific requirements. If you have a silver recovery unit, you must maintain a record of the volume of silver-bearing wastewater treated by the silver recovery unit(s) for three years. See page 46 for worksheet.



3.2.3 Do I Need To Post Any Signs?

DEP recommends that you post a warning sign at every sink in the prepress, press, and postpress areas. Sample warning signs are provided on pages 48 and 49. One is used for shops on septic systems and the other sign is used for shops on sewers. Copy the signs as many times as needed. Place the sign in a sheet protector and post above the sink to remind employees not to dispose of process chemicals, solvents, waste inks, and hazardous wastes down the sink.





3.2.4 What Are My Requirements For Sewer Discharge?

You may discharge silver-bearing photoprocessing wastes to the sewer as long as they do not exceed the state-wide 2 ppm discharge limit for silver. However, if you have a wastewater discharge permit from your local sewer authority with a lower silver limit, you must meet the lower limit in your permit. See page 50 for a list of wastewater treatment plants.

For computer to plate imaging systems, sample wastewater for pH and if necessary to meet the state general prohibition not exceed a pH of 10.0, or to meet a more stringent local sewer authority requirement, install a pH neutralization system if wastewater is too basic.

YOU ARE NOT ALLOWED TO



Discharge or ship silver-bearing wastewater to a sewer treatment plant, if it exceeds 2 ppm silver.



Discharge or ship wastewater to a sewer treatment plant (solvents, solids, viscous materials, oxygen demanding pollutants, heated process water, etc.) that may cause a fire hazard or interfere with the local sewer treatment plant operations. Contact your local sewer authority for guidance.



Discharge wastewater from film and plate processing with a pH of less than 5.5 or greater than 10.0.



Discharge dichromate (chromic acid) film processor cleaners.



Discharge hazardous waste to the sewer.



3.2.5 I Discharge to the Sewer. What Type of Silver Recovery Unit (SRU) Should I Use?

Photoprocessing wastewater can be discharged to the sewer if it is pretreated to remove silver and meet the statewide limit of 2 ppm or any other local permit limit. Silver-bearing wastes include fixer and bleach-fix stabilizers. Film developer, rinsewater, and bleach are not considered silver-bearing wastes, unless contaminated with more than 2 ppm silver.

If you have a SRU, it must be of adequate design and capacity for your volume of silver-bearing wastewater treated. SRUs must be operated, serviced and maintained according to the manufacturer's specifications.

The most common SRUs are electrolytic, steel wool cartridges and ion exchange units. See Figure 2 for a typical SRU. They may be used separately or in combination, but an electrolytic SRU alone is not sufficient.

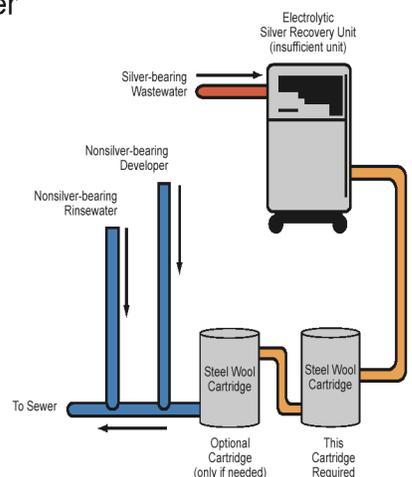


Figure 2 Typical Silver Recovery Unit

You do not need to be a certified operator for most SRUs (i.e., electrolytic or steel wool cartridges), lime chip neutralization or oil/water separators. (It is recommended that employees responsible for the operation of the other types of SRUs be trained by the manufacturer or supplier. Your local sewer authority may require you to document this training.)



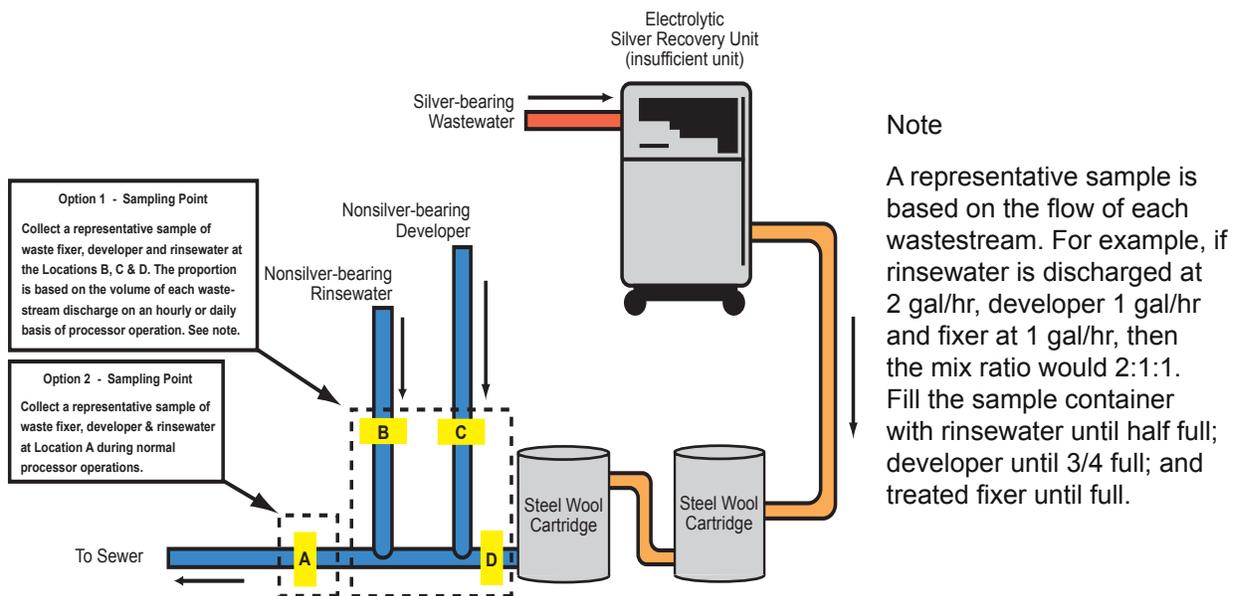
3.2.6 How Do I Sample For Silver?

For all SRUs, a representative sample of all photoprocessing wastes (that is, fixer, developer, and rinsewater) must be taken at least once a year at a location after the photoprocessing wastewater has gone through silver recovery and prior to combining with any other waste streams, including sanitary discharge. The sample must be taken within one month prior to changing the cartridges and analyzed by a state-certified laboratory, or you may take it with a commercially available self-sampling container, if it is analyzed by a certified laboratory.

If you have SRUs that use treatment technologies other than electrolytic and/or steel wool cartridges, then you must test the SRUs monthly. Call the DEP Infoline for guidance.

Figure 3 with explanatory note shows you where to collect a representative sample depending on accessibility to processor drain lines or the floor/sink drains.

Figure 3 Sample Collection Methods



3.2.7 What Happens If I Exceed The 2 ppm Silver Limit?

You are required to determine the cause and make whatever repairs, equipment changes, or operation changes to ensure compliance with the 2 ppm limit. If the SRU is not operating properly, do not discharge to the sewer. You may have to:

- Check your SRU(s) to ensure effective recovery of silver. Has the electrolytic unit been cleaned? Are the cartridges out of date? Has the volume of spent fixer exceeded the capacity of the SRU(s)?

- Check the processor. Are the squeegees properly adjusted? Did you change your photochemistry and not readjust the operating conditions?
- Add additional SRU capacity?
- Is the developer or rinsewater getting contaminated with fixer carryover?
- Can the processor be cleaned or adjusted? Do you need cartridges for the developer or rinsewater as well?



3.2.8 What Records Must I Maintain?

YOU MUST

-  Maintain a log(s) when each SRU is put into service, cleaned and serviced, including the change out dates for the spent cartridges. Date all cartridges when installed. See page 46 for sample log.
-  Record the SRU sampling dates and results.
-  Record the total amount of wastewater discharged and the total amount of wastewater treated by the SRU during the past 12 months.
-  Keep your SRU records and laboratory tests at least three years.
-  Keep MSDSs demonstrating that you are not using dichromate (chromic acid) processor cleaners.



3.2.9 Can I Store Nonhazardous Wastewater in a Holding Tank or Drums?

You can store wastewater in tanks, drums or containers. If the wastewater is a hazardous waste (i.e., contains > 5 ppm silver), it must be stored according to the hazardous waste requirements on pages 8 and 9. If it is nonhazardous:

FOR DRUMS & CONTAINERS, YOU MUST

-  Use containers that are approved by the USDOT for offsite shipment. (Such containers (greater than 5 gallons capacity only) are stamped or printed with the UN symbol and a 18-22 character alphanumeric code.)
-  Label the container indicating the contents are nonhazardous.

(Drums and container requirements continued on next page.)

- 3  Store the containers in a secure area with an impervious floor to contain leaks and spills.
- 4  Prevent spillage during filling, emptying or transporting the containers. If there are any spill releases to the environment, report them to the local Board of Health within 24 hours.
- 5  Keep records for three years on the volume shipped, the transporter name and address, dates of shipment and the destination(s).

FOR TANKS, YOU MUST

- 6  Have a tank constructed of a material that is compatible with the wastewater contents.
- 7  Locate the tank(s) in a secured area with an impervious floor to contain leaks and spills.
- 8  Have a secondary containment structure capable of retaining 110% of the total volume of all aboveground tanks.
- 9  Have odor control.
- 10  Label the tank indicating the contents are nonhazardous.
- 11  If tanks are remotely or automatically filled, they must have a bell and light alarm. The alarm must activate when the level reaches 75% of the tank capacity and be transmitted to a staffed location. Manually filled tanks must be provided with visual or sight glass level measurement.



3.2.10 Can I Use an Evaporator to Reduce My Wastewater Volume?

You can use an evaporator to reduce the volume of nonhazardous wastewater before shipping offsite. A separate permit is NOT REQUIRED. If you reduce the volume of hazardous wastewater in an evaporator, a separate DEP permit IS REQUIRED.

The evaporator sludge must be tested to determine if it is a hazardous waste that requires proper offsite shipment. Regardless, the test results should be kept on file.

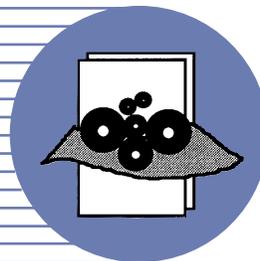


3.2.11 How Can I Ship Wastewater Offsite?

If your wastewater is hazardous, you must use a licensed transporter. See page 43 for a list of transporters. A precious metals transporter can transport silver-bearing wastewater and sometimes nonhazardous wastewater (developer and rinsewater). If the wastewater is nonhazardous, a septage hauler may take it to a sewer treatment plant (as long as you have written approval from the local sewer authority or treatment plant).

Section 3.3

Air Emissions in the Printing Industry



Volatile Organic Compounds, or VOCs, are chemicals that have been determined by the USEPA and DEP to cause air pollution and a public health impact. They contribute to the formation of ozone, a component of smog.

Where do VOCs come from? In printing, VOCs primarily originate from the printing inks, fountain solution additives (alcohols, etc.), platemaking (if solvent-based), press cleaning solvents and coatings. Solvent-containing solutions and coatings, alcohol and inks can evaporate during a pressrun or press cleanup.

Press and screen cleaning solvents are specifically formulated to clean and then quickly evaporate, leaving a dry blanket or screen. In contrast, nonheatset, water-based, plastisol and UV-cured inks are formulated to provide maximum absorption or polymerization on the paper, so very little ink solvent evaporates.



