United States Environmental Protection Agency, Region 1 New England Environmental Assistance Team EPA-901-B-97-001 May 1997



Fit

An Environmental Compliance and Pollution Prevention Manual for New England Lithographers



Here is what some printers, trade associations, and regulators have said about *Fit to Print*:

"'Fit to Print' is great -- an excellent source of vital information. It answered a few questions that I could **never** get an answer for."

Jane Cioffi, Southington Printing Co.

"You have done a very nice job of reducing a complex, and for many of us, an incomprehensible set of different regulations into a readable and understandable document. It is packed with useful information." Michael D. Coughlin, Concord Litho Company, Inc.

"The manual is terrific and should go far in helping printers understand and comply with the EPA regulations."

Anthony Racco, The Hartford

"This document is a fine effort at tackling a very difficult topic, and should serve as a valuable resource and reference document for printers who are committed to environmental compliance." Stig Bolgen, Printing Industries of New England

"[We were] very impressed with the thoroughness and quality of the manual. We are certain that it will be a big help to lithographic printers in the region."

Richard T. Enander, Rhode Island Department of Environmental Management

"I thought the document was well done. It is well organized ... and this format will help printers understand how environmental regulations specifically apply to what they do."

Paul Van Hollebeke, Vermont Agency of Natural Resources



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 1 JOHN F. KENNEDY FEDERAL BUILDING BOSTON, MASSACHUSETTS 02203-0001

April 17, 1997

OFFICE OF THE REGIONAL ADMINISTRATOR

I am very pleased to give you *Fit to Print*: An Environmental Compliance and Pollution Prevention <u>Manual for New England Lithographers</u>, produced by EPA's New England Environmental Assistance Team (NEEATeam). By using a variety of tools to promote industrial environmental protection -- education, outreach, and assistance among them -- the NEEATeam has provided compliance and pollution prevention assistance to small and medium-sized companies in New England since 1995. Through their efforts, the NEEATeam has shown that sound environmental practices make good business sense.

Through its *Fit to Print* initiative, the NEEATeam -- along with its state and industry partners -- has been busy generating helpful materials and sponsoring events for printers throughout New England. Besides this manual, the NEEATeam's *Fit to Print* initiative is developing compliance and pollution prevention workshops, technology demonstration open houses, fact sheets, customer education projects to encourage "green" printing, and an evaluation of a new printing ink system. In using these materials and events, we hope to help printers meet their regulatory obligations, practice pollution prevention and thrive economically.

We hope this document helps you become "fit to print." Because this manual is the first of its kind generated by the NEEATeam, we especially welcome your comments and suggestions. Please call the NEEATeam at (800) 906-3328 with any comments, suggestions or questions.

Sincerely,

John P. DeVillars Region I Administrator

ACKNOWLEDGMENTS

The authors would like to thank the following individuals for their contributions to the development of this manual:

CT Department of Environmental Protection: David Cherico, Glen Daraskevich, John Gove, Jim Grier, Bob Hannon, Mike Harder, Robert Isner, Dick Mason, Joe Pulaski, Mary Sherwin, David Westcott; ME Department of Environmental Protection: Mike Hudson, Brian Kavanah, Jim Rogers, Chris Rushton, Ann Pistell: MA Department of Environmental Protection: John Reinhardt, Gene Romero. William Sirull, Nancy Wrenn; MA Office of Technical Assistance for Toxic Use Reduction: George Frantz: NH Department of Environmental Services: Jeffrey Andrews, George Carlson, Rudy Cartier, Max Hilgemeier, Tod Leedberg, Mitchell Locker, Vince Perelli, Craig Wright; RI Department of Environmental Management: Joe Antonio, Richard Enander, Tom Epstein, Richard Girasole, Ted Hickey, Angelo Liberti, Doug McVay, Beverly Migliore, Terry Simpson, Gregory Yekhtikian; VT Agency of Natural Resources: Val Colgrove, Gary Gulka, Chris Jones, Sherrie Kasten, Brian Kooiker, Christine Thompson, Paul Van Hollebeke; Northeast Waste Management Officials' Association: Lisa Regenstein; Printing Industries of New England: Stig Bolen; Goldman Environmental Consultants: Robert Fricke; Cambridge Environmental, Inc.: Robert Pojasek; Book Press, Inc.: Paul Norcross; Concord Litho Company, Inc.: Michael Coughlin; The Hartford: Anthony Racco; Southington Printing Company: Jane Cioffi: Graphic Arts Technical Foundation: Gary Jones: U.S. Environmental Protection Agency, Washington, D.C.: Doug Jamieson, David Salmon,

We would also like to recognize the following individuals from the **U.S. Environmental Protection Agency, Region I, New England** who provided valuable suggestions on improving this document: Andrea Simpson, Lee MacMichael, Leonard Wallace, Ann Williams, and Tim Williamson. Also, we would like to say a special thanks to: Anne Arnold, Dave Delaney, Joan Jouzaitis, Anne Leiby, Sally Mansur, Lisa Papetti, and Mark Spinale, without whose expertise and commitment this manual would not have been possible.

This manual discusses the most significant federal and state environmental regulations that apply to the lithographic printing industry. This manual is not an official EPA or state guidance document and should not be relied upon by the industry as a method to identify all applicable regulatory requirements for the following reasons: 1) Laws and regulations change; 2) Regulations that apply to a facility depend upon the particular processes and chemicals used -- this manual contains information that applies in general conditions; and 3) Laws and regulations at the federal, state, and local levels may differ -- please note that local requirements are not identified in the manual. This manual does not create any rights enforceable in litigation with the United States or the states.

We encourage you to use this manual as part of a larger compliance effort. Take time to identify the universe of rules that apply to your facility by examining the regulations and requirements themselves. Also, use the wide range of resources that are available to assist you -- see Chapter 9 for a list of federal and state assistance providers who may be able to offer you additional information.

In printing this manual, the New England Environmental Assistance Team followed the recommendations made in this manual where possible, under the constraints made by U.S. contracting and procurement regulations. The following specifications were used:

Paper: 100% recycled 30% post-consumer minimum 70% lb. basis weight no bleaching no coating Cover: 100% recycled 30% post-consumer minimum 80% lb. basis weight no bleaching no coating

Ink: vegetable-based

This manual will soon be available in electronic form through a number of sources.

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- Wastewater Discharge Hazardous Waste Management •
- Air Emissions Control •

I. HOW CAN I BECOME "FIT TO PRINT?"

As we move toward the 21st Century, printing shops are facing increasing pressure to understand the environmental consequences of their operations. As a New England lithographic printer, you should care about operating your shop in an environmentally sound manner for several reasons:

- Your shop's use of solvents, inks, fixers, coatings, and other chemicals can impact the environment and your workers.
- The costs of noncompliance can be high.
- Alternatives to your current way of doing business may exist that could save you money.

This manual is designed to help you understand these issues and to give you the tools to make appropriate changes in your processes, where necessary. This manual is divided into chapters that tell you how to comply with the most significant federal environmental regulations. The pocket at the end of this manual contains summaries of state-specific environmental regulations. You will also find information on pollution prevention, solid waste management, emergency planning and response, and resources throughout New England that are available to assist you. We hope that you find this manual useful and that it helps you become "Fit To Print."

I.I HOW DO I COMPLY WITH THE LAWS AND REGULATIONS THAT APPLY TO MY LITHOGRAPHIC PRINT SHOP?

It is important for you to be aware of and comply with **all** environmental laws and regulations that apply to your print shop. These laws and regulations can be found at the federal, state, and local levels. Congress has enacted the federal environmental laws over the past three decades to protect our air, land, and water. The U.S. Environmental Protection Agency is directed to write regulations that implement these laws. In most instances, the states have also developed regulations that are often, but not always, based on federal regulations. By law, state environmental regulations must be at least as stringent as their federal counterparts; in some cases, they are **more** stringent than federal regulations. For this reason, you should be especially careful to determine how your state's environmental regulations apply to your print shop. You should become familiar with your state environmental agency and its regulations, and use this document to guide your inquires.

This manual discusses the most significant -but not all of the -- federal and state environmental requirements that apply to your print shop; local requirements are not addressed at all. City or town water and sewer departments, especially, will most likely have standards of which you should be aware. You should contact these offices directly to get the best information on their requirements.

Here is what you should do:

• First, identify the materials you use and the wastes you generate at your print shop. The information contained in Chapter 3 will help you identify the types of wastes you generate in your prepress, press, and postpress operations and your housekeeping activities. Lithographic printing wastes can include wastes released into the water including treated fixer and developer; hazardous waste, such as untreated fixer; and releases into the air from solvents and coatings.

• Second, determine which laws and regulations apply to your print shop in light of the materials used and wastes generated at your print shop. Chapters 4 through 6 highlight the most significant federal regulatory requirements that may apply to your print shop. The pocket at the back of this manual includes summaries of the major state environmental requirements that may impact your print shop. These summaries are not intended to replace state regulations, however.

• Finally, determine what other laws and regulations apply to your processes, in

addition to those that govern how you deal with the wastes you produce. Chapter 8 sets forth many of the additional spill reporting and other reporting requirements to which your print shop may be subject.

1.2 WHAT POLLUTION PREVENTION TECHNIQUES CAN I USE AT MY LITHOGRAPHIC PRINT SHOP?

This manual highlights pollution prevention (P2) techniques that may improve your shop's compliance and environmental performance. Why should you try pollution prevention? A U.S. Chamber of Commerce survey of 800 companies showed that labor and environmental regulations are business "growth killers" (i.e., they caused businesses to raise prices and reduced their profitability). So the best way to improve the viability of your shop is to decrease your regulatory burden. And the only legal way to do that is to prevent pollution. Chapter 2 explains pollution prevention in detail and summarizes some of the P2 options that can be used in your industry. Chapters 4 through 6 provide examples of P2 techniques. Solid waste reduction techniques and resources are provided in Chapter 7.

I.3 WHERE CAN I GET ADDITIONAL INFORMATION?

The names and telephone numbers of federal and state contacts are provided throughout this manual. If you have a question about your compliance obligations or about P2 opportunities, we encourage you to call the contacts listed at the end of Chapter 9 and provided in the pocket at the end of this manual, as well as your local city or town agents.

Who are "we?" Regional experts in conjunction with the New England Environmental Assistance Team (the NEEATeam) produced this manual. The NEEATeam provides environmental compliance and pollution prevention information for selected regulated groups, including printers, throughout New England. We can help you find experts in federal and state governments, commercial organizations, and non-profit groups; we can provide written reference materials and advise you on environmental compliance and pollution prevention strategies; and we can give you the recognition you deserve for practicing pollution prevention. So, call us at 1-800-90NEEAT. Look for our homepage on the Internet at http://www.epa.gov/region01. Or, write to us at the address listed in Chapter 9.

A closing thought: You can do it! If you can master the fine art of printing, you can comply with environmental regulations and prevent pollution as many others in your industry have done.

2. How CAN POLLUTION PREVENTION MAKE ME "FIT TO PRINT?"

Pollution prevention is a simple idea: it means you eliminate pollution **before it is created** by your manufacturing processes rather than controlling the pollution from your processes and then treating and disposing of the wastes that you generate. Pollution prevention techniques that printers can use range from merely using chemicals in the shop more conservatively and responsibly to making fundamental changes in the way presses are operated and maintained. This chapter discusses the benefits of pollution prevention, as well as some of the techniques that might work in your shop.

2.1 WHAT IS POLLUTION PREVENTION AND HOW CAN IT HELP MY PRINT SHOP?

The U.S. Environmental Protection Agency defines pollution prevention as the use of materials, processes, or practices that reduce or eliminate the generation of pollutants or waste at the source. The direct benefits of pollution prevention are:

- Decreased waste management costs
- Decreased input materials costs and energy consumption
- · Decreased environmental compliance costs
- · Decreased liability
- Increased compliance
- · Increased worker safety
- · Improved corporate image.

What will these benefits mean to your printing business?

Reductions in the cost of operating your print shop.

The creation of waste that impacts the water, land, or air, and the use of certain chemicals, translates into additional dollars you must spend. When you generate waste, your operating costs increase since you must pay for items, such as hazardous waste disposal, the installation and operation of pollution control equipment, and permit fees. By reducing waste streams, you can cut the cost of operating your shop. And these cost savings should translate to **lower prices** and **increased profits**.

For example, you purchase a petroleum-based solvent for press cleaning, you clean your presses with the solvent, and the remainder that collects in drip trays becomes a hazardous waste (because it has been mixed with inks and other contaminants). Then, you pay someone to dispose of the solvent in a responsible manner. Essentially, you have paid for the solvent twice -- once when you bought it the first time and again when it went out for disposal as a hazardous waste. You would not throw out part of a completed job, so why waste the materials that go into the job by using them carelessly? Using your press wash conservatively is an example of pollution prevention that can prevent waste and reduce your operating costs.