3.3.1 What is my Facility Emissions Status for VOCs?

You are required to determine your facility emissions status for VOCs – similar to determining your hazardous waste generator status. Your facility emissions status will determine what performance standards and recordkeeping requirements apply to your shop. To make your determination, you need to add up the amount that you purchased or used of:

- Press and/or screen cleaning solutions.
- Alcohol.
- Inks (including digital inkjet systems), coatings, and adhesives (See Important Note below for exceptions.)



IMPORTANT NOTE

DO NOT include: incidental materials; inks used in nonheatset offset lithographic printing; any inks/coatings/adhesives of less than or equal to 10% by weight VOC as applied; plastisol inks; or ultraviolet inks.

DEFINITIONS

Incidental Materials means VOC-containing materials that do not meet the performance standards (see Section 3.3.3) AND do not exceed 55 gallons in total quantity per rolling 12 month period.

Nonheatset Offset Lithographic Printing means offset lithographic printing in which the ink dries by oxidation and absorption into the substrate without heat from dryers or ovens.

Alcohol means ethanol, n-propanol and isopropanol used in fountain solutions.

Water-based Inks, Coatings and Adhesives have less than or equal to 10% by weight of VOC content as applied.

Plastisol Inks are dispersions of finely divided resin in a plasticizer.

Ultraviolet Inks are inks that dry by polymerization reaction induced by ultraviolet energy.

Rolling 12 Month Period means the last consecutive 12 month period of time.

Your facility VOC emissions status is based on a rolling 12 month period (see definition above.) Once you have collected the purchase or usage records for these products for the last 12 months, you can use the categories shown below to determine your facility emissions status. Refer to the Important Note on page 19 for materials excluded from the status determination.

Facility VOC Emissions Status

Small Printer



Purchased or used less than or equal to 275 gallons of clean-up solution, ink (including inkjet printing inks), adhesive and/or coating, and used less than or equal to 55 gallons of alcohol per rolling 12 month period.

Midsize Printer



Purchased or used between 275 and 3,000 gallons of cleanup solution, ink (including inkjet printing inks), adhesive and/or coating, and/or used more than 55 gallons of alcohol per rolling 12 month period.

Large Printer



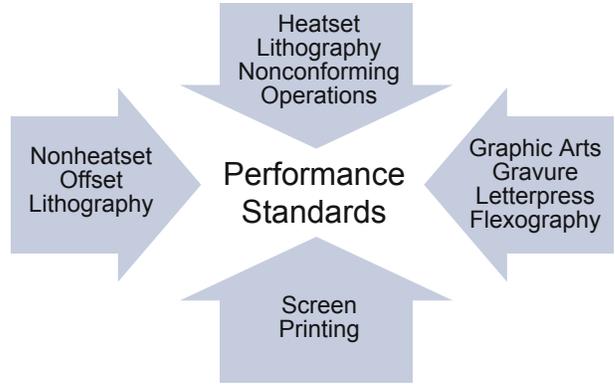
Purchased or used more than 3,000 gallons of cleanup solution, ink (including inkjet printing inks), adhesive and/or coating per rolling 12 month period.



3.3.2 What Are My Air Emission Requirements?

The air emission requirements can be divided into performance standards and record-keeping requirements. Please note that although there are no performance standards for digital inkjet systems, the amount of VOC-containing inks used in digital printing must be included in the size status determination for a Small, Midsize, or Large Printer.

The performance standards are specific to each of four categories of printing: 1) non-heatset offset lithographic printing; 2) graphics arts printing (gravure, letterpress and flexography); 3) screen printing; and 4) printers with heatset presses or nonconforming operations. You are required to evaluate your operations and then determine what categories apply to your shop. If you have printing operations that fall into two or more categories, the performance standards apply to those corresponding operations. For example, if you are a Midsize Printer with a nonheatset web and flexographic presses, the standards for both nonheatset offset lithographic printing and flexography would apply to your shop.



3.3.3 What Are the Performance Standards?

The performance standards are limits placed on the VOC content of the products you use – inks, press and screen cleaning solutions, fountain solution, coatings and adhesives. Table 1 summarizes the performance standards for press and screen cleaning solutions and applies to ALL PRINTERS. Table 2 applies only to Midsize and Large Printers.

Table 1: Performance Standards for All Printers

Vapor pressure is measured in millimeters of mercury (mm Hg).

	1 Nonheatset Offset Lithography	2 Graphic Arts Gravure Letterpress Flexography	3 Screen Printing
A Press or Screen Cleanup Solution	30% VOC or ≤ 10 mm Hg vapor pressure	≤ 25 mm Hg vapor pressure	≤ 5 mm Hg vapor pressure

Symbols

- < means less than
- > means more than
- ≤ means less than or equal to
- ≥ means more than or equal to

Table 2: More Performance Standards for Midsize and Large Printers

Values in VOC content as applied, not including water.

	1 Nonheatset Offset Lithography	2 Graphic Arts Gravure Letterpress Flexography	3 Screen Printing
A Printing Ink	Not Applicable	300 g VOC/L (2.5 lbs VOC/gal)	400 g VOC/L (3.3 lbs VOC/gal)
B Metallic Inks	Not Applicable	Not Applicable	400 g VOC/L (3.3 lbs VOC/gal)
C Conductive Inks	Not Applicable	Not Applicable	850 g VOC/L (7.1 lbs VOC/gal)
D Extreme Performance Inks/Coatings	Not Applicable	Not Applicable	800 g VOC/L (6.7 lbs VOC/gal)
E Coatings	Not Applicable	300 g VOC/L (2.5 lbs VOC/gal)	400 g VOC/L (3.3 lbs VOC/gal)
F Adhesives for postpress use	300 g VOC/L (2.5 lbs VOC/gal)	150 g VOC/L (1.25 lbs VOC/gal)	400 g VOC/L (3.3 lbs VOC/gal)
G Fountain Solution	Webfed Presses no alcohol Sheetfed Presses ≤ 5% VOC unrefrigerated ≤ 8% VOC refrigerated	Not Applicable	Not Applicable

NOTE: The sheetfed press performance standard for fountain solutions applies to only solutions with alcohol. Refrigerated means a constant temperature below 60°F. The standards do not apply to sheetfed or web presses with reservoirs having a capacity of less than one gallon of fountain solution.

IMPORTANT NOTE

The VOC content of your inks, cleanup solutions, fountain solution, coatings, and adhesives must be determined using EPA's Method 24, Method 24A (gravure inks only) or other calculation approved by DEP. If the product MSDS does not state the VOC content (or Percent VOC or Percent Volatility) determined by these methods, you should contact your supplier for the information. If the supplier cannot provide the VOC content by Method 24 or 24A, you should consider changing suppliers or contact DEP Infoline for guidance on alternative methods.



ALL PRINTERS MUST ALSO

- 1  Keep containers of press cleanup solutions closed at all times, except during dispensing or filling.
- 2  Keep shop towels soiled with inks and cleanup solutions in closed containers, when not in use.
- 3  Cover fountain solution mixing and storage tanks, except when adding or draining solution.



3.3.4 What If I Use Press Cleaning Solutions or Fountain Solutions in my Nonheatset Operations That Do Not Meet the Performance Standards?

You **MUST** modify your nonheatset operations to meet the performance standards for press cleaning solutions and fountain solutions.



3.3.5 What If I Cannot Meet One or More Performance Standards for Inks, Coatings or Adhesives?

If you are a Small Printer, then a separate permit for nonconforming operations is **NOT REQUIRED**. A Small Printer is still required to meet the performance standards for cleanup solutions.



DEFINITIONS

Conforming operation means an operation that uses raw materials that meet applicable performance standards in Section 3.3.3, Tables 1 and 2.

Heatset press means an offset lithographic printing press, where the solvent component of the ink is driven off with the use of heat from dryers or ovens.

Nonconforming operation means an operation that uses one or more inks, coatings or adhesives that **DO NOT** meet the performance standards in Section 3.3.3, Table 2.

Year means the last consecutive 12 month period.

If you are a Midsize or Large Printer, and you cannot meet one or more screen or graphic arts performance standards for inks, coatings or adhesives, you may be required to obtain a permit from DEP for those nonconforming printing operations.

If your total actual facility emissions are ≤ 10 tons VOC/year, then a separate permit for nonconforming operations is **NOT REQUIRED**. Refer to page 56 for how to calculate your total actual facility emissions. However, you must meet the performance standards in Section 3.3.6, Table 3 and the recordkeeping requirements on page 28.

If your total actual facility emissions are > 10 tons VOC/year, then a separate permit

IS REQUIRED. If you have two or more unpermitted presses that were installed at different times, you may not need a permit for the older presses. See page 56 for more guidance.

Regardless of your total actual facility emissions, you must be able to document that it is technically or economically infeasible to meet the performance standards and keep this analysis on file. (Technical infeasibility means your substrate or end product requires higher VOC content materials than allowed by the performance standard.) If your emissions are > 10 tons VOC/year, you must perform this analysis before initiating the permit process. If, during the permit application process, DEP determines that the nonconforming operations can be converted to meet the performance standards after all, then you will be required to do so. You will still be responsible for any permit application and DEP review fees, regardless of outcome.

Refer to Section 5.0, pages 35 and 36 for additional information on existing permits. If you need additional guidance on this issue, call the DEP InfoLine at (617) 338-2255.



3.3.6 What if I Have Unpermitted Heatset Presses?

If you are a Small Printer, then a separate permit for nonconforming operations is **NOT REQUIRED**. A Small Printer is still required to meet the performance standards for cleanup solutions.

If your total actual facility emissions are ≤ 10 tons VOC/year, then a separate permit for your heatset presses is **NOT REQUIRED**. (Refer to page 56 for how to calculate your total actual facility emissions.) You must still comply with the performance standards in Table 3 and the recordkeeping records on page 28.

Table 3: Performance Standards for Midsize and Large Printers with Unpermitted Heatset Presses or Nonconforming Screen or Graphic Arts Operations

Vapor pressure is measured in millimeters of mercury (mm Hg).

	1 Heatset Offset Lithography	2 Graphic Arts Gravure Letterpress Flexography	3 Screen Printing
A Press or Screen Cleanup Solution	30% VOC or ≤ 10 mm Hg vapor pressure	≤ 25 mm Hg vapor pressure	≤ 5 mm Hg vapor pressure
B Fountain Solution	Webfed Presses No Alcohol	Not Applicable	Not Applicable

If your total actual facility emissions are > 10 tons VOC/year, then a separate permit is **REQUIRED**. You must continue to comply with your existing permit (or obtain a permit, if you do not have one already). If you have two or more unpermitted presses that were installed at different times, you may not need a permit for the older presses. See page 56 for more guidance on this issue

Refer to Section 5.0, pages 35 and 36, for additional information on existing permits.



3.3.7 What If I Have Permitted Heatset Presses or Nonconforming Operations?

Refer to Section 5.0, pages 35 and 36, for additional information on existing permits.



3.3.8 What If I Use Fountain Solution?

DEP strongly recommends that all lithographic printers run alcohol-free. Alcohol is a VOC that contributes to smog. There are many alcohol-free fountain solutions available and you should contact your supplier to see if you can run alcohol-free.

A Small Printer does not have to meet performance standards for fountain solution.

Midsize and Large Printers **MUST** use alcohol-free fountain solution for webfed presses, and must keep the MSDS for the fountain solution to demonstrate that it is alcohol-free.

As a Midsize or Large Printer, you may elect to use alcohol, alone or in combination with alcohol substitutes, in your fountain solution for sheetfed presses. Sheetfed fountain solutions containing alcohol must not contain more than 5% VOC by weight for unrefrigerated solutions or 8% VOC by weight for refrigerated solutions.

You are required to demonstrate compliance with the 5% or 8% limits at all times, except when you elect to use weekly averaging. Weekly averaging to meet the 5% and 8% limits is only allowed at an individual press that occasionally requires higher alcohol content in the fountain solution.