A more efficient and more productive business.

In order to maintain compliance with environmental regulations, you and your staff must conduct a great number of activities. Each of these compliance activities costs your shop time and money. And, more often than not, the cost is hidden in your shop's overhead. The more waste you generate, the more your shop may be regulated. So, if you spend less time on compliance because you have less waste to manage, you will have more time to do what you are supposed to do: PRINTING.

Peace of mind.

If your workers are exposed less frequently to hazardous materials, their health and safety will not be as much at risk. Your employees will be happier, and you will not need to be concerned about their well being -- or your liability. If there are fewer hazardous materials in your shop, your compliance obligations will be fewer. The environment will be cleaner. You will be prepared for a regulator's inspection, and your corporate image will shine. The old saying is true: an ounce of prevention is worth a pound of cure.

2.2 WHAT P2 TECHNIQUES CAN I USE?

This section presents an overview of pollution prevention techniques that can be incorporated into your prepress, press, and postpress operations and housekeeping activities.

- Prepress operation pollution prevention techniques primarily involve:
 - Activities that extend the chemical and wash bath life
 - Activities that reduce, recover, and recycle the chemicals used in photo-processing operations
 - Activities that reduce energy and input material consumption
 - Activities that eliminate the need for wet processing operations.
- **Press operation** pollution prevention techniques incorporate:
 - Process modifications that reduce ink use at the press and waste ink generated
 - Equipment changes to improve solvent and fountain solution use
 - Use of less toxic or non-toxic inks, solvents, and fountain solution
 - Improvements in handling of and waste management practices for input materials.
- **Postpress operation** pollution prevention techniques focus on:
 - Material substitutions such as switching to water based adhesives
 - Equipment modifications to make finishing operations more efficient.

Exhibit 1 summarizes pollution prevention techniques for the prepress, press, and postpress operations, as well as for housekeeping activities. The exhibit provides a general idea of the options available to you and their potential benefits in your shop. Chapters 4 through 7 present detailed descriptions of each pollution prevention technique. It is important to remember that not every pollution prevention technique will work at every print shop. You should compare and evaluate these pollution prevention techniques to identify those that may help you meet your pollution prevention goals. You will then need to try a select few to determine what works in your shop, but does not compromise the quality of your product. Some pollution prevention techniques are easy; some are more challenging. They all involve changes in how you do business. When you understand how much it costs to comply with all the regulations that apply to your shop, however, we think you will see that changing your operations makes good business sense.

Each New England state has a staff of pollution prevention experts who can provide additional information and confidential on-site technical assistance, **free of charge**. You should work with the pollution prevention office in your state, using this manual to guide your inquiries. Chapter 9 presents a list of contacts.

So, get going! Start today by making a commitment to pollution prevention, and give your print shop a business advantage in an increasingly competitive industry.

Exhibit 1. Summary of Pollution Prevention Techniques				
Pollution Prevention Technique	Benefits	Waste Reduced	Page No.	
PREPRESS				
Cover Photoprocessing Chemical Containers	Reduction of the amount of raw materials lost to evaporation.	Air emissions	72	
Aqueous Platemaking	Elimination of hazardous plate developer waste. Increased employee safety because of reduced exposure to chemicals.	Hazardous waste Air emissions	53	
Extending Bath Life	Cost savings on raw materials. Reduction in the amount of wastewater or hazardous waste generated. Increased employee safety by reduction in exposure to chemicals.	Wastewater Hazardous waste Air emissions	25	
Reduce Photoprocessing Wastewater • Wash Water Control Units • Wash Water Recirculation Units • Countercurrent Washes	Cost savings from decreased fresh water use. Reduced wastewater discharge. Decreased energy consumption.	Wastewater	25-27	
Silver Recovery • On-Site • Off-Site	Revenue from on-site recovery of silver. Increased employee safety due to reduced exposure to waste fixer. Cost savings from recovery of fixer solution.	Wastewater Hazardous waste	27-29	
Material Substitution	Reduction in the amount of hazardous waste, wastewater, and solid waste generated due to use of less hazardous or nonhazardous materials.	Wastewater Hazardous waste Solid waste	29	
Electronic Imaging and Laser Platemaking	Reduction in the amount of input materials used, thereby resulting in a reduction in the amount of waste generated. Increased productivity because of reduced manual labor.	Wastewater Hazardous waste	30	

Exhibit 1. Summary of Pollution Prevention Techniques (Continued)				
Pollution Prevention Technique	Benefits	Waste Reduced	Page No.	
PRESS				
Ink Inventory Control	Cost savings from reductions in out-dated materials and waste ink disposal costs.	Hazardous waste	50-51	
Improve Press Cleaning Practices	Reductions in the amount of waste ink generated and the amount of cleaning solvent and towels used.	Hazardous waste	52	
Recycle Used Ink	Reductions in ink use and ink disposal.	Hazardous waste	52	
Automated Press Adjustments for Makeready	Increased quality control. Reductions in waste paper and ink generation.	Hazardous waste Solid waste	53-54	
Alternative Inks	Reduction in hazardous materials used, waste generated, hazardous waste disposal costs, Volatile Organic Compound (VOC) emissions, and the amount of solvent needed to clean the equipment.	Hazardous waste Air emissions	54-55	
Alternative Fountain Solutions	Will help meet VOC emission limitations. Increase in indoor air quality because of reduced emissions. Elimination of the use of Isopropyl Alcohol (IPA) fountain solutions.	Air emissions	72	
Automatic Ink Levelers and Antiskinning Spray	Reductions in ink use and ink disposal.	Hazardous waste Solid waste	56	
Alternative Cleaning Solutions	Reduced VOC emissions. Improved indoor and regional air quality. Increased employee safety from reduction in handling toxic chemicals.	Air emissions	72	
Reuse and Recycle Waste Solvents	Reductions in the amount of new solvent used and the quantity of waste solvent that must be disposed.	Hazardous waste	56	
Reduce Fountain Solution Temperature	Reductions in fountain solution losses. Reduction in amount of waste paper and ink generated from poor press runs. Less evaporation of IPA.	Air emissions Hazardous waste Solid waste	73	
Automatic Blanket Cleaners	Cost savings from decreased solvent use and labor required for cleaning the presses. Increased employee safety from reduced solvent handling and exposure. Reductions in solvent use, waste solvent generation, and VOC emissions.	Hazardous waste Air emissions	57	

Exhibit 1. Summary of Pollution Prevention Techniques (Continued)				
Pollution Prevention Technique	Benefits	Waste Reduced	Page No.	
POSTPRESS				
Water-Based Adhesives for Post Press Operations	Reduction in solvent-based adhesives used. Reduction in VOC emissions. Reduction in waste disposal.	Air emissions	73	
Increase Use of In-Line Finishing	Reductions in labor. Increase in rate of production.	Solid waste	75	
HOUSEKEEPING	ì			
Material Handling and Storage	Cost savings resulting from a reduction in the amount of raw materials discarded due to damage or expiration.	Hazardous waste Solid waste	51	
Reduce Materials Used	Cost savings from decreased material purchases. Reduction in waste generated by printing operations.	Solid waste	75	
Reuse Materials	Cost savings from reuse of materials in printing operations and reduction in solid waste disposal.	Solid waste	75	
Recycle Scrap	Cost savings from reduced waste disposal. Reductions in environmental impacts of landfilling or trash incineration.	Solid waste	75	
Solvent Sink For Parts Cleaning	Reductions in the amount of new solvent used and the quantity of waste solvent that must be disposed.	Hazardous waste	57	

Here is how to get started:

- 1. Read Chapter 3 to get a sense for the wastes you may generate.
- 2. Identify your problem waste first. This will include waste that you generate in high volume, that is costly to dispose, that is highly toxic, or that is heavily regulated.
- 3. Read the P2 suggestions in this manual and seek additional information if you need it. Talk to your staff, the experts listed in this manual, other printers, or your vendors.
- 4. Keep an eye on results. You will want to know whether the changes are helping and how much money you have saved. Your shop will be proof that pollution prevention pays -- you will know you are on the right track if your shop is clean and orderly (e.g., no towels lying around, containers are closed, waste management areas are neat).
- 5. And last, but definitely not least, pat yourself on the back and enjoy the advantage! The New England Environmental Assistance Team (the NEEATeam) has a program to provide you with the public recognition you deserve for a job well done. Call 1-800-90NEEAT for more information.

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3. WHAT WASTES DO I GENERATE DURING PRINTING OPERATIONS?

If you are a lithographic printer, you generate waste. This waste can take one of the four forms called *waste streams*:

- Wastewater
- Hazardous waste
- Air emissions
- · Solid waste.

Waste will be generated throughout prepress, press, and postpress operations, as well as housekeeping activities.

Exhibit 2 presents examples of typical lithographic wastes. (Note: This exhibit is not all inclusive. Depending on the input materials used in your shop, your shop may generate waste that is not listed.) Each waste is grouped in the table according to the waste stream (i.e., wastewater, hazardous waste, air emissions, or solid waste) in which it is commonly found in a print shop. For example, used, treated fixer and used developer are most commonly put in a print shop's wastewater, rather than being drummed and disposed of as a hazardous waste. So, you will find this waste listed in the wastewater section of the exhibit, and you will need to pay careful attention to Chapter 4 of this manual in order to comply with the appropriate regulations. Similarly, if you dispose of this waste in drums as hazardous waste, you should read Chapter 5 of this manual and follow those regulations.

To identify the regulations that may impact your shop and the pollution prevention opportunities available follow these four steps:

- 1. Use Exhibit 2 as a general guide to identify the waste your shop generates.
- 2. Identify any waste generated at your shop that is **not** listed in Exhibit 2. Refer to the resources listed in Chapter 9 if you are not sure whether some aspect of your process is generating a waste.

- 3. Determine how you currently manage each waste you generate by answering the question, "In what form or waste stream does this waste leave my shop?"
- Refer to the following chapters for information on regulatory compliance and pollution prevention for each of your shop's waste streams:
 - Wastewater -- Chapter 4
 - Hazardous Waste -- Chapter 5
 - · Air Emissions -- Chapter 6
 - Solid Waste -- Chapter 7.

Exhibit 2. Examples of Typical Lithographic Wastes				
PREPRESS WASTE				
Wastewater	Solid Wastes			
 Used, treated fixers Used developers Used activators/ stabilizers Plate developer Rinse water 	 Chrome-based system cleaners Non-empty aerosol cans Discarded, unused, or outdated chemicals Used, untreated fixers Used shop towels contaminated with hazardous waste** Proofing system chemicals 	 Volatile Organic Compounds (VOCs) or toxics emitted from Film cleaner Proofing systems solvents 	 Empty containers Developed or out- dated film Out-dated materials Used or damaged plates Used, empty aerosol cans Used shop towels** 	
	PRESS W	ASTE		
Wastewater	Hazardous Wastes*	Air Emissions	Solid Wastes	
 Spent fountain solution Rinse water 	 Waste ink containing solvents Waste lubricating oil (if defined as hazardous waste by your state) Used blanket or roller wash Spent cleaning solvent Used shop towels contaminated with hazardous waste** Used parts washer solvent 	 VOCs or toxics emitted from Solvents from heatset inks/ink oils Isopropyl alcohol Cleaning solvents Coatings Solvent-saturated shop towels Fountain solution additives 	 Ink containers Used plates Used blankets Off-spec printings Paper wrappings Paper roll ends Unprinted paper roll cores End caps Used shop towels** 	

* A waste is a "hazardous waste" if it is listed in federal or state regulations or if it exhibits hazardous characteristics. (See Section 5.1 for the definition.) The list of hazardous waste here assumes that the waste meets one of these criteria.

** Check with your state's hazardous waste office (see the information presented in the pocket at the end of this manual) to help you determine whether your shop towels are hazardous.

Exhibit 2. Examples of Typical Lithographic Wastes (continued)			
POSTPRESS WASTE			
Wastewater	Hazardous Wastes*	Air Emissions	Solid Wastes
 Water-based inks from ink jet operations Water-based coatings Water-based adhesives 	Used shop towels contaminated with hazardous waste**	 VOCs or toxics emitted from Adhesives Coatings 	 Waste paper Waste shipping materials Scrap board Excess adhesives Used shop towels** Non-recyclable paper Empty containers
	Hous	SEKEEPING WASTE	
Wastewater	Hazardous Wastes	Air Emissions	Solid Wastes
Cleaning wastewater	 Waste oil (if defined as hazardous waste by your state) Absorbent materials used to pick up residual oils (if defined as hazardous waste by your state) or solvents Used shop towels contaminated with hazardous waste** 	 VOCs or toxics emitted from Miscellaneous cleaners Paints Parts washers 	 Empty containers Used shop towels** Pallets

* A waste is a "hazardous waste" if it is listed in federal or state regulations or if it exhibits hazardous characteristics. (See Section 5.1 for the definition.) The list of hazardous waste here assumes that the waste meets one of these criteria.