If you elect to use this weekly averaging method at an individual press, you must use the following formula:

$$\text{VOC}_w = \frac{W_1\text{VOC} + W_2\text{VOC} + W_3\text{VOC}}{W_T} \times 100$$

Where: VOC_w = Weight percent of VOCs (must be less than the 5% or 8% limits)

$W_1\text{VOC}$ = Weight of VOCs in concentrate per week

$W_2\text{VOC}$ = Weight of VOCs in additive per week

$W_3\text{VOC}$ = Weight of VOCs added per week (usually alcohol, if any)

W_T = Total weight of fountain solution per week (includes water, concentrate & additives)



3.3.9 What Are Hazardous Air Pollutants?

Hazardous Air Pollutants (HAPs) are VOCs, toxic metal compounds or other chemicals that are considered hazardous to the environment and public health. HAPs are more strictly regulated by the EPA and DEP. See page 58 for the list of HAPs.

Most Small and Midsize Printers do not use products that contain HAPs in significant quantities. If you have HAP-containing products in significant quantities then you must determine whether you use ≥ 10 tons/year of any individual HAP or ≥ 25 tons/year of any combination of HAPs. This can be done using the HAP Worksheets on pages 52 and 53. If you exceed either limit, contact your nearest regional DEP office regarding special requirements applicable to major HAP users.

Large Printers are required to maintain records on HAP usage.



3.3.10 What Are My Recordkeeping Requirements?

The records you must keep are based on your facility VOC emission status as a Small Printer, Midsize Printer, or Large Printer. Small Printers must keep basic records, whereas Midsize and Large Printers must keep more detailed records.



ALL PRINTERS MUST



1 Keep all records onsite for at least three years and have them readily available for a DEP inspection.

SMALL PRINTERS MUST



2 Keep monthly purchase or usage records sufficient to demonstrate that you are a Small Printer. This includes inks, cleanup solutions, alcohol, coatings, adhesives. To show that you do not exceed the 55 gallon limit for incidental materials, keep purchase records for those materials on file. Purchase records are not required for inks/coatings/adhesives having $\leq 10\%$ VOC content by weight as applied, ultraviolet inks, plastisol inks and nonheatset offset lithographic inks.



3 Keep product Material Safety Data Sheets (MSDSs) on file for inks, coatings and adhesives having $\leq 10\%$ VOC content by weight as applied, and for cleanup solutions. (OSHA requires you to keep MSDSs for all of your products. If the MSDSs do not have the VOC content by Method 24 or the vapor pressure in mmHg, you must keep other records with this information. Call DEP for guidance on alternative methods to calculate the VOC content and vapor pressure.)

MIDSIZE PRINTERS MUST

- 4**  Meet the requirements 1, 2, & 3 to demonstrate that you are a Midsize Printer, AND
- 5**  Keep records of the % VOC content by weight for sheetfed alcohol-containing fountain solutions as measured each time alcohol (or alcohol mix) is used, based on the proportions of ingredients mixed, MSDSs, and/or supporting test data.
- 6**  Keep a log of daily temperatures for sheetfed fountain solutions containing alcohol, when the VOC content is $\geq 5\%$.
- 7**  Keep MSDSs for all fountain solutions (including alcohol-free solutions), inks, coatings and adhesives.
- 8**  Keep records of any additives, thinners, etc. used in ink, coatings and adhesives to demonstrate compliance with the performance standards. (Remember -- The performance standards for inks, coatings and adhesives are as applied on the press.)
- 9**  Keep any supporting calculations and spreadsheets for determining the calendar week average VOC content for alcohol-containing fountain solutions. See page 52 for sample worksheet.

LARGE PRINTERS MUST

- 10**  Meet the requirements 1 through 9 to demonstrate that you are a Large Printer, AND
- 11**  Keep records of your actual facility emissions of all VOCs and each HAP-containing compound per calendar month. See page 53 for sample worksheet. (For nonheatset lithographic inks, you can assume that only 5% of the inks' VOCs are emitted to the air. For heatset lithographic inks, assume that 80% of the inks' VOCs are emitted to the air. For all other inks, you must assume 100% of the inks' VOCs are emitted to the air.)

Recordkeeping For Self-Converted or Unpermitted Heatset and Nonconforming Operations

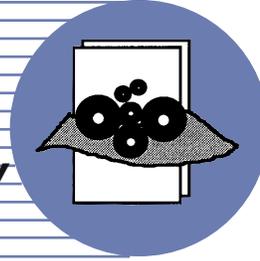
- 12  Keep records to demonstrate that your facility has ≤ 10 tons VOC/year actual facility emissions.
- 13  Keep records required for Large Printers.



IMPORTANT NOTE

Recordkeeping for unpermitted or self-converted heatset and nonconforming operations only applies to shops with actual facility emissions of ≤ 10 tons VOC/year per rolling 12 month period. (For more information on unpermitted presses and self-converting permits see Section 5.0 pages 34-36. All other heatset press and nonconforming operations must comply with any separate permit recordkeeping requirements.

Section 4.0 Pollution Prevention in the Printing Industry

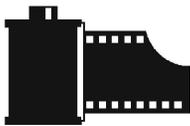


**Just Do
P2!**

Take this opportunity to look specifically at P2 techniques that are applicable to your shop area – prepress, pressroom and post-press – and to the type of printing you do. Review the techniques appropriate to your operation and use them to determine how well your existing environmental management practices compare to the best management practices (BMPs) in common use in other print shops like yours.

Each category begins with a list of techniques, which are low cost, common sense, best management practices that every printer in the category should already be implementing. Then P2 techniques are listed in each category that require increasing amounts of capital or employee training to implement. These techniques, while more challenging to implement, have been used by printers to lower costs of compliance and increase their competitive advantage. They may be cost-effective strategies for you to consider, if you have not already. To determine which level of P2 investment is right for you, refer to pages 60-61, which provides simple methods to help you calculate the costs and benefits of P2 techniques, including those not-so-obvious costs that impact the workplace and environment and are often hidden in your shop's overhead.

Prepress Operations (tray processing)



These techniques reduce your exposure to known toxic chemicals and will probably save you money.

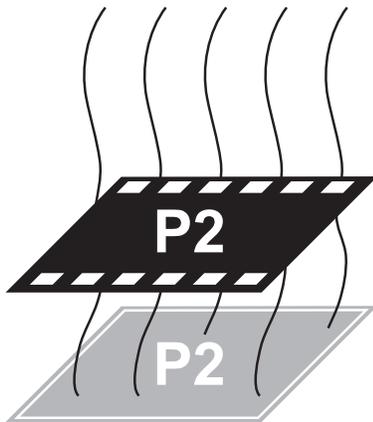
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1. Store temperature and light sensitive chemicals according to manufacturer's directions.
2. Avoid overstock of time-sensitive materials.
3. Recycle photographic film.
4. Look for nonhazardous intensifiers and reducers that do not contain mercury and cyanide salts.
5. Use formaldehyde-free photochemicals.
6. Use floating lids on the photochemical hand trays to reduce air exposure and maximize solution life.
7. For tray processing, use countercurrent washes. Use used rinsewater in the initial film wash and fresh water in the last rinse bath. When the last rinse bath needs changing, use it for the initial bath.

Prepress Operations (film, plate, screen)



These techniques help you reduce toxics, save water, and recover more silver to offset compliance costs.

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8. Change processor baths when no longer effective rather than on a fixed schedule. Test with a gray scale.
9. Extend bath life by adding replenisher to allow more silver buildup before treatment with a silver recovery unit.
10. Limit your exposure to aerosol products. If possible, use only nonhazardous aerosols, pumps or refillable bottles.
11. Set processors according to manufacturer specifications to minimize fresh water use, or install electronic valves for better water management and solution recirculation.
12. Use water-based plate developers.
13. Calibrate and adopt photoprocessor for proper chemical consumption. Periodically check/replace rubber rollers.
14. Install recirculation units for fixer, developer and rinsewater. An in-line SRU with a fixer recirculation system can prolong fixer usage.
15. Install metallic replacement cartridges after electrochemical SRUs to collect more silver. Two-stage SRUs can remove up to 99% of the total silver if properly maintained. Use ion exchange columns as a third stage (or for rinsewater), if your wastewater discharge must be free of silver.
16. Use water-based platen and screen adhesives to reduce VOC emissions.
17. Use direct-to-plate or digital prepress systems to eliminate the use of film processing. (Note: some computer to plate imaging systems may still use chemical developing solutions using silver halide or solvents.)

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Press Operations (general and lithographic)

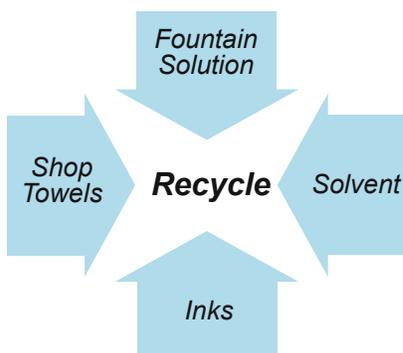
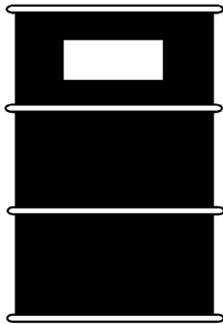


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18. Order only the amount of ink you need to do the job.
19. Reuse dirty solvent for the first noncritical cleaning step followed by cleaner solvent.
20. Use alcohol-substitutes in the fountain solution.

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These techniques rely on common sense business practices that can reduce environmental impact at little to no cost.



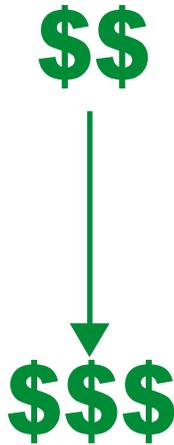
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21. Keep solvents in closed containers and wash baths.
22. Gravity drain or mechanically wring saturated shop towels to remove excess solvent.
23. Use spray or plunger cans for cleaning solvents.
24. Use spot application of solvents for stubborn ink residues rather than general over applying of solvent.
25. Use spray preservatives conservatively to prevent ink from drying in fountains overnight. *(This technique may result in higher startup wastes and should be compared to new non-skimming inks.)*
26. Keep ink containers covered to prevent skim over. Investigate new-non-skimming ink systems.
27. Scrape as much ink out of containers as possible. Scrape leftover ink from fountains for reuse or blending into black ink.
28. Use transfer pumps for press cleaning solvent drums to minimize spillage.
29. Use cleaning solvents that can be diluted with water before application. Conduct trials to find the best mix.
30. Obtain state and federal reports of blanket wash effectiveness and factsheets on how to evaluate them.
31. Reuse lightly soiled shop towels for noncritical cleaning.
32. Cover ink fountains on newspaper web presses.
33. Use alternative inks, such as vegetable-based inks.
34. Evaluate and use water-based cleaning solutions.
35. Use solvent sinks for parts cleaning to reduce once-used solvent cleaning of press parts.
36. Take leftover color inks and mix them for reuse by using software programs.
37. Evaluate alternative ink and presswash systems with lower VOCs or no VOCs for lithographic printing.
38. Install an explosion-proof centrifuge or dry cleaning units for wringing shop towels dry. (Most cost effective for mid-size and large users of shop towels.)

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Most printers recognize the importance of minimizing ink usage. Inks cost money. But these techniques require a more thorough cost/benefit analysis to determine feasibility.