** Check with your state's hazardous waste office (see the information presented in the pocket at the end of this manual) to help you determine whether your shop towels are hazardous.

4. How Do I COMPLY WITH WASTEWATER DISCHARGE REGULATIONS?

The discharge of wastewater from an industrial source, including your lithographic print shop, will generally be covered by either the Federal Clean Water Act or the Safe Drinking Water Act. This chapter explains these laws and the implementing regulations which establish the basic framework for keeping pollution, including toxic pollutants, out of our rivers, lakes, and oceans. Since the primary sources of such toxic water pollutants are industrial facilities, the U.S. Environmental Protection Agency (EPA) has taken steps to regulate these facilities.

4.I DO I KNOW WHERE MY WASTEWATER GOES?

You must be able to answer "yes" to this question. Discharges to unknown locations can harm your workers and the environment and can expose your shop to potential liability.

Your printing wastewater most likely gets discharged to one of three locations:

- Sewers leading to publicly owned treatment works (POTW). After treating the wastewater, the POTW discharges it to a surface water, such as a river, lake, or stream.
- Septic and leach field systems (and other subsurface disposal systems).
- Surface waters, including ponds, lakes, oceans, streams, wetlands, and other water bodies.

Federal, state, and local regulations regulate discharges to each of these locations. To comply with these regulations, you should have a good understanding of **where** your wastewater is being discharged and **what** your wastewater discharge contains.

4.2 WHAT DO MY PRINTING WASTEWATER DISCHARGES CONTAIN?

Now that you have identified where your wastewater goes, the next step is to determine what is in it. Wastewater is commonly generated during prepress, press, and postpress operations. Exhibit 2 lists lithographic wastes (e.g., used fixer and spent fountain solution) typically found in wastewater (see Chapter 3). While this list is not all inclusive, it gives you a general idea of the kinds of waste generated in each operation that may end up in your shop's wastewater. For most shops, silver discharges will be of primary concern.

After you identify the waste in the wastewater generated by your facility, you must determine how best to manage it according to the regulations that apply. Here are the steps you should follow to responsibly manage wastewater from your print shop:

- Follow the compliance guidelines listed in Sections 4.3 through 4.5 according to where your wastewater is discharged.
- Comply with all applicable federal, state, and local regulations, including obtaining the necessary permits or registrations. The pocket at the end of this manual contains a summary of your state's requirements.
- Practice good environmental management. (Section 4.6)
- Prevent pollution. (Section 4.7)

4.3 WHAT MUST I DO IF I DISCHARGE TO THE SEWER?

If your print shop discharges wastewater into a sewer system that leads to a municipal treatment plant, also known as a publicly owned treatment works, you are subject to the requirements discussed in this section. Sometimes, you may hear these referred to as the requirements for indirect discharges. Usually, POTWs treat domestic household wastes using filtration and biological treatment processes. Because certain pollutants present in industrial discharges can adversely affect the POTW's treatment processes or pass through the plant directly to surface water without receiving adequate treatment, POTWs generally cannot handle certain types of industrial pollutants in large quantities.

Federal pretreatment regulations were developed to prevent or minimize the discharge of certain pollutants to the POTW. These regulations, apply to all industrial facilities, including lithographic printers, that discharge *industrial wastewater* to POTWs. *Industrial wastewater* includes any sources of non-sanitary wastes (i.e., process wastewater). Because EPA or the states often delegate the authority to enforce these requirements to the POTWs, you should familiarize yourself with your POTW's local requirements.

Two types of pretreatment requirements exist: those for all industry (known as *general pretreatment standards*) and those for specific industries (known as *categorical pretreatment standards*):

- General pretreatment standards establish minimum discharge requirements for all industrial dischargers, including lithographic printers. These standards prohibit all industrial users from discharging specific pollutants to POTWs. Exhibit 3 lists the types of pollutants prohibited by the general pretreatment standards.
- Categorical pretreatment standards apply to specific types or categories of industrial facilities or processes. As of the date of this printing, such standards have **not** been established for the printing industry.

In addition to the general pretreatment standards, your shop may be subject to requirements established by your local POTW. That is, the POTW may impose its own wastewater discharge limits upon your industrial discharges in order to protect its treatment plant and to meet its own direct discharge permit limits. Where POTW requirements are **more** stringent than federal requirements, they will apply in lieu of the federal requirements. In all instances, you must notify and get approval from your POTW to discharge industrial wastewater to the POTW.

In addition to the above, you also **may** need to get a wastewater discharge permit from the local POTW or the state if one of the two following conditions exist:

- Your print shop is considered a *significant industrial user* (SIU) (Exhibit 4 lists the criteria that would make you an SIU.)
- You are not an SIU but the POTW to which you discharge requires that all industrial dischargers, including small dischargers, have a permit.

(Check with your local POTW to find out if you must obtain a permit in either situation.)

Regardless of whether a POTW issues a local permit to your facility, you must check with your state environmental agency to find out if a state permit is also required for a discharge to a POTW. Some states may have a permit program specifically for discharges to the sewer. Overall, even if a POTW or the state does not require a permit, you should notify and obtain approval from the POTW to discharge into the sewer system.

If you discharge to a POTW, you may also be required to monitor, submit reports, and keep records of your industrial wastewater discharges. Certain reporting requirements apply to all discharges to the POTW. Exhibit 5 presents the most significant of these requirements. In addition, if your shop must obtain a permit, as discussed above, your facility-specific permit may contain additional monitoring, reporting, and recordkeeping requirements.

Exhibit 3. Pollutants Prohibited From Discharge to Your POTW By the Federal Pretreatment Regulations

Some of the general types of prohibited pollutants include:

- Pollutants that cause pass through or interference at the POTW
- Pollutants that create a fire or explosion hazard in the POTW, including waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit
- Pollutants that cause corrosive structural damage (i.e., any wastewater with a pH less than 5)
- Pollutants that are solid or viscous and can obstruct the wastewater flow
- Pollutants that are released in a discharge at a flow rate or concentration that will cause interference at the POTW
- Heat in amounts that will inhibit biological activity at the POTW, and, in any case, discharges that will cause the temperature at the POTW to exceed 104 degrees Fahrenheit
- Petroleum oil, non-biodegradable cutting oil, or products of mineral oil in amounts that will cause interference or pass through
- Pollutants that result in the presence of toxic gases, vapors, or fumes in the POTW that may cause acute worker health and safety problems
- Any trucked or hauled pollutants, except at discharge points designated by the POTW.

See 40 Code of Federal Regulations Section 403.5 (40 CFR § 403.5) for a complete list.

Exhibit 4. Conditions That Make Your Shop Subject to SIU Permit Requirements

If your shop meets at least one of the following criteria, you should check with the local POTW or state to receive information about obtaining a permit:

- Discharges an average of 25,000 gallons or more per day of process wastewater (excluding sanitary and noncontact wastewater)
- Contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant
- Is determined to have a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement
- Is subject to categorical pretreatment standards (as stated previously, none has been established for lithographic printers).

Exhibit 5. Reporting Requirements For All Indirect Dischargers			
Requirement*	Time Frame		
Notify the POTW or state immediately of a wastewater discharge that could cause problems to the POTW, including slug loading (defined as any relatively large release of a pollutant that might not ordinarily cause a problem when released in small quantities), spills, and unpermitted pollutants.	Immediately		
Notify the POTW or state of a substantial change in your shop's wastewater discharge.	Prior to the change		
Notify the POTW, state hazardous waste authorities, and EPA Regional Waste Management Division Director of the Office of Site Remediation and Restoration of a hazardous waste discharge. This is a one-time written notification required of those who discharge more than 15 kg (33 lbs) of a hazardous waste in a month, or, if the waste is acutely hazardous, any amount that is discharged. Contact EPA, or see 40 CFR Part 261, for what must be included in the written notification. Note: A list of acutely hazardous wastes is presented in 40 CFR § 261.30(d) and 40 CFR § 261.33(e).	One-time written notification for each hazardous waste discharge		

* For a complete list of reporting requirements, see 40 CFR § 403.12.

How to Comply If You Discharge Wastewater to a POTW

- ✓ Obtain a copy of the state and local Sewer Use Regulations or Ordinance by contacting your state and local POTW to determine what requirements apply to your facility. As a lithographic printer, you should pay particular attention to the local silver limit.
- Contact the POTW and state to determine whether your facility must obtain a permit. Remember, even if you are not required to obtain a permit, you may be required to obtain approval for your wastewater discharge.
- Meet, at a minimum, the federal general pretreatment standards, even if your POTW does not require you to obtain a permit.
- ✓ If you have a permit, verify that your wastewater discharge is meeting the effluent limits in your permit and that your facility is not discharging any prohibited pollutants (see Exhibit 3) to the POTW.

- Conduct monitoring, reporting, and recordkeeping activities (if applicable) for your industrial wastewater discharge. Maintain records for all samples collected for monitoring activities for at least 3 years. These records, which should be available for review at any time, must include:
 - Date, place, method, and time of sampling and the names of the person(s) taking the samples
 - Date(s) the laboratory performed the analyses and the analytical methods used
 - Laboratory that performed the analyses
 - Results of the analyses.
- ✓ Notify the state and/or POTW of any discharges that indicate a change in your normal discharge (see Exhibit 5).

4.4 WHAT MUST I DO IF I DISCHARGE TO A SEPTIC SYSTEM OR OTHER SUBSURFACE WASTEWATER DISPOSAL SYSTEM?

The Safe Drinking Water Act established the basic framework for protecting the drinking water of the United States. This act requires EPA to regulate underground injection of waste fluids through **subsurface wastewater disposal systems**, such as your septic system, that discharge waste into, or above, the underground sources of drinking water. These regulations, often referred to as the **Underground Injection Control (UIC) Regulations**, are designed to protect the country's drinking water supply. EPA has authorized all six of the New England states to implement the UIC program.

Industry and commercial businesses commonly operate subsurface wastewater disposal systems. These disposal systems can include septic systems, leach fields, leaching pits and trenches, dry wells, cesspools, and wastewater disposal wells. Subsurface disposal systems can pose a significant threat to underground sources of drinking water because they are numerous, often are located near public water supplies, and are used to dispose of a wide range ot nonhazardous and hazardous wastes.

It is important to know what you discharge to your subsurface wastewater disposal system. Wastes discharged to these disposal systems typically include liquid waste, process wastewater, non-contact cooling water, sewage, and storm water. Fluid wastes of this sort commonly contain wash water, spill drainage,

and storm water from maintenance areas, hazardous substance storage areas, processing and manufacturing areas, and fueling areas and are susceptible to contamination by hazardous materials and wastes. If your wastewater disposal system(s) is not connected to a municipal sewer or does not discharge to a surface water, you may be using a septic system or other subsurface wastewater disposal system to dispose of your waste. Your state regulates your subsurface wastewater disposal system(s). If you use a septic system or other subsurface wastewater disposal system:

- You may not discharge hazardous waste from your lithographic printing operations to your subsurface disposal system. Subsurface discharges of hazardous materials and wastes that render drinking water undrinkable or that endanger public health are prohibited by law. (See Chapter 5 to determine which of your printing wastes are hazardous.)
- ✓ You must obtain a permit from your state.
- ✓ You may only discharge sewage wastewater (i.e., sanitary waste) or, if you have permission from your state, some forms of industrial wastewater, to your disposal system.

How to Comply If You Discharge to a Subsurface Wastewater Disposal System

- ✓ You are required to report the operation of your subsurface wastewater disposal system to the New England state in which you operate. Information that must be reported includes your facility name and address, the name and address of the owner(s), the nature and volume of waste being discharged, and the operating status of each disposal system. If you have not reported your system and would like a reporting form or more information about reporting requirements, please call the UIC program in your state. (Please refer to your state's requirements provided in the pocket at the end of this manual.)
- ✓ The discharge of commercial or industrial wastewater to a subsurface wastewater disposal system is usually not allowed. Acceptable disposal systems must have a state permit. Contact your state UIC program to get more information about applicable regulations governing commercial and industrial subsurface wastewater disposal. (Please refer to your state's requirements provided in the pocket at the end of this manual.)

- ✓ If your facility disposes of sewage that is generated by 20 or more people per day to a septic system or other subsurface wastewater disposal system, you are subject to UIC regulations, even if you do not discharge industrial wastewater to the disposal system. Contact your state UIC program to get more information about applicable UIC regulations. (Please refer to your state's requirements provided in the pocket at the end of this manual.)
- You may not discharge hazardous wastes into your septic system or other subsurface wastewater disposal system. Discharge of hazardous waste is prohibited by law. If any amount of hazardous waste is discharged to a subsurface wastewater disposal system, you must stop the discharge and immediately notify your state UIC program. (Please refer to your state's requirements provided in the pocket at the end of this manual.)

4.5 WHAT MUST I DO IF I DISCHARGE TO SURFACE WATER?

Any wastewater (excluding storm water, which is discussed below) from your shop that is discharged directly into surface water, including a pond, lake, river, tributary to a river, wetland, and ocean, requires you to apply for and obtain a permit under the National Pollutant Discharge Elimination System (NPDES) program. An NPDES permit sets limits on the amounts of pollutants that can be discharged to surface waters. The NPDES permit system is designed to protect the quality of the water bodies into which wastewater is discharged. Consequently, stringent limits are imposed on the amounts and concentrations of the pollutants that may be discharged.

NPDES Permits. The NPDES program is implemented either by EPA or by states running an equivalent EPA-approved program. Therefore, your facility may be required to submit an application and receive a permit from EPA or the state. Please refer to Section 4.6 to determine if you should apply to EPA or your state for a general or individual NPDES permit. In addition, in states where EPA is the permitissuing authority, the states have separate wastewater permit requirements and issue their own additional permits.

If your lithographic print shop is required to get an NPDES permit, your permit will:

- Specify the amount of pollutants that you can discharge, depending on either the wastewater treatment technology in your shop or on the specific water quality standards of the body of water to which your shop discharges, whichever is more protective of the environment.
- Require that you routinely conduct monitoring and submit reports (generally on a monthly schedule). Such requirements are determined on a facility-specific basis; .however, some reporting requirements apply to all facilities.
- Require that you maintain all monitoring records for at least 3 years.
- Contain other site-specific requirements, including:
 - Construction schedules
 - Best management practices
 - Whole effluent toxicity testing
 - Spill prevention plans.

Storm Water NPDES Permits. Certain industrial facilities that discharge storm water must apply for a storm water permit. You must obtain a storm water NPDES permit if the answer to all three of the following questions is YES:

1. Do you have a storm water discharge?

The answer is YES if there is a *positive* collection or conveyance system, **and** it culminates at a point source (e.g., a pipe, ditch, channel, tunnel well, or container). A positive collection or conveyance system is any type of system that is meant to collect storm water and remove it off-site (e.g., parking lot drains or ditches to convey storm water off-site). 2. Does this point source discharge to regulated waters?

The answer is YES if the storm water is discharged to a *surface water*, **or** if it is discharged to a separate storm sewer, which is then discharged to surface waters. Surface water is defined broadly and includes rivers, ponds, oceans, and wetlands.

3. Do you conduct an industrial activity subject to the regulations?

As a lithographic printer, your Standard Industrial Classification (SIC) code is 27 (or possibly 26), so the answer is YES. For industries in this group, you have to ask one more question: Is there exposure or potential exposure of input materials, finished products, byproducts, or material handling equipment to storm water? If the answer is YES to this final question and this storm water is discharged to surface waters, you are subject to the storm water regulations and must obtain a storm water permit.

If you are unsure about whether you should answer yes to any of the above, or you are unclear about whether you have a *point source* or discharge into *surface water*, call one of the resources listed at the end of this chapter.

How to Comply If You Discharge to Surface Water

✓ Apply for and obtain an NPDES permit for wastewater and, if applicable, for storm water. Contact EPA or your state regulatory agency to find out how to obtain an NPDES permit application for wastewater and/or storm water discharges. (Please refer to your state's requirements provided in the pocket at the end of this manual.)

- Ensure that your shop meets the effluent limits in your NPDES permit. Conduct monitoring, reporting, and recordkeeping activities for your permitted discharges (wastewater and/or storm water).
- ✓ Notify the permitting authority:
 - Of a noncompliance that has occurred with your wastewater discharge that may endanger health or the environment within 24 hours of becoming aware of the violation **and** in writing within 5 days
 - Of any planned physical alterations or additions that may affect your wastewater discharge at your shop as soon as possible
 - Of any planned changes in your wastewater discharge that may result in noncompliance (advance notice required)
 - Of the transfer of the facility to a new owner as soon as possible in advance of the transfer.

4.6 GOOD ENVIRONMENTAL MANAGEMENT PRACTICES

Here are some tips on good environmental management practices that could help save you money and improve your operations:

- Manage silver-bearing wastewater properly. Do not put untreated fixer down the drain. Reclaim and recycle the silver prior to wastewater discharges (see methods described in Section 4.7).
- If you use a silver recovery unit, operate and maintain it according to the manufacturer's specifications.
- Place signs near all sinks and drains in the work area prohibiting disposal of press-cleaning solvents, inks, and untreated silver-bearing waste. (Remove or photocopy the sample signs found on the next two pages, and place above or near the sinks and drains in your shop.)
- Properly manage wastewater discharges to septic systems. Ensure that you have the proper permits. It is good practice to avoid discharging process chemicals to your septic system.
- · Never discharge industrial wastewater to floor drains!
- Extend the lives of photoprocessing baths by adding replenishers and regenerators.
- · Keep process baths covered to preserve their quality and life.
- Reduce drag-in of contaminants by using a squeegee on film between baths. Reduce drag-out of solution by adding drip boards and extending drip time.
- Use non-hazardous developers and finishers.
- Add glass marbles to developer solution to bring the liquid level up to the brim to reduce oxidation.



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4.7 POLLUTION PREVENTION OPPORTUNITIES FOR WASTEWATER DISCHARGES

This section describes pollution prevention (P2) opportunities that can reduce wastewater discharges. Information on whether the technique is easy or more difficult to use is included next to each listing, followed by a description of the technique and its benefits. Each discussion provides information on the relative cost of the technique and the waste stream that can be reduced using each technique, where possible. For more information, please contact the individuals listed in Chapter 9.

Extending Bath Life

Easy

Technique:

To reduce generation of waste and fixer solution, this P2 technique can be implemented with **no capital expenditure** and **no equipment modifications** by your print shop.



You can extend the life of your fixer bath by the following activities:

- Adding ammonium thiosulfate (hypo), which doubles the allowable concentration of silver buildup in the bath.
- Using an acid stop bath prior to the fixing bath if you do tray processing.
- Adding acetic acid to the fixing bath as needed to keep the pH low.
 - Changing the fixer bath solution only when it is no longer effective, rather than changing photoprocessing fixer bath solutions on a set schedule. Manufacturer chemistry replenishment schedules are typically conservative; therefore, you may be discarding bath solution as waste when it is still effective.

You should discuss these options with your vendors to see what will work for your shop.

Benefits:

- Cost savings on the purchased fixer.
- Decrease in the volume of waste fixer solution generated.
- Increase in employee safety because of reductions in the number of changeouts and, therefore, reductions in employee handling of and exposure to bath solution chemicals.
- Costs:
 Use of these techniques can increase the chemical concentrations in your baths. Thus, if you discharge wastewater to your local POTW, your NPDES permit limits or treatment practices may be affected. Contact your wastewater treatment plant or, if you are a direct discharger, EPA or the state, for guidance prior to making these changes.

Wash Water Control Units

Technique:

This P2 technique will assist you in reducing your fresh water use and wastewater generation, which in turn will result in cost savings to your print shop and decreased demands on the POTW to process your wastewater. Many automatic photoprocessors provide a continuous flow of fresh water across the film, while others require continuous replenishment of a wash bath when film is processed. A wash water control unit can be added to automatic photoprocessors to reduce fresh water use. A wash water control unit is basically an electronic valve that only turns on when film is being processed. Wall-mounted control units, which control the flow and temperature of the water to the wash bath, can be installed with any photoprocessor.

Easy

Benefits: • Cost savings can be realized from decreased fresh water use and reduced wastewater discharge. Here is an example to help you determine your cost savings from the use of a wash water control unit:

- ABC Photoprocessor uses up to 2.6 gallons of wash water per minute. If the wash water were allowed to run for an 8-hour period, up to 1,248 gallons of water would be required. If running water is needed for only 10 percent of the 8-hour period, a control unit could reduce water consumption by up to 1,124 gallons.
 - Assuming a savings of up to 1,120 gallons of water per day, at a cost of \$1.02 per unit (1 unit is 100 ft³), a savings of up to \$45 per month (up to \$540 per year) would be realized. Wastewater discharge savings may amount up to \$190 per month (up to \$2,280 per year), at a discharge fee of \$4.25 per unit. Your payback period to recover the cost of the unit could be less than 1 year.

Costs: • A water control unit costs approximately \$1,200.

Wash Water Recirculation Units

- *Technique*: This pollution prevention technique will assist you in reducing your fresh water use and wastewater generation, which in turn will result in cost savings to your print shop and decreased demands on the POTW to process your wastewater. Water recirculation units can be installed to reuse photoprocessing wash water in film and plating processing equipment.
- *Benefits:* Reduces fresh water use, wastewater discharge, and energy consumption associated with heating the wash water baths.
- Costs:
- The costs associated with installing water recirculation units vary among print shops. Capital expenditures are required for:
 - The water recirculation unit (a minimum of \$500)
 - Replumbing of the wash water bath system
 - Ongoing operation and maintenance.
 - Use of these techniques can increase the chemical concentrations in your baths. Thus, if you discharge wastewater to your local POTW, your NPDES permit limits or treatment practices may be affected. Contact your wastewater treatment plant or, if you are a direct discharger, EPA or the state, for guidance prior to making the changes.
 - Filters from the water recirculation units require disposal and may be considered hazardous waste in some states (check with your state agency).

Countercurrent Washes

Technique: This pollution prevention technique will assist you in reducing your fresh water use and wastewater generation, which in turn will result in cost savings to your print shop and decreased demands on the POTW to process your wastewater. In tray processing, countercurrent washing can replace commonly used parallel tank systems. Countercurrent washing is done by using rinse water in the initial film wash and

Moderate



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introducing fresh water only at the final rinse stage when much of the contamination has already been rinsed off the film.

Benefits:

- Reduces the amount of contamination in processing solutions and conserves water.
- Reduces the volume of fresh water used.
- Reduces the volume of wastewater generated. You can achieve dramatic reductions of up to 90 percent water use with this method. Combining countercurrent washing and automatic controls can cut water use by 99 percent.
- Because water and sewer use rates are increasing, these techniques will yield short payback periods.

Costs:

- The countercurrent washing system requires more space and equipment.
 - Capital expenditures are required for:
 - Equipment maintenance
- Secondary containment to protect the shop in the event of a spill.
- Employees will need to learn proper mixing of chemistry.

Silver Recovery

Silver recovery can be performed either at your print shop or at an off-site recycling facility to reduce silver from your wastewater and generate revenue from the recovery of this metal. This discussion highlights four methods (three on-site and one off-site):

- On-site methods
 - Metallic replacement cartridges
 - Ion exchange and chemical precipitation
 - Electrolytic silver recovery
 - Off-site methods
 - Fixer recycling.

Many printers have determined on-site recovery to be cost-effective compared to disposal costs. Reverse osmosis is another method of silver recovery that is not discussed here because of its costs.

ON-SITE METHODS

Technique: Metallic replacement cartridges -- Silver can be recovered from fixer bath solution through use of a metallic replacement cartridge at your print shop before the solution is discharged to the sewer. As wastewater passes through the cartridge, iron replaces the silver in solution, and the silver settles out as a solid. The metallic replacement cartridge must then be processed off-site to reclaim the collected silver.

Cartridges containing steel wool are connected to the fixer bath overflow in order to trap silver. Silver concentrations can be reduced by up to 99 percent if two cartridges are used in series. Cartridges must be closely monitored to determine when they are spent in order to prevent silver from being discharged to the sewer. Generally, a single cartridge treats at least 150 gallons of fixer solution.

Benefits:

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- Revenue can be generated from the sale of silver (approximately \$70 per troy ounce).
 - This method is readily available and in widespread use in the printing industry.
 - There are no energy needs or plumbing requirements.
 - Little maintenance is required.