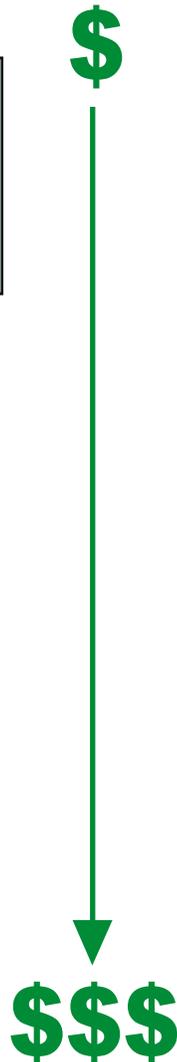
- 39. Recycle press cleaning solvent using a fully-enclosed solvent recovery system. *(May require a permit to operate.)*
- 40. Install ink recycling systems or use mobile systems provided by vendors.
- 41. Retrofit presses with automatic blanket washers or purchase new presses with these cleaning systems.
- 42. Install a fully-enclosed shop towel cleaning system.
- 43. Use UV-cured inks, electron-beam (ECB) inks or water-based inks when possible.

Press Operations (gravure/flexographic/screen)

JUST SAY NO TO TOXICS !!



These techniques are best suited for gravure, screen and flexographic printing operations. Some techniques will require patience and time to test their effectiveness and optimum operating practices. Other techniques require a preplanning effort, employee retraining, and a significant capital investment as well.



- 44. Use ink thinners with less toxic ingredients.
- 45. Use more effective, safer emulsion and haze remover products and avoid using degreasers.
- 46. Reclaim screens immediately after a print run using alternative screen reclamation chemicals.
- 47. Reclaim waste ink onsite or work out left over inks using computer software.
- 48. Enclose or cover ink fountains.
- 49. Use enclosed or angled doctor blades on rollers.
- 50. Reduce ink evaporation by using diaphragm pumps that heat inks less than mechanical vane pumps.
- 51. Install automatic ink jets to keep ink conditions optimal.
- 52. Use an evaporator to reduce the volume of nonhazardous waste ink or other water-based materials.
- 53. Use high pressure water cleaning of screens to eliminate degreasers and emulsion and haze removers. Install a water filtration system for ink particulates.
- 54. Use water-based inks with less than 10% VOC content. *(This may require large capital costs to retrofit presses.)*
- 55. Investigate UV/ECB curing systems.

Postpress Operations

These techniques eliminate toxic solvents and reduce your VOC emissions to the environment. Also, your employees will breathe better.



56. Use water-based, animal-based and hot-melt adhesives when possible.
57. Don't use adhesives containing F-listed solvents.
58. Avoid chlorinated solvents for cleaning adhesive residues. Use alternative petroleum solvents, if possible.
59. Use water-based coatings, UV varnishes and hot melt adhesives for in-line and off-line surface coating.

Solid Waste Opportunities

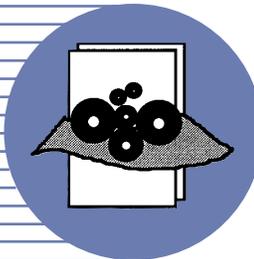


These techniques help you reduce nonhazardous solid wastes and offset your disposal costs.



60. Purchase raw materials in the largest container possible without promoting spoilage.
61. Require vendors to take back unused products.
62. Recycle used aluminum printing plates.
63. Clean ink containers as much as practical. Recycle the containers, if possible.
64. Purchase paper stock with preconsumer and postconsumer waste.
65. Minimize use of packaging materials for printed product when delivering to the customer.
66. Recycle all paper wastes. Segregate white and office paper from production paper wastes.
67. Recycle waste corrugated cardboard.
68. Recycle used or broken pallets.

Section 5.0 Existing Permits and Self-Certification



The ERP for printers is designed to replace most of the existing permits (air, wastewater and hazardous waste) previously required. However, there are still limited circumstances where a printer must retain an existing permit or obtain a new permit for expanding or changing certain operations.

This section addresses the most common scenarios with respect to existing permits. If you have a different circumstance or are under a Consent Order that conflicts with the ERP standards, you must call DEP for guidance.



IMPORTANT NOTE

You are required to complete the self-certification form, regardless of the permits you hold as a printer, with one exception. If you are a major source and require an operating permit, you are **NOT** subject to the ERP standards and must keep your permit.

DEFINITION REMINDER

Conforming operation means a printing operation that uses raw materials that meet applicable performance standards in Section 3.3.3, Tables 1 and 2.

Nonconforming operation means a printing operation that uses one or more raw materials that do not meet the performance standards in Section 3.3.3, Table 2.

Year means the last consecutive 12 month period of time.

Self-Converted Operations are operations where the printer has the option, and elects, to comply with the ERP standards instead of an existing permit. See scenarios 1 and 2 on page 35 for when you can self-convert.





5.1 Air Emissions.

Scenario 1 - I have a permit for existing conforming and/or nonheatset operations.

Permits are no longer required for nonheatset offset lithographic printing, screen printing, and graphic arts printing that conform to the performance standards in Tables 1 and 2 on pages 21-22. Printers who hold existing permits for such operations must now:

- Comply with the ERP standards. The permit(s) for these operations will no longer apply.

In the event that you did not obtain permits for some (or all) conforming or nonheatset operations, you must comply with the ERP standards.

Scenario 2 - I have a permit for existing nonconforming and/or heatset operations.

If your total actual facility emissions are ≤ 10 tons VOC/year (based on raw material usage only), then the permit is NO LONGER REQUIRED. Printers who hold existing permits for those operations have two options.

- Comply with the ERP standards. (See Section 3.3.5, page 23.) The permit(s) for these operations will no longer apply. **OR**
- Comply with the terms and conditions of the permit. Remember, you must still self-certify.

If your total actual facility emissions are > 10 tons VOC/year (based on raw material usage only), then you must continue to comply with your existing permit(s) for the nonconforming and heatset operations. Remember, you must still self-certify.



IMPORTANT NOTE

If you have a permit(s) for any combination of conforming, nonconforming or heatset operations, follow the examples in Scenarios 1 and 2 above.

Scenario 3 - I have a facility with ≤ 10 tons VOC/year (based on either raw material usage or restrictions contained in a permit) and intend to install a nonconforming or heatset operation.

To see if your total actual facility emissions are \leq or > 10 tons VOC/year, see Section 1.0 in the guidance on page 56.

If your total actual facility emissions, including actual emissions from the new operation (i.e., calculated actual emissions for the new operation based on projected raw materials used only), remain ≤ 10 tons VOC/year, then you can install the new operation without obtaining a permit, and the new operation must comply with the ERP standards in Table 3, page 24, and the recordkeeping requirements on page 27 and 28. Any other nonconforming

or heatset operations you add in the future that result in total actual emissions >10 tons VOC/year will **REQUIRE** you to either apply for a permit, or modify an existing plan approval or Restricted Emission Status (RES) permit as applicable for those operations only. Refer to Section 4.0 of the guidance on page 57.

If your total actual VOC emissions (including actual emissions from the new operation, i.e. calculated actual emissions based on projected raw materials used only) exceed 10 tons VOC/year, then you must either apply for a permit or modify an existing plan approval or RES permit for that new non-conforming or heatset operation.

Scenario 4 - Do I still need to fill out the DEP Source Registration form?

If you are a Small or Midsize Printer, you do not have to complete the Source Registration form, unless other applicable fuel utilization equipment thresholds are exceeded (i.e., boiler with a rated heat input equal to or greater than 10 MMBtu/hr).

If you are a Large Printer and you have total facility emissions ≤ 25 tons VOC/year, you do not have to complete a Source Registration form. However, you will be required to provide some emissions data on the Self-Certification form in place of the Source Registration form.

Large Printers with total facility emissions over 25 tons VOC/year are still required to complete the Source Registration Form.

Scenario 5 - Do I still need a DEP Permit for my boiler?

You must continue to comply with your existing permit(s) for boilers and other fuel combustion equipment in your facility. If you do not have a permit or are uncertain about needing one, call the DEP InfoLine for guidance at (617) 338-2255 or 1-800-462-0444. Please note that DEP currently regulates boilers constructed on or after September 14, 2001 with heat inputs between ≥ 10 MMBtu/hr and < 40 MMBtu/hr through the ERP Self-Certification Program. These boilers must burn natural gas or red dye distillate oil. Information is available on the DEP website at <http://www.state.ma.us/DEP>.

Notwithstanding the ERP boiler certification program, you must obtain a permit before you install the following:

- A boiler with a heat input ≥ 40 MMBtu/hour;
- A boiler with a heat input of > 5 MMBtu/hour burning 1% sulfur fuel; or
- A boiler with a heat input of > 3 MMBtu/hour burning $> 1\%$ sulfur fuel.

For combustion equipment or equipment that use fuels other than natural gas, liquefied propane gas, petroleum fuels (Nos. 1 through 6), call the DEP InfoLine for guidance.

The following combustion equipment do not need a permit.

- An emergency generator that has a heat input of < 3 MM Btu/hour and was installed prior to March 26, 2006 does not need an individual permit. See

the Environmental Results Program (ERP) engine and turbine regulation cited at 310 CMR 7.26(40) for an emergency generator installed on or after March 26, 2006.

- No permit is required for an emergency generator that has a heat input of >3 MMBtu/hour and ≤10 MMBtu/hour, and is used <300 hours per 12 month rolling period installed prior to March 26, 2006. You need to keep records on equipment specifications, fuel usage, operating hours, and service activities. For more information see, 310 CMR 7.03(10). On or after March 26, 2006, any emergency or standby engine with a rated output equal to or greater than 37 KW, or an emergency turbine less than 1 MW, are subject to the ERP cited at 310 CMR 7.26(42).
- A boiler that has a heat input of <3 MMBtu/hour does not need a permit.
- A boiler that has a heat input of ≥3 MMBtu/hour must be inspected and maintained according to manufacturer recommendations. The boiler must be tested annually and the test results posted near the boiler.



5.2 Wastewater.

Scenario 1 - I have an Industrial Wastewater Permit (IWWP) for my prepress, printing, coating and bindery operations.

This permit is NO LONGER REQUIRED. Comply with and self-certify to the ERP standards.

Scenario 2 - I have a Holding Tank Permit for Nonhazardous Industrial Wastewater.

This permit is NO LONGER REQUIRED for aboveground storage tanks. Comply with and self-certify to the ERP standards. A permit is STILL REQUIRED for underground storage tanks.



5.3 Hazardous Waste.

Scenario 1 - I have a Class A Recycling Permit for a stand alone silver recovery unit.

This permit is NO LONGER REQUIRED. Comply with and self-certify to the ERP standards.

Scenario 2 - I have a Class A Recycling Permit for a solvent recovery system.

This permit is NO LONGER REQUIRED. If you maintain and operate a solvent recovery system such as a solvent still, you can contact the DEP infoline and obtain a factsheet indicating the performance standards. Comply with these performance standards and self-certify to the ERP standards.

Scenario 3 - I have a Class A Recycling Permit for sending waste oil offsite for fuel blending and energy recovery.

This permit is STILL REQUIRED. Comply with the permit requirements and self-certify to the ERP standards.