Easy

Capital expenditures for the initial metallic replacement cartridge hookup are Costs: generally less than \$50. Ongoing expenses will include 1) the cost of replacement metallic cartridges at approximately \$50 for a 5-gallon cartridge and 2) cartridge collection and processing (\$75 refining fee in addition to an average \$125 collection fee per 5gallon cartridge). Cartridges cannot be reused. Recovery fees may exceed revenues from silver because of the small amount of silver recovered. The cost per gallon of fixer solution is estimated at \$1.60. The wastewater that results contains high iron concentrations. Moderate Electrolytic silver recovery is a pollution prevention technique that can be performed at Technique: your printing facility to recover silver in nearly pure form from wastewater discharges. Two types of electrolytic silver recovery units (SRUs) use a controlled current to remove silver from wastewater solutions: A recirculating SRU is placed "in line" as part of the fixer recirculating system. A recirculating SRU prolongs the effectiveness of the fixer bath by filtering silver to reduce its concentration and replenishing the fixer, thereby reducing the fixer replenishment rate by 60 to 90 percent. A terminal SRU is connected to the overflow discharge hoses of the process. Fixer solution passes through the SRU, where the silver is collected. A terminal SRU may also require a backup metallic replacement cartridge in order to meet applicable local sewer use limits. Both types of units may have either a stationary or rotating cathode. Silver is periodically scraped off the cathode and collected for pickup by a metals recycler. Benefits: Typically, recirculating SRUs remove up to 90 percent of the silver from fixer bath solutions. Revenue can be generated from sale of the silver. It can minimize silver carried into the wash tank. Costs: De-silvered fixer can be reused, thereby reducing fixer chemistry costs. A rotating cathode removes more silver but requires additional maintenance because it has more moving parts than a stationary cathode. Capital expenditures include the purchase of an SRU and the replumbing to install the unit. There are operation and maintenance costs. An SRU can cost between \$700 and \$2,000, and recycler fees vary according to the monthly use of fixer. pH must be closely monitored. Challenging Technique: **Ion exchange** is done by passing wastewater through a number of ion-exchange resins, or by using a strong base-gel anion resin, to selectively remove the silver. The resins are then sent off-site for silver recovery. It is important to choose the correct resin to maximize efficiency of this operation. (Ion exchange is usually a secondary or tertiary process, following electrolytic recovery and/or use of metallic replacement cartridges,

because it is best for silver recovery from dilute solutions.)

lon exchange can be followed by **chemical precipitation**, in which chemicals (e.g., sulfide) are added to wastewater to precipitate silver chloride out of the solution. For this reason, ion exchange is cost effective for larger shops only.

- Benefits:
- Revenue can be generated from the sale of silver (approximately \$70 per troy ounce).
- It can help achieve low silver concentrations in wastewater.
- Costs:
- Automated ion exchange units are only cost effective for processing large amounts of wastewater, because of their high cost. A small unit can cost \$3,000 to \$5,000.
 - The cost of chemicals for precipitation, holding tanks, and supplemental heat input can make this somewhat costly.
 - Employee training or use of chemicals add other costs.

OFF-SITE METHODS

Easy

Technique: **Fixer recycling** can be performed at an off-site licensed recycling facility to recover silver from wastewater discharges. Fixer bath solution is collected at the print shop and is sent to a fixer recycler. The recycler recovers the silver and, in some cases, regenerates the fixer. The recycler must send the silver to a reclamation facility for processing.

Benefits:

- Revenue can be generated from the sale of silver (approximately \$70 per troy ounce).
 - Cost savings can be realized from reduced fixer purchases.
- *Costs:* The cost of collecting the fixer solution and sending it to an off-site treatment facility may cost more than \$2 per gallon.

Material Substitution

Moderate

Technique: By using fewer and nonhazardous input materials, you will generate less hazardous and nonhazardous wastes.

Nonhazardous chemical substitutes may be available to replace hazardous chemicals currently used at your shop. Because many are available, you should ask your vendors to provide you with information about nonhazardous or less toxic chemicals. Examples include:

- Prepress chemistry that eliminates the use of formaldehyde.
 - Photographic intensifiers and reducers that do not contain mercury or cyanides.
- Nonhazardous aerosols, although you should limit your use of aerosols or switch to non-aerosol products, such as manual pump cans or bottles, especially if they can be refilled. (Always return defective cans to your vendor.)

Pre-sensitized plates should be used as an alternative to metal-etched plates because they are nonhazardous and can be recycled for aluminum content. The pre-sensitized plates should be stored under the recommended conditions to maintain effectiveness.
Silverless films are beginning to appear on the market. The benefit of their use is that they typically produce nonhazardous fixer wastes. However, they do require a large capital investment in new technology. As this technology advances, they may become a more viable option for printers.

- *Benefits:* Reduces the volume of wastewater generated.
 - Reduces the volume of hazardous waste generated.

Electronic Imaging and Laser Platemaking

- *Technique:* Computerized electronic prepress systems are now available for image processing. Using an electronic scanner, text, photos, graphics, and layout are entered into the system. The copy is edited on the display monitor rather than on paper.
- *Benefits:* The reduction in the quantity of film, developing chemicals, and paper used during image processing, will, in turn, reduce the amount of waste film, waste paper, waste chemicals, wastewater, and hazardous waste generated.
 - This technique should increase productivity because of the reduced manual labor required for image processing.



Challenging

Costs:

- This technique requires extensive research and evaluation to determine what systems would be right for your operations.
 - A large capital investment is required for the purchase of the computer hardware and software. Electronic prepress systems were initially restricted to large printing facilities because of the high initial capital investment. As computer hardware and software prices become more reasonable, smaller printing facilities will be better able to afford this technique.

5. How Do I COMPLY WITH HAZARDOUS WASTE REGULATIONS?

As a printer, you produce wastes that could be hazardous. Therefore, it is important that you identify and manage them properly to protect yourself, coworkers, and others in your community, as well as the environment. As the waste generator, you are responsible for **all** steps in hazardous waste management, from generation to final disposal.

You can be held liable for any mismanagement of your wastes, even after they leave your facility. So, it is important for you to know the facts.

This chapter explains the hazardous waste law. known as the Resource Conservation and Recovery Act (RCRA), and its regulations which impose many requirements on how you must handle and dispose of the wastes you generate in your print shop. Sections 5.1 through 5.3 focus on the major federal requirements with which you must comply. In many instances, the states impose additional and more stringent requirements on how you handle your wastes. It is critical, therefore, that you review your state's requirements provided in the pocket at the end of this manual and contact your state environmental agency (numbers and addresses are listed in the pocket at the end of this manual) for any additional requirements. Sections 5.4 and 5.5 present information on good environmental management and pollution prevention techniques that address hazardous waste.

Here are the steps you should follow to ensure compliance with this law and to prevent pollution:

- Determine whether you have hazardous waste at your print shop.
- Determine your hazardous waste generator status.
- Meet the eight major requirements for hazardous waste generators.
- · Practice good environmental management.
- · Prevent pollution from hazardous waste.
- Determine your state's hazardous waste requirements.

5.1 Do I Have Hazardous Wastes AT MY PRINT SHOP?

Since you are a printer, the answer will probably be "yes." Hazardous waste is generated during many lithographic printing operations. The following lists will give you an idea of the types of waste you may be generating. (Note: Because each lithographic print shop is unique, this is not all inclusive.) Exhibit 2 (see Chapter 3) presents a profile of typical hazardous waste generated by lithographic printing operations.

Some materials that may be familiar to you and that may be considered hazardous wastes depending on the state you are in include:

- Spent untreated fixer solution/silver-bearing photographic wastes
- Non-empty aerosol cans
- · Certain discarded or unused chemicals
- Waste solvent-based inks
- Spent cleaning solvents
- Used parts washer solvent
- Solvent-contaminated rags
- Proofing system chemicals.

An important source of information about the chemicals you use is the Material Safety Data Sheet (MSDS). The MSDS is provided by your chemical supplier and gives general health and safety information about handling these chemicals. These MSDSs will not provide you with all of the answers to your environmental questions, but they can help you identify your hazardous waste. Exhibit 6 provides a sample MSDS. As you can see, properties of a chemical, such as its pH or flashpoint, are included on an MSDS. To ensure that your MSDSs are current, require your vendors to automatically supply you with an MSDS with new products and to have anyone approving purchases in your business ask for them from the supplier.

	Exhibit 6. Sample MSDS				
MSDS for ISOPROPYL ALCOHO	L				
1 - PRODUCT IDENTIFICATION					
PRODUCT NAME: FORMULA: FORMULA WT: CAS NO.: NIOSH/RTECS NO.: COMMON SYNONYMS: PRODUCT CODES: EFFECTIVE: REVISION #02	ISOPROPYL ALCOHOL CH3CHOHCH3 60.10 67-63-0 NT805000 2-PROPANOL; ISOPROPANOL; SEC-PROPYL ALCOHOL; IPA; DIMETHYLCARBINOL U298,5082,9080 09/03/86				
PRECAUTIONARY LABELING:					
BAKER SAF-T-DATA (TM) SYS HEALTH FLAMMABILITY REACTIVITY CONTACT HAZARD RATINGS ARE 0 TO 4	TEM - 1 SLIGHT - 3 SEVERE (FLAMMABLE) - 1 SLIGHT - 1 SLIGHT - (0 = NO HAZARD; 4 = EXTREME HAZARD).				
LABORATORY PROTECTIVE EQUIPMENT:					
 SAFETY GLASSES LAB COAT VENT HOOD PROPER GLOVES CLASS B EXTINGUISH 	IER.				
PRECAUTIONARY LABEL STATE	EMENTS:				
 WARNING FLAMMABLE CAUSES IRRITATION HARMFUL IF SWALLC KEEP AWAY FROM HI AVOID CONTACT WIT AVOID BREATHING VA KEEP IN TIGHTLY CLO USE WITH ADEQUATE WASH THOROUGHLY IN CASE OF FIRE, USI MAY BE INEFFECTIVE FLUSH SPILL AREA WASH 	OWED OR INHALED EAT, SPARKS, FLAME H EYES, SKIN, CLOTHING APOR DSED CONTAINER E VENTILATION AFTER HANDLING E ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE - WATER				
SAF-T-DATA(TM) STORAGE COL	OR CODE: RED (FLAMMABLE)				

Exhibit 6. Sample MSDS (continued)						
2 - HAZARDOUS COMPONENTS						
COMPO	DNENT	<u>%</u>	<u>0</u>	CAS NO.		
ISOPR	OPYL ALCOHOL	. 90	0-100	67-63-0		
3-PHYSICAL DATA						
	90°C (190°E)	V				
BOILING FOINT.	02 U (100 F)	v				
MELTING POINT:	-89°C (-128°F)	V	APOR DENSIT	Y (AIR=1): 2.1		
SPECIFIC GRAVITY: (H ₂ O=1)	0.79 (BUTYL ACET/	E' ATE=1)	VAPORATION	RATE: 2.83		
SOLUBILITY (H ₂ O):	COMF	PLETE (IN ALI	L PROPORTIO	NS) % VOLATILES BY VOLUME: 100		
APPEARANCE & ODOR:	COLC	RLESS LIQU	JID WITH SLIGH	IT ODOR OF RUBBING ALCOHOL		
4 - FIRE AND EXPLOSIC	ON HAZARD DA	ΤΑ				
FLASH POINT (CLOSED CUP): 12°C (53°F)			NFPA 7	04M RATING: 1-3-0		
FLAMMABLE LIMITS: UPPER - 12.0%			LOWER - 2.0%			
FIRE EXTINGUISHING MEDIA:						
• USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. (WATER MAY BE INEFFECTIVE.)						
SPECIAL FIRE-FIGHTING PROCEDURES:						
 FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL. 				MENT AND SELF-CONTAINED IN POSITIVE PRESSURE MODE THOUT RISK		
UNUSUAL FIRE & EXPLOSION HAZARDS:						
 VAPORS MAY FLOW CLOSED CONTAINE CONTACT WITH STR 	/ ALONG SURF/ RS EXPOSED T RONG OXIDIZEF	ACES TO DIS O HEAT MAY RS MAY CAUS	STANT IGNITIO YEXPLODE SE FIRE.	N SOURCES AND FLASH BACK		
TOXIC GASES PRODUC	ED:					
CARBON MONOXIDE, CARBON DIOXIDE						

Exhibit 6. Sample MSDS (continued)
5 - HEALTH HAZARD DATA
THRESHOLD LIMIT VALUE (TLV/TWA): 980 MG/M3 (400 PPM)
SHORT-TERM EXPOSURE LIMIT (STEL): 1225 MG/M3 (500 PPM)
PERMISSIBLE EXPOSURE LIMIT (PEL): 980 MG/M3 (400 PPM)
TOXICITY: LD50 (ORAL - RAT) (MG/KG) - 5045 LD50 (IPR - MOUSE) (MG/KG) - 933 LD50 (SKN - RABBIT) (G/KG) - 13 LD 50 (IV - MOUSE) (MG/KG) - 1863
CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO
EFFECTS OF OVEREXPOSURE:
 INHALATION OF VAPORS MAY CAUSE HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, IRRITATION OF RESPIRATORY TRACT, AND LOSS OF CONSCIOUSNESS. INHALATION OF VAPORS MAY CAUSE PULMONARY EDEMA. LIQUID MAY BE IRRITATING TO SKIN AND EYES. PROLONGED SKIN CONTACT MAY RESULT IN DERMATITIS. EYE CONTACT MAY RESULT IN TEMPORARY CORNEAL DAMAGE. INGESTION MAY CAUSE NAUSEA, VOMITING, HEADACHES, DIZZINESS, GASTROINTESTINAL IRRITATION. INGESTION MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION.
TARGET ORGANS
EYES, SKIN, RESPIRATORY SYSTEM
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED
ROUTES OF ENTRY
INHALATION, INGESTION, EYE CONTACT, SKIN CONTACT
EMERGENCY AND FIRST AID PROCEDURES
 CALL A PHYSICIAN IF SWALLOWED, DO NOT INDUCE VOMITING IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, FLUSH SKIN WITH WATER.

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Exhibit 6. Sample MSDS (continued)						
6 - REACTIVITY DATA						
STABILITY: STABI	LE HA	ZARDOUS POLYMERIZATION: WILL NOT OCCUR				
CONDITIONS TO AVOID	D: HE	AT, FLAME, OTHER SOURCES OF IGNITION				
INCOMPATIBLES:		RONG OXIDIZING AGENTS, ALUMINUM, NITRIC ACID, SULFURIC ID, AMINES AND AMMONIA, HALOGEN ACIDS AND HALOGEN MPOUNDS				
DECOMPOSITION PRO	DUCTS: CA	RBON MONOXIDE, CARBON DIOXIDE				
7 - SPILL AND DISPOS	AL PROCEDU	RES				
STEPS TO BE TAKEN I	N THE EVENT	OF A SPILL OR DISCHARGE:				
 WEAR SUITABLE P SHUT OFF IGNITIO STOP LEAK IF YOU USE WATER SPRA TAKE UP WITH SAN INTO CONTAINER F FLUSH AREA WITH 	ROTECTIVE C N SOURCES; I CAN DO SO V Y TO REDUCE ND OR OTHER FOR LATER DI I WATER.	CLOTHING NO FLARES, SMOKING, OR FLAMES IN AREA WITHOUT RISK E VAPORS IN NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE SPOSAL				
J.T. BAKER SOLUSO PRODUCT.	RB(R) SOLVE№	NT ADSORBENT IS RECOMMENDED FOR SPILLS OF THIS				
DISPOSAL PROCEDUR	RE:					
DISPOSE IN ACCORE ENVIRONMENTAL RE	DANCE WITH A	ALL APPLICABLE FEDERAL, STATE, AND LOCAL				
EPA HAZARDOUS WAS	STE NUMBER:	D001 (IGNITABLE WASTE)				
8 - PROTECTIVE EQUI	PMENT					
VENTILATION:						
USE GENERAL OR LO	OCAL EXHAUS	ST VENTILATION TO MEET TLV REQUIREMENTS.				
RESPIRATORY PROTE	CTION:					
RESPIRATORY PROT CONCENTRATIONS I VAPOR CARTRIDGE APPARATUS IS RECO	TECTION REQ JP TO 1000 PF IS RECOMME DMMENDED.	UIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT PM, A CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC NDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING				
EYE/SKIN PROTECTIO	N:					
SAFETY GOGGLES,	JNIFORM, API	RON, AND NEOPRENE GLOVES ARE RECOMMENDED.				

Ex	whibit 6. Sample MSDS (continued)		
9 - STORAGE AND HANDLING F	PRECAUTIONS		
SAF-T-DATA(TM) STORAGE COL	OR CODE: RED (FLAMMABLE)		
SPECIAL PRECAUTIONS:			
 BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID KEEP CONTAINER TIGHTLY CLOSED STORE IN A COOL, DRY, WELL-VENTILATED, FLAMMABLE LIQUID STORAGE AREA. 			
10 - TRANSPORTATION DATA A	ND ADDITIONAL INFORMATION		
DOMESTIC (D.O.T.)			
PROPER SHIPPING NAME: HAZARD CLASS: UN/NA: LABELS:	ISOPROPANOL FLAMMABLE LIQUID UN1219 FLAMMABLE LIQUID		
INTERNATIONAL (I.M.O.)			
PROPER SHIPPING NAME: HAZARD CLASS: UN/NA: LABELS:	ISOPROPANOL 3.2 UN1219 FLAMMABLE LIQUID		

What Is Hazardous Waste?

Generally, waste is defined as:

Any solid, liquid, or contained gaseous materials that you no longer intend to use and that you store, dispose or recycle.

A waste is hazardous if it:

• Is *listed* in the regulations

• Exhibits hazardous *characteristic(s)*.

Each hazardous waste has a *code* that you must use as you document shipment of your waste off-site.

LISTED WASTE

A waste is considered a *listed waste* because it either exhibits one of the characteristics described below or contains any number of toxic constituents that have been shown to be harmful to human health and the environment. **Any nonhazardous materials that are**

contaminated with listed waste are considered listed waste.

The types of listed hazardous waste that you may generate include:

- Waste solvents (e.g., toluene, xylene, acetone, and methyl isobutyl ketone), which are classified as "F" wastes
- Unused, discarded or off-specification materials (e.g., unused methanol), which may be classified as "U" wastes.

CHARACTERISTIC WASTE

A waste is considered *characteristic* because it exhibits one or more of the four defined hazardous characteristics, as follows:

• Ignitable (D001) -- Easily catches fire; flashpoint is below 140° F. (See your MSDS.) Please note that the terms "combustible," "flammable," and "ignitable" have different definitions under other federal and state regulations, so they cannot be used interchangeably. An example of a D001 waste is isopropyl alcohol.

- Corrosive (D002) -- Aqueous liquids (liquids containing water) that easily corrode materials (e.g., metal drums) or human tissue and have a pH of less than or equal to 2 or greater than or equal to 12.5. An example is waste battery acid.
- Reactive (D003) -- Potentially explosive or produces toxic gases when mixed with water, air, or other incompatible materials. Printers do not normally generate reactive wastes.
- Toxic (D004-D043) -- If a chemical extract of your waste contains specific constituents, such as cadmium, chromium, or silver, and exceeds specified levels, the waste is hazardous. The waste code varies, depending on which constituents are present. Examples include plate processing chemicals and waste fixer.

Hazardous waste found in the printing industry is most likely to be ignitable or toxic.

HAZARDOUS WASTE CODES

Specific hazardous waste types have designated waste codes. A waste code is a four-digit classification system used by the U.S. Environmental Protection Agency (EPA) to identify hazardous waste on labels, shipping papers, and other records. All federal hazardous waste codes begin with a letter and are followed by numbers. All *listed waste* begins with the lettered "F," "K," "U," or "P," and all *characteristic waste* begins with the letter "D."

In order to determine what the waste code is for your hazardous waste, **you need to look at the regulations**. For the sake of brevity, we have not included copies of any regulations in this manual. You should call your state environmental agency (see your state summary page in the pocket at the end of this manual) to determine where you can obtain a copy of your state's regulations. They are typically available at your State House book store.

5.2 WHAT IS MY HAZARDOUS WASTE GENERATOR STATUS?

If you are a lithographic printer and your operations cause hazardous waste to be generated, you must now determine your *generator status*.

Hazardous waste generators are divided into different status categories, depending on the quantity of hazardous waste generated each month and on the total amount of hazardous waste stored at the printing facility at any time. The measured amount (by weight) of hazardous waste generated at your facility per calendar month determines which hazardous wastes requirements and standards apply to you.

Exhibit 7 lists three federal categories of hazardous waste generators. This chart is included to illustrate the **federal** generation rates and storage time limits applicable to certain generator categories. It is important to note that states may specify different categories than those specified in the federal regulations and that you must meet the requirements specified for your state! Please refer to your state's requirements in the summary pages in the pocket at the end of this manual.

To determine which category applies to your shop, you must count all quantities of hazardous waste that is:

- Generated and collected at your shop prior to treatment or disposal
- · Packaged and transported off-site.

From Exhibit 7, you can see that it pays to be in one of the small quantity generator categories. There is more leeway for storage time, which will allow you to more cost-effectively manage your smaller quantities of hazardous waste. Pollution prevention can help you change your generator status. Section 5.5 presents pollution prevention techniques that may work at your shop.

Your Generator Status

Now that you have accounted for all the hazardous waste that your print shop generates and you have consulted your state's regulations, you can determine your generator status. Note: Because it is possible for your generator status to change from year to year, and even from month to month, it is very important to keep an accurate accounting of how much waste you have on-site at any particular time.

✓ My generator status is: ______

Exhibit 7. Feder	al Categories of Hazardous W Storage Time Limits Allowe	aste Generators and
Generator Category	Monthly Hazardous Waste Generation Rate	Storage Time Limits
Conditionally Exempt Small Quantity Generator (CESQG)	 ≤ 220 pounds (100 kg), ≤ 2.2 pounds (1 kg) acute, or ≤ 220 pounds spill residue from acute 	No Limit
Small Quantity Generator (SQG)	 > 220 pounds (100 kg) and < 2,200 pounds (1,000 kg) or ≤ 2.2 pounds (1 kg) acute 	≤180 days or ≤ 270 days if waste treatment/disposal facility is >200 miles away
Large Quantity Generator (LQG)	 ≥ 2,200 pounds (1,000 kg) or > 2.2 pounds (1 kg) acute 	≤ 90 days

5.3 WHAT REQUIREMENTS MUST HAZARDOUS WASTE GENERATORS MEET?

Hazardous waste generators must comply with eight major requirements:

- · Waste identification
- · EPA identification number
- Container management
- Personnel training
- Hazardous waste shipment labeling and placarding
- Reporting and recordkeeping requirements
- Contingency planning
- Emergency procedures and accident prevention.

Each requirement is explained below. Please ensure that you have met each requirement and refer to your state's requirements, presented in the pocket at the end of this manual.

1. Waste Identification

As a generator, you must determine whether your waste is hazardous. As explained in Section 5.1, the MSDS for each chemical may help you with this determination. The MSDS will identify specific chemical properties of a material, such as whether a material is highly acidic or basic, whether solvents are present, and other chemical properties, such as ignitability (flashpoint).

 Make a list of all the hazardous waste you have at your shop and determine the waste code for each.

- ✓ You may know that a waste is hazardous because of information on a MSDS.
- If you are not sure, you will need help. This may mean calling EPA or your state, a consultant, or a licensed transporter. Or, you may need to send a sample of your waste to a laboratory for them to determine if the waste is hazardous.

2. EPA Identification Number

If your lithographic printing facility generates more than 100 kg (about 220 pounds or 25 gallons) of hazardous waste in any calendar month, you must obtain an EPA identification number. These 12-character identification numbers are part of a national database on hazardous waste activities. Some states also require conditionally exempt or very small quantity generators to have identification numbers. Furthermore, companies that transport hazardous waste and facilities that store, treat, or dispose of regulated quantities of hazardous waste generated by lithographic printing shops must also have EPA identification numbers.

How to Obtain an EPA Identification Number

- Call or write your state hazardous waste management agency or EPA regional office and ask for a copy of EPA Form 8700-12, "Notification of Regulated Waste Activity." You will be sent a booklet containing the twopage form and instructions for filling it out. Note that a few states use a form that is different from the EPA form. If you contact your state first, you will be sent the appropriate form to complete.
- Complete one copy of the form for each of your printing shops where you generate or handle hazardous waste. There is no fee associated with filling out this form. Each site or location will receive its own unique EPA identification number. You must use this identification number on all hazardous waste shipping forms.

An EPA identification number is a unique number that applies to a particular physical printing facility site or location. If you move your printing facility to another location, you must notify EPA or the state of the new location, submit a new form, and obtain a new EPA identification number. If hazardous waste was previously handled at the new location and the new location already has an EPA identification number, that number will be reassigned to your relocated printing facility.