Common Environmental Abbreviations

BWP	Bureau of Waste Prevention, DEP	MSDS	Material Safety Data Sheet
DEP	Department of Environmental Protection (Massachusetts)	MWRA	Massachusetts Water Resources Authority
EOEA	Executive Office of Environmental Affairs	OSHA	Occupational Safety and Health Administration (Federal)
EPA	Environmental Protection Agency (Federal)	OTA	Office of Technical Assistance
°F	Fahrenheit	ppb	Parts per billion
FP	Flash Point	ppm	Parts per million
HAP	Hazardous Air Pollutant	P2	Pollution Prevention
H ₂ O	Water	RCRA	Resource Conservation and Recovery Act (Federal)
IPA	Isopropyl alcohol	SRU	Silver Recovery Unit
kg	Kilogram	SQG	Small Quantity Generator
LDR	Land Disposal Restriction	TCLP	Toxicity Characteristic Leaching Procedure
LQG	Large Quantity Generator	tpy	Tons per year
mg/L	Milligrams per Liter	UV	Ultraviolet light
MGL	Massachusetts General Law	VOC	Volatile Organic Compound
mm	Millimeter	VSQG	Very Small Quantity Generator

Common Regulatory Terms

Digital Ink Printing	Transferring digital files to an output device that applies liquid inks to a substrate.
Gravure Printing	An intaglio printing operation in where ink is transferred from wells on a plate to the substrate by pressure, with excess ink removed from the surface of the plate by a doctor blade. This term also includes die stamping operations.
Flexographic Printing	A printing system utilizing a flexible rubber or elastomeric image carrier in which the image area is raised relative to the non-image area. The image is transferred to the substrate through first applying ink to a smooth roller which in turn rolls the ink onto the raised pattern of a rubber or elastomeric pad fastened around a second roller, which then rolls the ink onto the substrate.
Letterpress	A method where the image area is raised relative to the non-image area and the ink is transferred to the paper directly from the image surface.
Heatset Press	An offset lithographic printing press, where the solvent component of the ink is driven off with the use of heat from dryers or ovens.
Flash Point	The temperature at which vapors from a solvent/solid will ignite. The lower the flash point the more flammable the solution.
Vapor Pressure	A method of measuring the rate of evaporation of a solution. The higher the vapor pressure the faster it evaporates. Usually provided in mm Hg (mercury).
Performance Standards	Standards for vapor pressure or VOC content that apply to inks, coatings, adhesives, fountain solution, or press/screen cleaning solutions.
Conforming Operations	A press or presses that meet the performance standards.
Non-Conforming Operations	A press or presses that use ink, coating, or adhesive which does not meet the performance standards and the printer has demonstrated that it is technically or economically infeasible to use ink, coating, or adhesive that meets those standards.
Extreme Performance Ink	An ink/coating used in screen printing on a nonporous substrate designed to withstand any of the following:: more than two years of outdoor exposure; exposure to industrial-grade chemicals, solvents, acids, or detergents, oil products, cosmetics; temperatures exceeding 76°C (170°F); vacuum forming; embossing; or molding.
Hazardous Air Pollutants	An air contaminant listed by EPA as a HAP, pursuant to 42 U.S.C. 7401, § 112 and found to be hazardous to public health and the environment.
Silver-bearing Wastewater	Wastewater containing more than 2 ppm silver before any treatment.
Silver Recovery Unit (SRU)	A small, onsite treatment system specially designed to remove silver from wastewater.



(Typical printer wastes by EPA Waste Code are bold.)

- D001** Ignitable: Has a flash point of 140°F or less.
- D002** Corrosive: Liquids that easily corrode materials or human tissue and have a pH less or equal to 2 or greater than or equal to 12.5.
- D003 Reactive: Potentially explosive or produces toxic gases when mixed with water, air or other incompatible materials.
- D004 - D043** Toxic by the laboratory test, Toxicity Characteristic Leaching Procedure (TCLP). Refer below.

Compound	Waste Code	Regulatory Level (ppm)	Compound	Waste Code	Regulatory Level (ppm)
Arsenic	D004	5.0	Hexachlorobenzene	D032	0.13
Barium	D005	100.0	Hexachloro-1,3-butadiene	D033	0.5
Benzene	D018	0.5	Hexachloroethane	D034	3.0
Cadmium	D006	1.0	Lead	D008	5.0
Carbon Tetrachloride	D019	0.5	Lindane	D013	0.4
Chlordane	D020	0.03	Mercury	D009	0.2
Chlorobenzene	D021	100.0	Methoxychlor	D014	10.0
Chloroform	D022	6.0	Methyl ethyl ketone	D035	200.0
Chromium	D007	5.0	Nitrobenzene	D036	2.0
o-Cresol	D023	200.0	Pentachlorophenol	D037	100.0
m-Cresol	D024	200.0	Pyridine	D038	5.0
p-Cresol	D025	200.0	Selenium	D010	1.0
2,4-D	D016	10.0	Silver	D011	5.0
1,4-Dichlorobenzene	D027	7.5	Tetrachloroethylene	D039	0.7
1,2-Dichloroethane	D028	0.5	Toxaphene	D015	0.5
1,1-Dichloroethylene	D029	0.7	Trichloroethylene	D040	0.5
2,4-Dinitrotoluene	D030	0.13	2,4,5-Trichlorophenol	D041	400.0
Endrin	D012	0.02	2,4,6-Trichlorophenol	D042	2.0
Heptachlor	D031	0.008	Vinyl Chloride	D043	0.2

F-Listed Solvent Hazardous Wastes

(Typical printer solvents and EPA Waste Codes are bold.)

F-Listed Solvents contain 100% of an individual solvent or ≥10% when in combination with other F-Listed Solvents.

- F001 Halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons.
- F002 Halogenated solvents: **tetrachloroethylene**, **trichloroethylene**, **methylene chloride**, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,1,2-trifluoroethane, orthodichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane.
- F003 Ignitable nontoxic solvents: **xylene**, **acetone**, ethyl acetate, **ethyl benzene**, ethyl ether, methyl isobutyl ketone (MIBK), n-butyl alcohol, cyclohexanone, and **methanol**.
- F004 Toxic non-halogenated solvents: cresols, cresylic acid, and nitrobenzene.
- F005 Ignitable toxic solvents: **toluene**, **methyl ethyl ketone (MEK)**, carbon disulfide, isobutanol, **benzene**, pyridine, 2-ethoxyethanol, and 2-nitropropane.



If Your Generator Status Is		Then Your Requirements Are											
		Hazardous Waste Accumulation Limits				Waste Oil Accumulation Limits				Compliance Requirements			
Hazardous Waste	Waste Oil	Time (days)	Quantity (kg)	Time (days)	Quantity (kg)	Hazardous Waste	Manifest Self Transport	Accumulation Area	Emergency Standards	Written Training & Preparation of Contingency Plan			
LOG	LOG	90	NO LIMIT	90	NO LIMIT	YES		YES			YES		
LOG	SQG	90	NO LIMIT	180	6,000	YES		YES			YES		
LOG	VSQG	90	NO LIMIT	NO LIMIT	1,000	YES ¹	YES(WO)	YES			YES		
LOG	NONE	90	NO LIMIT	N/A	N/A	YES		YES				YES	
SQG	LOG	180	6,000	90	NO LIMIT	YES		YES			YES		
SQG	SQG	180	6,000	180	6,000	YES		YES			YES		
SQG	VSQG	180	6,000	NO LIMIT	1,000	YES	YES(WO)	YES			YES		
SQG	NONE	180	6,000	N/A	N/A	YES		YES			YES		
VSQG	LOG	NO LIMIT	1,000	90	NO LIMIT	YES ¹	YES(HW)	YES			YES		
NONE	LOG	N/A	N/A	90	NO LIMIT	YES		YES			YES		
VSQG	SQG	NO LIMIT	1,000	180	6,000	YES ¹	YES(HW)	YES			YES		
VSQG	VSQG	NO LIMIT	1,000	NO LIMIT	1,000	YES ¹	YES	YES					
VSQG	NONE	NO LIMIT	1,000	N/A	N/A	YES ¹	YES	YES					
NONE	SQG	N/A	N/A	180	6,000	YES		YES			YES		
NONE	VSQG	N/A	N/A	NO LIMIT	1,000	YES ¹	YES	YES					

¹ A manifest must be used for the VSQG category, unless self transported.

Definitions: **Regulatory Status** **Pounds Hazardous Waste/Month** **Conversions: Kilograms** **Pounds** **Gallons (varies by substance)**

LOG	>2,200	100	220	25 - 27
SQG	220 - 2,200	600	1,320	150 - 165
VSQG	<220	1,000	2,200	250 - 265
		2,000	4,400	500 - 550
		6,000	13,320	1,500 - 1,650



**HAZARDOUS
WASTE
STORAGE AREA**



Emergency Information

Emergency Phone Numbers



Emergency Coordinator _____
Day _____ Night _____

DEP Emergency Response (617) 556-1133
National Response Center: 1-800-424-8802
Fire Department _____
Police Department _____
_____ Hospital _____
Ambulance _____

Nearest Fire Extinguisher _____
Fire Alarm Location _____
Spill Control Materials _____
Two Nearest Exits _____

- If there is a chemical spill or fire, contact your Supervisor or Emergency Coordinator immediately. Wait for instructions.
- Do not use a fire extinguisher, unless you are trained.
- If instructed, evacuate the building. Know at least two ways out.
- Always wear Personal Protective Equipment for cleanup.
- If you get chemicals in your eyes, flush for at least 15 minutes. Seek medical attention.





Precious Metal Transporters

Associated Processor Service

15 Common Street
Natick, MA 01760
508-655-7750

B&D Associates, Inc.

129 Liberty Street
Central Falls, RI 02863
401-722-9845

Ecology Recovery Systems

Suite 4, 330 Tacoma Street
Worcester, MA 01605
508-852-8451

Freedman, Joseph Co. dba Solution Services

40 Albany Street
Springfield, MA 01101
413-781-4444

Karlan Service, Inc.

189 East 7th Street
Peterson, NJ 07661
201-967-9887

Merrimack Valley Medical Services Co. (BFI)

Zero Farley Street
Lawrence, MA 01843
978-687-2775

National Waste Mangement, Inc.

362 Putnam Hill Road
Sutton, MA 01590
508-476-1900

Northeast Reclaiming Services, Inc.

7 Tinkham Avenue
Derry, NH 03038
603-437-3308

Northeast Safetyloid

225 Broadway
Methuen, MA 01844
978-688-1300

PSS Imaging, Inc.

22-8 Prospect Street
Woburn, MA 01801
781-935-4470

The Quinlan Companies

125 Ernst Street
Providence, RI 02905
888-416-5353

Radiology Resources

24 Torrice Drive PO Box 2263
Woburn, MA 01888
781-935-4470

Safety-Kleen Corp.

960 Turnpike Street
Canton, MA 02021
781-828-5445

J.B. Silva Co.

61 Nichols Street
Danvers, MA 01923
508-777-2020

Solutek

94 Shirley Street
Boston, MA 02119
617-445-5335

Stericycle, Inc. (amalgam scrap, lead foil)

149 Lake Look Road
Deerfield, IL
847-274-5172

Superior Speciality Services, Inc.

218 Canton Street
Stoughton, MA 02072
781-341-6080

Instate Transporters of Hazardous Waste and Waste Oil

This is a list of licensed instate transporters authorized to provide special services to VSQGs and SQGs. For additional transporters, call DEP's Hazardous Waste Compliance Assistance Line (617-292-5898).

Metropolitan Boston and Northeast Region

Absolute Environmental, Inc.

995 Old Post Road
Walpole, MA 02081
508-660-0010

Autobody Solvent Rec. Corp.

338 Russell Street
Woburn, MA 01801
781-933-8283

Metropolitan Boston and Northeast Region (cont.)

Arlex Oil Corp.

275 Mass Avenue
Lexington, MA 02173
781-862-3400

The Aulson Co., Inc.

191 S. Main Street
Middleton, MA 01949
978-774-8887

Enpro Services, Inc.

12 Mulliken Way
Newburyport, MA 01950
978-465-1595

General Chemical Corp.

Box 608 133-138 Leland Street
Framingham, MA 01701
508-872-5000

Geochem, Inc./Jet-Line Environmental

263 Howard, Street
Lowell, MA 01852
978-344-2510

Clean Harbors Environmental Services, Inc.

1501 Washington Street
Braintree, MA 02184
781-849-1800

Craftsmen Construction Corp.

PO Box 548 124 White Street
Winchester, MA 01890
781-729-4197

Green Environmental, Inc.

216 Ricciuti Drive
Quincy, MA 02169
617-479-0550

Suffolk Services, Inc.

18 William Street
Everett, MA 02149
800-342-3515

Triumvirate Environmental

63 Inner Belt Road
Somerville, MA 02143
617-628-8098

Southeast Region

Cyn Oil Corp./Cyn Environmental Services

PO Box 119 1771 Washington Street
Stoughton, MA 02072
781-344-5108

Fleet Environmental Services, Inc.

8 Harding Street, Building 2
Lakeville, MA 02347
508-946-6900

Frank Corp.

150 Herman Melville Boulevard
New Bedford, MA 02740-7844
508-990-1009

Franklin Environmental Services, Inc.

185 Industrial Road
Wrentham, MA 02090
508-384-6151

Central Region

Evergreen Construction Co., Inc.

34 Williams Way
Bellingham, MA 02019
508-966-0330

North Country Environmental Services, Inc.

100 Medway Street, Suite 403
Milford, MA 01757
508-634-9800

Tolman Construction Service, Inc.

74 Maple Street
Baldwinville, MA 01436
508-939-5653

The Tyree Organization, Ltd.

9 Otis Street
Westborough, MA 01581-3311
508-871-8300

Western Region

MaxyMillian Technologies, Inc.

1801 East Street
Pittsfield, MA 01201
413-499-3050

Oil Recovery Corp.

138 Palmer Avenue
W. Springfield, MA 01089
413-737-2949

Southampton Sanitary Engineering Co., Inc.

168 County Road
Southampton, MA 01073
413-532-3876



Instate Transporters of Waste Oil Only

(Transporters who are permitted to provide special services to VSQGs and SQGs.)

Bonner Industries, Inc.

72 North Main Street
No. Carver, MA 02355
508-866-5230

Murphy's Waste Oil Service

252 R Salem Street
Woburn, MA 01801
781-935-9066

Out of State Transporters of Hazardous Waste and Waste Oil

(Transporters who are permitted to provide special services to VSQGs and SQGs..)

Coating Systems, Inc.

55 Crown Street
Nashua, NH 03060
603-883-0554

CWM Chemical Services, Inc.

1135 Blamer Road
Model City, NY 14107-0200
716-754-0364

Dependable Environmental Services, Inc.

48 Lowell Road PO Box 117
Windham, NH 03087
603-894-6661

Environmental Products & Services, Inc.

532 State Fair Boulevard PO Box 315
Syracuse, NY 13209
315-471-0503

Environmental Waste Resources, Inc.

PO Box 10009
Waterbury, CT 06725-0009
203-755-2283

Inland Waters Pollution Control, Inc.

2021 S. Schaefer Highway
Detroit, MI 48217
313-841-5800

Lincoln Environmental, Inc.

333 Washington Highway
Smithfield, RI 02917
401-232-3353

LRS Enviro-Services, Inc.

400 Lafayette Road, Route 1
Hampton, NH 03842
603-926-4884

C.W. Miller Co.

One Hodsell Street
Cranston, RI 02910
401-461-7330

The NDL Organization, Inc.

1000 Lower South Street
Peekskill, NY 10566
914-737-2700

Safety-Kleen Corp.

1000 N. Randall Road
Elgin, IL 60123
800-669-5840

Total Waste Management Corp.

142 River Road
Newington, NH 03801
603-431-2420

TRI-S, Inc.

25 Pinney Street
Ellington, CT 06029
860-875-2110



Silver Recovery Unit Log

Complete a separate log for **EACH silver recovery unit (SRU)**. An SRU may be comprised of one or more stages such as an electrolytic unit followed by one or more cartridges. Fill in the blanks as necessary. You may use an equivalent form. You are required to keep the log for three years.

SRU Location or other identification. _____

Total Capacity of SRU. _____ gallons per day

Average Daily Flow. _____ gallons per day

Sampling and Analysis

Electrolytic and cartridge SRUs must be sampled at least once per year. The sample must be taken within one month prior to changing the cartridges and analyzed by a state-certified laboratory.

All other systems must be sampled monthly.

Sample Date (m/d/y)	Silver Concentration mg/L (parts per million)	Sample Date (m/d/y)	Silver Concentration mg/L (parts per million)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Electrolytic SRU

Cleaning & Servicing Dates (m/d/y)	Cleaning & Servicing Dates (m/d/y)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Cartridges # of cartridges in series _____

Replacement Dates (m/d/y)	Replacement Dates (m/d/y)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



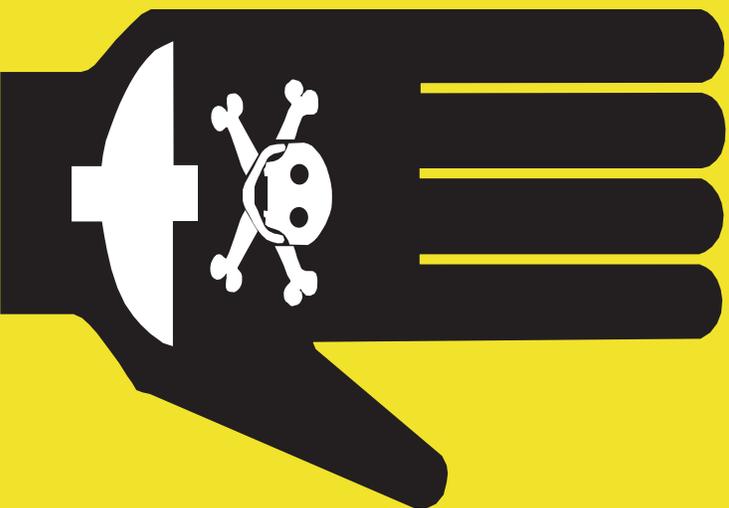
Silver-bearing Wastewater Volume Calculation Worksheet

	<i>Fixer (gals)</i>	<i>Bleach-Fix (gals)</i>	<i>Stabilizer (gals)</i>	<i>Other (gals)</i>	Monthly Total (gals)
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
	Annual Total				



ATTENTION

**DO NOT PUT
HAZARDOUS WASTES
AND WASTE INKS
DOWN THE DRAIN**

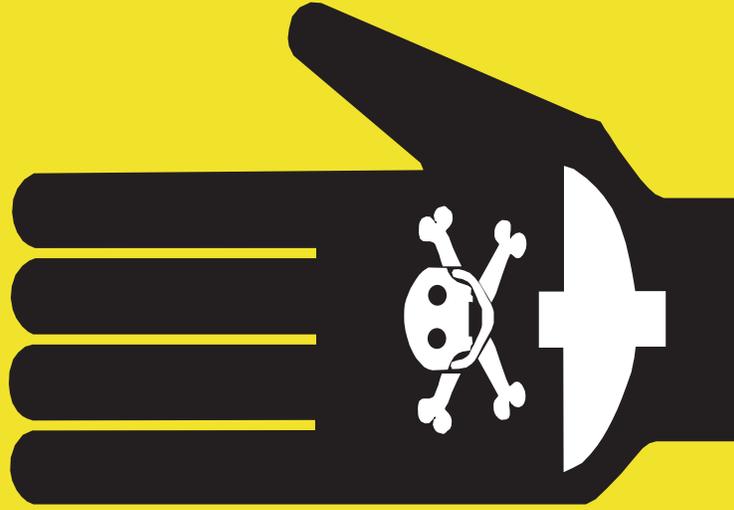


SEWER SYSTEM



ATTENTION

**DO NOT PUT
PROCESS CHEMICALS
DOWN THE DRAIN**



SEPTIC SYSTEM



List of Local Wastewater Treatment Plants

<u>City/Town</u>	<u>Contact Person</u>	<u>Tel. Number</u>
Adams	Joseph Fijal	(413) 743-8370
Amesbury	Brian LeBlanc	(978) 388-1912
Amherst	Robert Pariseau	(413) 549-5424
Athol	Mark Day	(508) 249-7600
Attleboro	Paul Nicholson	(508) 761-5167
Ayer	Robert Smith	(978) 772-8243
Barnstable/Hyannis	Peter Doyle	(508) 790-6335
Barre	Gerry Ballantine	(508) 355-6303
Belchertown	Steve Williams	(413) 323-6311
Billerica	Arthur Malcuit	(978) 671-0956
Bridgewater	Joseph Souto	(508) 697-6151
Brockton	Steven Kruger	(508) 580-7885
Buckland	John Patch	
Charlemont	Dawn Peters	
Charlton	Gary Langlouis	(508) 248-7242
Charles River PCD	Robert McRae	(508) 533-6762
Chatham	Peter Ho	(508) 945-5153
Chicopee	Laura Goff	(413) 594-3585
Clinton	Rcik Trubiano	(978) 365-6144
Cohasset	Dick Nye	(781) 383-1519
Concord	Peter Nyberg	(978) 371-7174
Dartmouth	M. David Andrade	(508) 999-0740
Dearfield	Edward Jablonski	(413) 774-4595
Dennis	Weston & Sampson	(508) 760-2990
Douglas	Marcel Tremblay	(508) 476-2400
Easthampton	David Gagnon	(413) 527-4777
Edgartown	Joe Alosso	(508) 627-5482
Erving/Miller Falls	Michael Pierce	(413) 659-3354
Erving Center	Benjamin Thompson	(413) 544-2711
Fairhaven	Linda Simmons	(508) 979-4030
Fall River	James Louzon	(508) 672-4530
Falmouth	Robert White	(508) 540-9437
Fitchburg-East	Richard H. Cooper	(978) 345-9626
Fitchburg-West	Dennis Meunier	(978) 345-9624
Gardner	Jerry Robillard	(978) 632-4137
Gloucester	Michael Thompson	(978) 281-3741
Greater Lawrence	Mark Concheri	(978) 685-1612
So. Grafton	Fred Haffy	(508) 839-8526
Great Barrington	Tim Drumm	(413) 528-0650
Greenfield	Sandra Shields	(978) 376-5424
Hadley	Dennis Pipczynski	(413) 585-0460
Gilbertville	Thmas Collett	(413) 477-6959
Hatfield	Frank Motyka	(413) 247-9844
Haverhill	John Connor	(978) 374-2382
Holyoke	Thomas Ordway	(413) 534-2222
Hoosac/Williamstown	Carl Dickinson	(413) 548-5016
Hopedale	Donna Ares	(508) 634-2210
Hudson	Robert Eddy	(978) 562-9333
Hull		(781) 925-0906
Huntington	Brian Sheedy	(413) 667-3356
Ipswich	Tim Henry	(978) 356-5532
Lee	Ken Labier	(413) 243-5525
Leicester	Frank Lyon	(508) 356-5532
Lenox	Philip Bailey	(413) 637-1973
Leominster	Robert Chalifoux	(978) 537-5720
Lowell	Mark Young	(978) 970-4248
Lynn	James Taylor	(781) 592-7048
Manchester	Jim Sibbalds	(978) 526-4612
Mansfield	William Handy	(508) 285-5746
Marion	Richard Guerzoni	(508) 748-3540

**List of Local Wastewater Treatment Plants (cont.)**

<u>City/Town</u>	<u>Treatment Facility</u>	<u>Tel. Number</u>
Marlborough-East	Dan McNamara	(508) 485-1755
Marlborough-West	Harry Butland	(508) 481-1208
Marshfield	Kevin Silva	(781) 834-5021
Maynard	Charles Helen, Sr.	(978) 897-1020
Medfield	Peter Oaffoia	(508) 359-4533
Merrimac	Charles Nevin	(978) 346-9988
Middleborough	Joseph Ciaglo	(508) 946-2485
Milford	John Mainini	(508) 473-2054
Millbury	Bradford Lange	(508) 865-3780
Monroe	Ronald Rutstein	(413) 424-7723
Montague	Robert Trombley	(413) 773-8865
MWRA		(617) 241-2333
Natucket	Rick Eldridge	(508) 325-5333
New Bedford	James Gelipeau	(508) 991-6165
Newburyport	Joseph Dugan	(978) 465-4422
No. Attleboro	John Horton	(508) 695-7872
North Brookfield	Rodney Jenkins	(508) 867-0211
Northhampton	James Dostal	(413) 586-6950
Northbridge	James Madigan	(508) 234-2154
Northfield	Lionel Gagnon	(413) 498-5116
Orange	Larry Adams	(978) 544-1114
Orleans	James Burgess	(508) 255-1150
Oxford/Rochdale	Robert Wilson	(508) 892-9549
Palmer/Three Rivers	Gary Kuczarski	(413) 283-2671
Pepperell	Henry Albro	(978) 433-9859
Pittsfield	Tom Landry	(413) 499-9304
Plymouth	Gary Frizzell	(508) 830-4159
Rockland	Aram Varjabedian	(781) 878-1863
Rockport	Robert Cashman	(978) 546-7888
South Royalston	John Drouin	(978) 249-3318
Russell	Peter McLaughlin	(413) 862-3101
Salisbury	Jeff Ingalls	(978) 465-4058
Salem/South Essex SD	Harold Newhall	(978) 744-4550
Scituate	Bob Rowland	(781) 545-8736
Somerset	Harold Grazia	(508) 646-2838
South Hadley	Rudolf Urgiel	(413) 538-5040
Southbridge	Paul Dransnecky	(508) 764-4927
Spencer	Mark Robidoux	(508) 885-7542
Springfield	George A. Romano	(413) 787-6256
Stockbridge	David Sparks	(413) 298-4067
Sturbridge	Racy Earnest	(508) 347-2514
Sunderland	Robert Gabry	(413) 665-1447
Swampscott	Patrick Brennan	(781) 592-5393
Taunton	Dan Walsh	(508) 823-3582
Templeton	Mark Kajka	(978) 939-5171
Upper Blackstone SD	Arthur Levesque	(508) 755-1286
West Upton	Leo Morin	(508) 529-3993
Uxbridge	William Burma	(508) 278-2887
Ware	Robert Racowka	(413) 967-9624
Wareham	James Shaw	(508) 295-6144
Warren	Shaun Romanski	(413) 436-5796
Webster	Philip Robert	(508) 949-3865
West Stockbridge	Keith Clark	(413) 232-0309
Westborough	Chris Pratt	(508) 366-1870
Westfield	Alan Pierce	(413) 572-6313
Winchendon	Edmond Fitzgibbons	(978) 297-0536
Yarmouth	John MacArthur	(508) 760-2990



VOC and HAP Data Sheet

Properties of the Products as Supplied by the Manufacturer

Property Manufacturer _____

Property Identification _____

Product density _____ lb/gal. ASTM D1475-60 VOC content _____ lb/gal.
 Total volatiles _____ Weight % ASTM Flash Point _____ ASTM D93
 Water content _____ Weight % ASTM D 4017 HAP Content _____ Method 311
 Organic volatiles _____ Weight %

Hazardous Air Pollutants:

Name	Weight %
_____	_____
_____	_____
_____	_____
_____	_____

Remarks:

Fountain Solution VOC Addition Form

Indicate When Any VOC is Added To Press Ready Fountain Solution

Press	VOC in Concentrate (ounces)	VOC in Additive (ounces)	VOC Added (ounces)	Final VOC Content in Weight Percent

Final Press Ready VOC Concentration:

Step 1 Weight of VOC in Concentrate = $\frac{\text{Oz. Concen.} \times \text{VOC Content (lbs/gal)}}{128 \text{ oz/gal}}$

Step 2 Weight of VOC in Additive = $\frac{\text{Oz. Additive} \times \text{VOC Content (lbs/gal)}}{128 \text{ oz/gal}}$

Step 3 Weight of VOC Added = $\frac{\text{Oz. Added VOC} \times \text{VOC Content (lbs/gal)}}{128 \text{ oz/gal}}$

Weight Percent VOC = $\frac{\text{Result of Steps 1+2+3}}{\text{Result of 1+2+3} + 8.33 \text{ lbs/gal water}}$



How to Calculate Your VOCs and HAPs

If you are a large printer and purchased and/or used more than 3,000 gallons of press or screen cleaning solvents during the past 12 months.

Conversion chart of pounds/gallons/tons

1 gallon	= 6-8 pounds (depends on product's specific gravity)
275 gallons	= 5 drums x 55 gallons (about 1 ton)
3,000 gallons	= ~10 tons (depending on specific gravity)
2,000 pounds	= 1 ton

STEP 1: Gather your Material Safety Data Sheets (MSDS) for:

- Blanket wash/roller wash/press wash/type wash
- Parts cleaner (solvent)
- Inks, coatings and adhesives
- Alcohol or alcohol substitutes (including fountain solution concentrate)
- Proofing system solutions (if alcohol or solvent based)
- Any other VOC-containing formulations you use (in excess of 55 gal. of incidental materials)

STEP 2: Complete the following for each product: (Sec. 2 or 3 of the MSDS for VOC content)

- Product name _____ Mfr/vendor _____
- Monthly Use _____ gallons (gals) or pounds (lbs)
- VOC Content _____

If VOC content of product is given in weight % VOC, then:

[total VOC % divided by 100] x lbs per month of product = lbs of total VOCs per month.

If VOC content is given in lbs VOC per gal of product, convert as follows and use result in the above formulas:

For calculating VOC in inks:

[lbs total VOC per gal of product] divided by [lbs per gal of product (density of product)] = lbs total VOC per lb of product = [total weight % divided by 100].

For press cleaning materials (sold by the gallon):

[lbs total VOC per gal of product] x gals per month of product = lbs. total VOCs/mo.

If VOC content is given in volume % VOC, contact your supplier or manufacturer to obtain weight % VOC.

STEP 3: Calculate Your Annual VOC Emissions:

Add up the monthly use of each product in lbs VOC/month.

[If you do not have actual product use records for the last 12 months, then take the monthly use of each product in lbs VOC/month and multiply by 12.]

Add the annual VOC emissions of each product and divide by 2,000 to obtain tons VOC/year.

Fountain Solution Batch VOC Content Form

Fountain Solution Concentrate

Product _____ Density (lbs/gal)*: _____
 Formula Number: _____ VOC Content (lbs/gal**): _____

Fountain Solution Additive

Product _____ Density (lbs/gal)*: _____
 Formula Number: _____ VOC Content (lbs/gal**): _____

Density can either be found on the Materials Safety Data Sheet or determined by multiplying the specific gravity from the MSDS by 8.33 pounds per gallon.

VOC content can either be found on the Material Safety Data Sheet, conducting EPA Method 24, or determined by summing the percent composition of each individual VOC and multiplying it by the density. Do not include exempt VOCs, especially Methylene Chloride and 1,1,1-Trichloroethane.

** Note: lbs/gal = (% volume of VOC x solvent density) - wt. of water

- Ounces of Fountain Concentrate Added Per Gallon of Water.
- Ounces of Fountain Additive Added Per Gallon of Water.

Press Ready VOC Concentration:

Step 1 Weight of VOC in Concentrate = $\frac{\text{Oz. Concen} \times \text{VOC Content (lbs/gal)}}{128 \text{ oz/gal}}$

Step 2 Weight of VOC in Additive = $\frac{\text{Oz. Additive} \times \text{VOC Content (lbs/gal)}}{128 \text{ oz/gal}}$

$$\text{Weight Percent VOC} = \frac{\text{Step 1} + \text{Step 2}}{\text{Step 1} + \text{Step 2} + 8.33}$$

VOC Composite Partial Pressure is calculated as follows:

$$PP_c = \sum_{i=1}^n \frac{(W_i)(VP_i)/(MW_i)}{W_w/Mw_w + W_e/Mw_e + \sum_{i=1}^n W_i/MW_i}$$

Where:

- W_i = Weight of the "i" th VOC compound in grams
- W_w = Weight of water in grams
- W_e = Weight of exempt compounds in grams
- Mw_i = Molecular weight of the "i" th VOC compound, in $\frac{g}{\text{mole}}$
- Mw_w = Molecular weight of water, in $\frac{g}{\text{mole}}$
- Mw_e = Molecular weight of exempt compound, in $\frac{g}{\text{mole}}$
- PP_c = VOC composite partial pressure in mm Hg
- VP_i = Vapor pressure of the "i" th compound, in mm Hg
- n = The number of VOC compounds



Self-Converting Permit Worksheet

This worksheet provides an example on how to complete Questions 38 and 40 of the Self-Certification Form. These questions relate to existing air quality permits for printing operations in your shop.

The example assumes that you have two existing air quality permits. You intend to self-convert one permit and comply with the applicable ERP standards. The other permit, you intend to keep and comply with the permit conditions.

Question 37

Are you self-converting any of those permits?
(see page 35, scenario 1 and 2 in workbook section 5.0)

Yes – Indicate the number of presses covered by each permit by completing the sections below. Complete one section for each permit.

No – Skip to Question 39

38. Application # MBR-96-IND-056

(This # is in the top right hand corner of your DEP Approval)

Write the # of presses covered by the permit in the box corresponding to each type of press. If no presses of a particular type are covered by the permit, write "0". See sample question #38, which is included in this packet, for an example.				
Lithography	Screen	Gravure	Letterpress	Flexographic
1	0	0	0	0

Question 39

Do you hold any DEP air quality permits that you are not self-converting? (see pages 23 and 24, workbook sections 3.3.5 and 3.3.6; see also page 36, scenario 3, workbook section 5.0)

Yes – Complete the chart(s) below

No – Skip to Question 42

40. Application # MP96022

(This # is in the top right hand corner of your DEP Approval)

Write the # of presses covered by the permit in the box corresponding to each type of press. If no presses of a particular type are covered by the permit, write "0". See sample question #40, which is included in this packet, for an example.				
Lithography	Screen	Gravure	Letterpress	Flexographic
0	1	0	0	0

Guidance on Whether a Nonconforming or Heatset Press Needs a Permit

Section 1.0 How to Calculate Your Total Actual Facility Emissions

STEP 1: Gather all records on purchase and/or use of VOC containing materials, as well as source registration submittals from past years.

STEP 2: For unpermitted presses, calculate the emissions for the previous 12 months using the worksheet on page 53. If the press has operated less than 12 months, and therefore you do not have 12 months of emission information for that press, you can estimate the emissions using the following methods in descending order of reliability.

1. If you have an existing press of the same type and size as the new press, estimate the emissions for the new press based on the design capacity of the existing press.
2. If you have one or more months of purchase and/or use records for the new press, project the 12 months of emissions. See “How to Calculate Your VOCs and HAPs” on page 53.
3. If you have neither of the above, contact the manufacturer and estimate based on design capacity, expected capacity utilization, and material usage for the next 12 months.

STEP 3: For permitted presses, determine actual VOC emissions based on the purchase and/or use of any VOC-containing materials for the previous 12 months. If you have permitted control equipment, you can also include reduction efficiency (capture and control) in calculating your actual VOC emissions.

STEP 4: Add the emissions from step 3 and 4 and determine your total actual emissions. See example below.

Source	Raw Materials	%Reduction Efficiency	Total Annual VOCs
Unpermitted Press	5.0	N/A	5.0
Permitted Press	12.0	90	1.2
Total Actual Facility Emissions			6.2

Values in tons VOC/year, unless otherwise noted.

Section 2.0 How To Determine Whether An Existing Unpermitted Press Needs A Permit

If you have no records on purchase/use of VOCs for that press, then you are required to get a permit.

If you have purchase and/or use records, and your total actual facility emissions are ≤ 10 ton VOC/year, then a permit is not needed. Comply with the ERP standards, Table 3 (page 24) and the recordkeeping requirements on pages 27-28.



If you have purchase and/or use records, and the total actual facility emissions are > 10 tons VOC/year, then you must get a permit for the press that trips the 10 ton facility-wide threshold.

If you have purchase and/or use records, your total actual facility emissions are > 10 tons VOC/year, and you have two or more unpermitted presses that were installed at different times, you may not need a permit for the older presses. A permit for the older press(es) is not required, if you have records to demonstrate that your total actual facility emissions were \leq 10 tons VOC/year (including emissions from the older unpermitted presses). The older press must comply with the ERP standards for facilities with \leq 10 tons VOC/year of total actual facility emissions. See Table 3 on page 24.

Section 3.0 How To Determine Whether An Existing Permitted Press Still Needs A Permit

Refer to Section 5.0. Permit Scenario 2 (page 35) provides guidance on existing presses with permits.

Section 4.0 How To Determine Whether A New Press Needs A Permit

Calculate your total actual facility emissions, including estimated emissions from the new press, using the steps in Section 1.0 above.

If your total actual facility emissions are \leq 10 tons VOC/year, then a permit is not required for the new press.

If your total actual facility emissions are > 10 tons VOC/year, then a permit is required for the new press.



(Typical HAPs used by printers are highlighted in bold.)

CAS No.	Chemical	CAS No.	Chemical
75070	Acetaldehyde	111444	Dichloroethyl ether
60355	Acetamide	542758	1,3-Dichloropropene
75058	Acetonitrile	62737	Dichlorvos
98862	Acetophenone	111422	Diethanolamine
53963	Acetylaminofluorene	121697	N,N Dimethylaniline
107028	Acrolein	64675	Diethyl sulfate
79061	Acrylamide	119904	3,3'-Dimethoxybenzidine
79107	Acrylic acid	60117	Dimethylaminoazobenzene
107131	Acrylonitrile	119937	3,3'-Dimethyl benzidine
107051	Allyl chloride (3-chloropropene)	79447	Dimethyl carbamoyl chloride
92671	4-Aminobiphenyl	68122	N,N-Dimethylformamide
62533	Aniline	57147	1,1-Dimethylhydrazine
90040	o-Anisidine	131113	Dimethyl phthalate
1332214	Asbestos	77781	Dimethyl sulfate
71432	Benzene	534521	4,6-Dinitro-o-cresol and salts
92875	Benzidine	51285	2,4-Dinitrophenol
98077	Benzotrichloride	121142	2,4-Dinitrotoluene
100447	Benzyl chloride	123911	1,4-Dioxane
92524	Biphenyl	122667	1,2-Diphenylhydrazine
117817	Bis(2-ethylhexyl) phthalate (DEHP)	106898	Epichlorohydrin
542881	Bis(chloromethyl)ether	106887	1,2-Epoxybutane
75252	Bromoform	140885	Ethyl acrylate
106990	1,3-Butadiene	100414	Ethylbenzene
156627	Calcium cyanamide	51796	Ethyl carbamate (urethane)
133062	Captan	75003	Ethyl chloride
63252	Carbayl	106934	Ethylene dibromide
75150	Carbon disulfide	107062	Ethylene dichloride (1,2-dichloroethane)
56235	Carbon tetrachloride	107211	Ethylene glycol
463581	Carbonyl sulfide	151564	Ethylene imine (aziridine)
120809	Catechol	75218	Ethylene oxide
133904	Chloramben	96457	Ethylenethiourea
57749	Chlordane	75343	Ethylidene dichloride (1,1-dichloroethane)
7782505	Chlorine	50000	Formaldehyde
79118	Chloroacetic acid	76448	Heptachlor
532274	2-Chloroacetophenone	118741	Hexachlorobenzene
108907	Chlorobenzene	87683	Hexachlorobutadiene
510156	Chlorobenzilate	77474	Hexachlorocyclopentadiene
67663	Chloroform	67721	Hexachloroethane
107302	Chloromethyl methyl ether	822060	Hexamethylene-1,6-diisocyanate
126998	Chloroprene	680319	Hexamethylphosphoramide
1319773	Cresols	110543	n-Hexane
95487	o-Cresol	302012	Hydrazine
108394	m-Cresol	7647010	Hydrochloric acid
106445	p-Cresol	7664393	Hydrofluoric acid
98828	Cumene	123319	Hydroquinone
94757	2,4-D, salts and esters	78591	Isophorone
3547044	DDE	58899	Lindane
334883	Diazomethane	108316	Maleic anhydride
132649	Dibenzofurans	67561	Methanol
96128	1,2-Dibromo-3-chloropropane (DBCP)	72435	Methoxychlor
84742	Di-n-butyl phthalate	74839	Methyl bromide (bromomethane)
106467	1,4-Dichlorobenzene (p)	74873	Methyl chloride (chloromethane)
91941	3,3'-Dichlorobenzidine	71556	Methyl chloroform (1,1,1-trichloroethane)



Here are four examples of cost/benefit methods to help determine the cost of compliance or a particular P2 technique. These methods, as well as others, can be tailored to your needs and can be applied to other situations.

Method 1 - Cost/Benefit of Silver Recovery Systems

Cost to purchase and install silver recovery equipment: \$ _____
 Annual cost to service and maintain equipment: \$ _____
 Monthly volume of fixer: _____ x 12 = annual volume: _____ gallons
 Cost of fixer per gallon: \$ _____
 Value of recovered silver: \$ _____ (estimate on basis of removal efficiency x annual volume of fix used x average price paid for silver)
 Total annual cost: \$ _____
 Annual cost of fix + 1/5 of equipment cost (amortized over 5 yrs.) + annual maintenance cost - annual value of recovered silver: \$ _____

Method 2 - Photochemical Waste Removal/Recycling (for any hazardous waste)

Monthly volume of fixer: _____ x 12 = annual volume: _____ gallons
 Cost per gallon of fixer: \$ _____
 Cost per gallon to ship as hazardous waste or recyclable material: \$ _____
 Total annual cost (total material cost + annual disposal cost): \$ _____

Method 4 - Chemical Substitution Evaluation Method

Current product: _____
 Annual gallons and cost: _____ gallons \$ _____
 VOC content: _____ lbs/gal
 Annual gallons X VOC content = _____ lbs VOC/year
 Product vapor pressure in mm (Hg): _____

Substitute product: _____
 Annual gallons and cost: _____ gallons \$ _____
 VOC content: _____ lbs/gal
 Annual gallons X VOC content = _____ lbs VOC/year
 Product vapor pressure in mm (Hg): _____

Questions:

How well does the substitute work? _____
 Is it easier to use? _____
 Does it require a change in work practices? _____
 Does it require retraining of employees? _____
 Is there an annual cost savings? Yes ___ No ___ If so, how much? \$ _____
 Is the vapor pressure below 10 mm Hg (for press cleaning solvents only)? Yes ___ No ___
 Is there a reduction in VOCs? Yes ___ No ___ If so, what is it? _____ lbs/year

Recommendation:

Should we use the substitute product? Yes ___ No ___



Method 3 - Simple Payback Analysis for Fixer Recirculation System
(can be used for other equipment)

Monthly volume of fixer: _____ x 12 = annual volume: _____ gallons
Cost per gallon of fixer: \$ _____
Cost per gallon to ship as hazardous waste or recyclable material: \$ _____
Total annual waste disposal cost (annual volume x cost per gallon): \$ _____
Volume and cost of water for the last two years
199__ : \$ _____ 199__ : \$ _____
Average annual volume and cost of water: _____ gallons \$ _____
Estimated annual savings in water use with recirculation system: _____ gallons \$ _____
Estimated annual savings in fixer purchases: _____ gallons \$ _____
Cost of recirculating system installed: \$ _____ System annual service and maintenance cost: \$ _____
Number of years before savings achieved: _____

Cost of recirculating system \$ _____

(annual disposal \$ _____ + saved fixer \$ _____ + saved water \$ _____ - maintenance \$ _____)

Go to page 62 for agencies, associations, and services available to the printer, including technical assistance and pollution prevention resources.



DEP Infoline (Printer Information)(617) 338-2255

or 1-800-462-0444

Permit Section

DEP Regional Offices:

Northeast	205A Lowell Street, Wilmington	(978) 661-7677
Southeast	20 Riverside Dr., Lakeville	(508) 946-2779
Central	627 Main St., Worcester	(508) 792-7692
Western	436 Dwight St., Springfield	(413) 784-1100 x 277

DEP Emergency Response

Boston Area (617) 556-1133

Elsewhere 1-888-304-1133

DEP Hazardous Waste Compliance Assistance Line

(617) 292-5898

US Environmental Protection Agency (EPA)

New England Environmental Assistance Team

(800) 906-3328

National Common Sense Initiative

(202) 564-7072

Massachusetts Division of Energy Resources: Energy Advisor Service

(617) 727-4732

The service will help printers calculate the energy cost implications of their actions and develop short and long term plans for energy efficiency. Clients pay approximately 12% of the overall cost of EAS services.

Massachusetts Office of Technical Assistance for Toxics Use Reduction (OTA)

(free confidential onsite visits by appointment)

(617) 727-3260

OSHA Consultation Service (Mass. Division of Labor & Industries)

(617) 969-7177

Massachusetts Water Resources Authority (MWRA) Sewerage Division

(617) 242-7310

CHEMTREC (Chemical Manufacturers Association)

1-800-262-8200

“WasteCap Of Massachusetts”

(617) 236-7715

A not-for-profit service organization which helps businesses find ways to recycle their solid waste.

“Working Capital”

(617) 576-8620

A nonprofit program for micro-businesses and communities providing group-based support, loans and technical assistance to self-employed persons with limited resources.

Printing Industries of New England (PINE)

(508) 655-8700

Screen Printing & Graphic Imaging Association (SIGA)

(703) 359-1313

Printing Industries of America/Graphic Arts Technical Foundation (PIA/GATF)

(412) 741-6860

Flexographic Technical Association

(516) 737-6020



Mixmaster software program for mixing and recycling ink 1-800-332-9321
Software allows user to input the ink stock, type in a desired color name and quantity
and use up excess ink inventory. Three versions available.

P₂ Print (Northeast Waste Management Officials' Association) (617) 367-8558 x 304

Other documents which may help you:

Pollution Prevention Manual for Lithographic Printers, published by Iowa Waste
Reduction Center, University of Northern Iowa (319) 273-2079

A Guide for Photo Processors, A Guide for Lithographic Printers, A Guide for Screen
Printers, published by Washington State Department of Ecology (206) 649-7000

Financing Pollution Prevention Investments: A Guide for Small and Medium-Sized
Business, published by NE USEPA and Northeast Waste Management Officials'
Association (NEWMOA) (617) 367-8558

Interactive CD-ROM on Technical Assistance with Pollution Prevention in the Printing In-
dustry (available fall 1998), published by Northeast Waste Management Officials'
Association (NEWMOA) 617) 367-8558

Fit to Print, An Environmental Compliance and Pollution Prevention Manual for New Eng-
land Lithographers, published by EPA's New England Environmental Assistance
Team (NEEATeam) 1-800-90-NEEAT (1-800-906-3328)