3. Container Management

The following list summarizes the most significant requirements for managing containers of hazardous waste, regardless of their size:

- ✓ Set aside and mark a storage area for your hazardous waste. This is your designated on-site hazardous waste storage area, and it is a collection area for your entire shop. The length of time that you can store hazardous waste in this area depends on your generator category. The type of area and marking requirements are set by your state. (Please refer to your state's requirements provided in the pocket at the end of this manual.)
- ✓ Label and mark all containers of hazardous waste in your hazardous waste storage area. Clearly mark each container with the words "HAZARDOUS WASTE" and with the date the waste was first collected in that container. (Labels for this purpose may be available from the waste hauler or a trade association.) When your waste is shipped off-site, it is important that your transporter is aware of and complies with Department of Transportation marking requirements for the truck used to haul your waste. Further, many states require additional labeling, such as a description of the contents of the container. (Please refer to your state's requirements provided in the pocket at the end of this manual.)
- ✓ You can accumulate up to 55 gallons of hazardous waste in properly labeled containers or drums at or near the various parts of your shop where the waste is generated. This is called *satellite accumulation*. Once 55 gallons have accumulated, satellite waste must be moved to your designated on-site hazardous waste storage area prior to shipment off-site.

- ✓ Containers in satellite accumulation areas must be clearly marked with the words "HAZARDOUS WASTE" or with other wording that identifies the contents of the container. Satellite waste must be moved within 3 days to your shop's designated on-Site hazardous waste storage area. The operator of the process that generated the waste is responsible for this container or drum as long as it is kept separate from the designated storage area; this operator must control the waste accumulated there.
- Mark the EPA waste code on the drum. Although federal regulations do not require marking the EPA waste code on the drum,

most states do require marking, and it is highly recommended.

- Keep containers in good condition, handle them carefully, and replace any leaking ones. If a container is in poor condition, the waste must be transferred to a container in good condition.
- Use containers made of, or lined with, materials that will not react with the waste. Do not store hazardous waste in a container if it may cause rupture, leaks, corrosion, or other failure. For instance, store your fixer in **plastic** drums and your flammable liquids, such as solvents, in **metal** drums.
- ✓ Do not throw away containers with product in them. If you have a container that has less than 1 inch of product or less than 3 percent of the total amount of product remaining, the container can be crushed, recycled, or thrown away. Otherwise, you must scrape out the product on the inside and properly manage it as hazardous waste. There is no federal requirement to triple rinse containers, but your state may mandate this. Please contact your state office for more information.
- ✓ Keep containers closed except when adding or removing wastes. Remember, if a funnel remains in a drum, the drum is considered open. Do not handle or store a container in such a way that may rupture it or cause it to leak.

- ✓ Inspect the containers for leaks or corrosion every week. During your inspection, it is recommended that you make sure that:
 - All drums are labeled or marked appropriately.
 - There is sufficient space to walk in the storage area, and there is required space (36 inches) between rows of drums.
 - All drum lids are closed tightly.
 - There are signs warning other employees that this is a hazardous waste storage area.
 - Drums are not stored on-site longer than you are allowed:
 - -- Large Quantity Generators (LQGs) -90 days
 - -- Small Quantity Generators (SQGs) -180 days or 270 days if the treatment, storage, and disposal facility is more than 200 miles away
 - -- Conditionally Exempt Small Quantity Generators (CESQGs) or Very Small Quantity Generators (VSQGs) - no time limit.
 - Your hazardous waste storage area is in good condition.
 - There is not more waste on-site than your facility is allowed for your generator category. (Please refer to your state's requirements provided in the pocket at the end of this manual.)
 - Drums containing incompatible hazardous waste are stored separately or protected by a structure, such as a dike or berm.

Some states may require that you keep a written record of these inspections. Any problems should be corrected immediately. If any corrections are made, they should be kept on file for at least 3 years and should note any corrections made.

- ✓ If your shop has outdoor accumulation areas, and if you are storing ignitable or reactive wastes, make sure that containers of these wastes are stored at least 50 feet from the your facility's property line as this creates a protective buffer zone.
- Never store 2 or more wastes in the same container if they could react to cause fires, leaks, or other releases.

4. Personnel Training

✓ If you are an LQG or an SQG of hazardous waste, you must train your employees on the procedures for properly handling hazardous waste, as well as on emergency procedures. For LQGs, the training must be formalized and be completed by employees within 6 months of accepting a job involving the handling of hazardous waste, and you are required to provide annual reviews of the initial training.

CESQGs or VSQGs are not required by federal laws to train their employees on waste handling or emergency preparedness, but it is strongly advised!

Proper waste handling can save your shop money in waste treatment and disposal and in lost time due to employee illness or accidents. For information on employee training, please contact the federal or state agencies listed in Chapter 9 and in the pocket at the end of this manual. It is important to note that training you may be required to conduct by OSHA (the Occupational Safety and Health Administration) differs from hazardous waste management training. Make sure you provide both types of training to your employees.

5. Hazardous Waste Shipment Labeling and Placarding

When you prepare hazardous waste for shipment, you must put the waste in properly labeled containers that are appropriate for transportation according to Department of Transportation (DOT) regulations (see Chapter 9). Your transporter should be able to assist you.

If you are an SQG or LQG, you must:

- Write the manifest document number on the drum label. A blank space intended for this purpose is provided on hazardous waste labels available from label distributors.
- ✓ Label all drums using the 4-inch DOT warning labels (available from the waste hauler or a label distributor), which are marked with the proper DOT shipping name and number according to DOT requirements. Usually your hauler will do this.

If you need additional information, you may want to consult the requirements for packaging and labeling hazardous wastes contained in the DOT regulations. To find out what the requirements are for your specific waste, you should contact your state transportation agency. Your state transportation agency, your hauler, or your waste disposal/treatment facility can help you understand the DOT requirements. It may be helpful for you to create a shipping manual with guidance for packing, shipping, and disposal/recycling of all wastes leaving your facility.

6. Reporting and Recordkeeping Requirements

Your printing facility is required to meet various reporting and recordkeeping requirements as part of your hazardous waste management obligations. These requirements are summarized below:

Uniform Hazardous Waste Manifest. The Uniform Hazardous Waste Manifest Form (EPA Form 8700-22) is a multi-copy shipping document that reports the contents of the shipment, the transport company used, and the treatment/disposal facility receiving the wastes. (Exhibit 8 provides a sample manifest.)

The manifest form is designed so that shipments of hazardous waste can be tracked from the site of generation to the final destination (i.e., from "cradle-to-grave"). The hazardous waste generator, the transporter, and the treatment/disposal facility must each sign this document and keep a copy. The waste treatment/disposal facility also must send a copy back to you, so that you can be sure that your shipment was received.

It is important that you receive a signed copy of the manifest from the company that takes your waste. This is your proof that the waste made it to the final destination. If you do not receive a signed copy of the manifest within a reasonable period of time, you may need to file an exception report with EPA and state environmental agencies. (This is a situation you may never encounter. If you do, please contact EPA and your state environmental agency for further information.) The signed copy of the manifest is required to be kept on file for 3 years. You can obtain blank copies of the manifest form from several sources. To determine the best source for you, use this system:

- If the state to which you are shipping your waste has its own manifest, use that manifest form (your waste transporter will know which manifest form is required). Contact the hazardous waste management agency of that state, your transporter, or the waste treatment/disposal facility to obtain manifest forms.
- If the state to which you are shipping your waste does not have its own manifest, use the manifest of the state in which your waste was generated. Contact your transporter or your state hazardous waste agency for blank forms.
- If neither state requires a state-specific manifest, you may use the "general" Uniform Hazardous Waste Manifest (EPA Form 8700-22). Copies are available from some haulers and waste treatment/disposal facilities, or they may be purchased from some commercial printers.

When you sign the certification on Item 16 of the manifest form (see Exhibit 8, presented previously), you are personally confirming that:

- The manifest is complete and accurately describes the shipment.
- · The shipment is ready for transport.
- You have reduced the amount and hazardous nature of your waste to the greatest extent possible (within your budget constraints).

Transporters, recyclers, and waste treatment/disposal facilities may require additional information. Check with them before you prepare a hazardous waste shipment. The states may also have additional requirements that must be followed. Your hazardous waste hauler often will be the best source for packaging and shipping information and will help in completing the manifest. If you have any trouble filling out or using the manifest, ask your waste transporter, your waste disposal/treatment facility operator, or the appropriate contact listed in your state summary page provided in the pocket at the end of this manual. **Biennial Reports.** If you are an LQG of hazardous waste, you must submit a biennial report (EPA Form 8700-13A) on March 1 of each even-numbered year to the appropriate state regulatory office. Some states impose this requirement on SQGs.

Biennial Report applications and instructions can be obtained from your state office (see your state summary page in the pocket at the end of this manual). Copies of biennial reports must be maintained at your shop for 3 years.

Land Disposal Restriction Notification. Land disposal restrictions are regulations prohibiting the disposal of hazardous waste on land without prior treatment of the waste. With every shipment of your waste off-site, you will need to provide a notification that specifies which of the waste you have generated is restricted from land disposal. This notification should be attached to your hazardous waste manifest. This form ensures proper treatment of the waste prior to disposal; copies of each form must be kept for 5 years.

If you plan to ship wastes off-site for recycling, then you may not need a Land Disposal Restriction Notification form for every shipment. For SQGs, a "tolling agreement" can be developed for shipments after the initial shipment. Please contact your state for more information on these agreements and the land disposal restrictions.

lease print or type. (Form designed for use on elite	(12-pitch) typewriter.)		Form Approv	ed. OMB N	o. 2050-00	39. Expires 9-30-88
UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Informa is not law.	tion in the require	3 shaded areas d by Federal
3. Generator's Name and Mailing Address			A. State Ma	nifest Doo	ument Nu	mber
			B. State Ge	nerator's I	D0	
4. Generator's Phone ()			C Chata Tra		-16	
5. Transporter 1 Company Name	6. US EPAID NU	Imber	C. State Tra	nsporter s		
7 Transporter 2 Company Name			E State Tra	Deporter's	-10	
7. Transporter 2 Company Name	8. 03 EFAID NG		E Transport	er's Phone	<u></u>	
9 Designated Eacility Name and Site Addre	ss 10 US FPA ID NI	umber	G State Fac	itity's ID		· · · · · · · · · · · · · · · · · · ·
o. Designated Facility Hame and one Addre						
			H. Facility's	Phone		
		12. Cont	ainers	13	14	
11. US DOT Description (Including Proper Shippin	ng Name, Hazard Class, and ID Number)	No.	Туре С	Total Juantity	Unit Wt∕Vol	I. Waste No.
G a. E						
n e						
R			┡╍┵┥╶┶		╞──┦╴	
O B					1 1	
C.						
	·····		╞╼┷╼┩╵└╴			
d.						
J. Additional Descriptions for Materials Liste	ed Above		K. Handling	Codes for V	Vastes List	ed Above
15. Special Handling Instructions and Addition	nal Information					
16. GENERATOR'S CERTIFICATION: I hereby proper shipping name and are classified, pacl according to applicable international and nati	declare that the contents of this consignment are ked, marked, and labeled, and are in all respects in ional government regulations.	e fully and accu n proper condit	rately describe ion for transpo	d above by ort by highv	, vay	
If I am a large quantity generator, I certify tha	t I have a program in place to reduce the volume a	and toxicity of w	vaste generate	d to the de	gree I have	determined to be
future threat to human health and the environ	iment; OR, if I am a small quantity generator, I hav	e made a good f	aith effort to m	inimize my	waste gene	eration and select
the best waste management method that is a Printed/Typed_Name	vailable to me and that I can afford.				A	Aonth Day Year
	olgrada o					
T 17.Transporter 1 Acknowledgement of Recei	pt of Materials					▃┶───┴──┴───
R Printed/Typed Name	Signature				Λ	Aonth Day Year
N S					1	
18.Transporter 2 Acknowledgement of Recei	pt of Materials		· · · · · · · · · · · · · · · · · · ·		I	
T Printed/Typed Name	Signature				Λ	Nonth Day Year
R						
19.Discrepancy Indication Space						
F A						
20.Facility Owner or Operator: Certification	of receipt of hazardous materials covered by	this manifest	except as no	ted in Iter	m 19.	
Y Printed/Typed Name	Signature				A	Aonth Day Year
					1	1 1 1 1
PA Form 8700-22 (Rev. 9-86) Previous editions a	re obsolete					

Exhibit 8. Sample Manifest

How Do I Comply With Hazardous Waste Regulations?

	UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator's US EPA ID No.	Manifest Document No.	22. Page	Information areas is not law.	in the shaded required by Federa
23.	Generator's Name			L. State Manifest Document Number		
				M. State G	enerator's ID	
24.	Transporter Company Name	25. US EPA ID Num	ber	N. State Tra	ansporter's ID	
				O. Transpo	rter's Phone	
26.	Transporter Company Name	27. US EPA ID Numi I	ber	P. State Tra	insporter's ID	
			29. Cont	ainers	30 3 ⁻	R
28.	US DOT Description (Including Proper	Shipping Name, Hazard Class, and ID	Number)	Type O	Total Ur uantity Wt/	nt Waste No.
a.						
b.						
C .	······································					
d.						
e.						
f.		······································				
g.						
h.						
i.						
S. A	dditional Descriptions for Materials Lis	ited Above	I	T. Handling	Codes for Wa	stes Listed Above
32.	Special Handling Instructions and Add	tional Information				
33.	Transporter Acknowledgement o	f Receipt of Materials				Date
1	Printed/Typed Name	Signature				Month Day Ye
34.	Transporter Acknowledgement o	f Receipt of Materials				Date
	Printed/Typed Name	Signature				Month Day Y
35.	Discrepancy Indication Space					

Exhibit 8. Example Manifest (continued)

How Do I Comply With Hazardous Waste Regulations?

Summary of Recordkeeping Requirements

EPA requires that certain records be kept on file at your shop for 3 years. These records are listed below. Included is a note where the requirements apply to LQGs, SQGs, or both.

- Laboratory analyses or waste profile sheets for determining whether wastes generated by your shop are hazardous [LQG, SQG]
- Copies of all hazardous waste manifests, land disposal restriction notifications, and exception reports [LQG, SQG]
- Copies of all Notification of Hazardous Activity Forms submitted to and received from the state or EPA [LQG, SQG]
- Copies of personnel training plans and documentation that indicates employees have completed the required training [LQG]
- ✓ Copies of your shop's contingency plan [LQG]
- ✓ Copies of your biennial report [LQG].

It is a good idea to have these documents filed neatly in one place at your shop. State or federal inspectors will likely ask for copies of these documents while inspecting your shop.

7. Contingency Planning

A contingency plan will help you look ahead and prepare for accidents involving hazardous waste that could possibly occur at your shop. If you are an LQG of hazardous waste, you are required to have a *written contingency plan*. If you are an SQG of hazardous waste, you must have *basic contingency procedures* in place. Exhibit 9 presents the contingency requirements for LQGs and SQGs. Although a written contingency plan is not federally required for SQGs or conditionally exempt SQGs, it is strongly recommended. It is also important to check with your state and local authorities for any additional contingency planning or emergency preparedness requirements.

8. Emergency Procedures and Accident Prevention

Emergency Procedures. Your contingency plan, discussed in the previous section, must contain facility-specific details on what you have to do if you have an emergency. Specifically:

 In the event of a fire, explosion, or accidental release of hazardous waste, you must notify immediately the National Response Center if the fire, explosion, or other release could threaten human health outside your print shop or when the release has reached surface water. The Center operates a 24-hour toll free number: 1-800-424-8802. As soon as possible, have the hazardous waste and any contaminated materials or soils cleaned up by an appropriately trained person.

ANYONE WHO IS REQUIRED TO CALL THE NATIONAL RESPONSE CENTER AND DOES NOT IS SUBJECT TO A \$10,000 FINE, A YEAR IN JAIL, OR BOTH. If you are an owner or manager of a print shop and you fail to report a release, you may have to pay for the entire cost of repairing any damage, even if your shop was not the single or main cause of the damage.

As stated above, the RCRA regulations require that emergency telephone numbers and locations of emergency equipment be posted near telephones. This means that **next to the telephone you must post**:

- The name, office phone number, home phone number, and address of your emergency coordinator.
- ✓ A site plan or list of nearby:
 - Portable fire extinguishers
 - Special extinguishing equipment (e.g., foam, dry chemicals)
 - Fire alarms (only if not directly connected to fire department)

- Spill control equipment (e.g., absorbent cotton rags)
- Decontamination equipment (e.g., safety shower, eye wash fountain)
- Water at adequate volume and pressure (e.g., water hoses, automatic sprinklers, water spray systems).
- ✓ The telephone numbers of the fire and police departments.
- ✓ Although not required, it is strongly recommended that you also post the following phone numbers by the telephone:
 - State or local emergency response teams
 - Hospital
 - Local ambulance service
 - National Response Center
 - State Department of Public Safety

All employees who deal with hazardous waste must know proper waste handling and emergency procedures. You must appoint yourself or an employee to act as the emergency coordinator to ensure that emergency procedures are carried out in the event of an emergency.

The emergency coordinator (or someone designated by that person) must:

- Be available 24 hours a day either at the facility or by phone
- Know whom to call and what steps to follow in an emergency
- Commit company resources as necessary to respond to an emergency.

Because most printers are small businesses, the owner or operator probably already performs these functions. Therefore, it is not intended (nor is it likely) that you will need to hire a new employee to fill this role.

Accident Prevention. Your shop should have appropriate cleanup materials and emergency communication equipment for handling hazardous waste at your site. Some of the steps you should take to prepare for emergencies at your shop include the following:

- Make sure that there are no floor drains near the area where chemicals are used that lead to the sewer, septic tank, or storm water drain.
- ✓ Have absorbent cotton blankets or other absorbent materials in the area where hazardous materials are used or stored and keep them in a container marked "spill cleanup absorbent blankets/materials." If a spill occurs, use the cotton blankets or other absorbent materials to absorb the spill.

- ✓ Store hazardous waste in areas away from doorways. The floor in your storage area should be leak-proof (e.g., concrete with an epoxy coating). If a doorway is nearby, a concrete barrier is required to prevent the flow of material out of the door in case of a large spill.
- Provide room for emergency equipment and response teams to get into any area in your shop in the event of an emergency.
- If you are an LQG, you **must** write to local fire, police, and hospital officials or state or local emergency response teams explaining that you handle hazardous waste.
- ✓ You must install and maintain emergency equipment (e.g., an alarm, a telephone, twoway portable radios, fire extinguishers, hoses, and automatic sprinklers) at your shop in hazardous waste storage areas for flammable and combustible liquids storage, so that it is immediately available to your employees if there is an emergency. This equipment must be inspected monthly.

5.4 GOOD ENVIRONMENTAL MANAGEMENT PRACTICES

How to Select a Hazardous Waste Transporter and Waste Disposal/Treatment Facility

You should choose a transporter and waste disposal/treatment facility carefully. Even when the waste leaves your control, **your print shop remains legally responsible** for the proper disposal of your waste and any associated spills or accidents.

Before choosing a transporter or designating a facility, check with the following sources:

• Your state hazardous waste management agency or EPA regional office, which will be able to tell you whether a company has an EPA/state identification number and may know whether a company has had any problems. They may also have a list of licensed (approved) transporters.

- Your friends and colleagues in the printing business who may have used a specific hazardous waste transporter or disposal/treatment facility in the past.
- Your trade association(s), which may keep a file on companies that handle hazardous waste.
- Your Better Business Bureau or Chamber of Commerce to find out if any complaints have been registered against a transporter or facility.

After checking with these sources, contact the transporter and hazardous waste disposal/ treatment facility directly to verify that they have an EPA/state identification number and that they can and will handle your waste. In some states, the transporter and the designated facility may be required to have a special permit to operate. Make sure that the transporter and waste disposal/treatment facility have the necessary permits and insurance and that the transporter's vehicles are in good condition. You may also want to ask them:

- Where the waste is going
- · To provide information on their track record
- · If they have ever been cited for improper practices.

Checking sources and choosing a transporter and waste disposal/treatment facility may take some time. You should begin checking before you open your shop or well ahead of the time you will need to ship your waste.

Disposing of Hazardous Waste On-Site

You may **not** dispose of your hazardous waste on your property.

Manage Shop Towels Responsibly

Every printer uses shop towels of one sort or another. When shop towels are used to clean presses, they become contaminated with residual ink, blanket wash, and solvents. Used shop towels can pose a threat to human health and the environment if they are improperly managed, both in the shop and after they are sent off for disposal or laundering. Here are some guidelines that you should follow to ensure that you are handling, storing, and disposing of your shop towels in an environmentally responsible manner:

- 1. DO NOT THROW SHOP TOWELS INTO THE TRASH.
- 2. Check with your state environmental agency to determine how towels contaminated with solvents and other hazardous waste are handled in your state. Each state in New England has different requirements; you should identify your state's requirements before you take any steps.
- 3. Follow these best management practices for handling your shop towels in the shop before they are sent away for disposal or laundering:
 - Do not pour solvents on shop towels as a disposal method.
 - Collect and store shop towels in closed metal containers. Air drying contaminated shop towels may pose fire and health hazards, as well as violate hazardous waste, fire, and air regulations.



• Keep shop towel containers in a ventilated area away from other flammable materials and ignition sources. Do not store used shop towels on your dryer or electrical panel.



- Keep used shop towels away from corrosives, including haze removers, and oxidizers, such as stencil and emulsion removers that contain up to 100-percent sodium metaperiodate crystals. These substances react chemically with contaminated shop towels and can start a fire.
- 4. Determine which of the following management options for your shop towels are permissible with your state environmental agency:
 - Centrifuge or hand/mechanically wring solvents from rented or leased shop towels, collect the solvents, and then manage the towels using one of the methods listed below. By centrifuging or wringing the solvent off the towels, the solvent can be reused in-house and/or reclaimed.
 - Send rented or leased solvent-contaminated shop towels to a permitted industrial laundry or dry cleaning facility. Industrial laundry services are available that will provide you with clean shop towels and launder your soiled towels. The laundry must have the approval of its sewer utility to launder the shop towels. By using this method, you can eliminate the disposal of used shop towels as solid waste and the need for purchasing new towels.
 - Send disposable solvent-contaminated shop towels to a permitted hazardous waste disposal facility, using a licensed hazardous waste transporter.
 - If permissible by your state agency, manage towels as an industrial solid waste.
 - Send towels to an incinerator to burn for energy recovery.

Good Housekeeping

Good waste management can be thought of as simply good housekeeping practices which include:

- Using fewer hazardous materials
- Reusing materials as much as possible
- Recycling and reclaiming waste
- Reducing the amount of waste you generate.





- Do not mix nonhazardous wastes with hazardous waste (e.g., combining nonhazardous cleaning agents or rags in the same container as hazardous wastes). If you do, the nonhazardous waste may become subject to hazardous waste regulations and you will have more hazardous waste for disposal.
- Avoid mixing different hazardous waste together, unless your waste disposal facility instructs you otherwise. Doing so may make recycling very difficult, if not impossible. It may also make disposal more expensive.
- Avoid spills or leaks of hazardous products. The materials used to clean up such spills or leaks may also become hazardous wastes.
- Make sure the original containers of hazardous products are completely empty before you throw them away. Use ALL of the product -- it is good business sense. For information on how to deal with your empty containers that once held hazardous waste refer to Section 5.3.

- Avoid using more of a hazardous product than you need. For example, use no more cleaning solvent than you need to do the job.
- If you drain or wring excess solvent from shop towels, reuse it for low-quality cleaning or capture it for proper disposal.

Reducing your hazardous waste means saving money on raw materials and reducing the costs to your business for managing and disposing of your hazardous wastes.

5.5 POLLUTION PREVENTION OPPORTUNITIES FOR HAZARDOUS WASTES

This section describes pollution prevention (P2) opportunities that pertain to hazardous waste. Information on whether the technique is easy or more difficult to use is included next to each listing, followed by a description of the technique and information on its benefits. Each discussion provides information on the relative cost of the technique and the waste streams it can reduce, where possible. For more information, please contact the individuals listed in Chapter 9.

Ink Inventory Control

Easy

Technique: This pollution prevention technique will reduce ink waste generated from color changes, press cleaning, and poor ink management. Good operating practices focus on smart raw material management.

Good operating practices and process changes to reduce waste ink include the following:

- Use a standard ink sequence for process colors; schedule runs from lighter to darker colors to decrease the need to change inks and the amount of cleaning necessary.
 - Scrape as much ink as possible from the containers when disposing of or recycling ink containers.
 - Use first in first out: put new stock on shelves **behind** older stock.
 - Monitor ink inventory closely to assure that inks are used before their expiration dates. Return unused excess inks to the manufacturer if you can.
- Keep ink containers sealed and the contents labeled for future use. Plastic or waxed paper can be placed on top of the ink to prevent oxidation (skinning).
- Counsel customers about the environmental impacts associated with particular colors, paper, or printing method choices.
- Ensure that your printing jobs represent the actual cost of conducting business and disposing of hazardous waste. Factor waste disposal costs into the price of your products, and let the market do the rest.
- Improve your accuracy in job estimation. Keep track of ink waste generation by job, press, and operator.





Easv

- Consult with your supplier or use a computer mixing program with a digital scale for mixing colors. A digital scale should also be used when measuring ink to improve accuracy. You can also use software to remix and custom-formulate PMS colors.
- Benefits: Decreases the amount of waste ink generated.
- *Costs:* Process changes generally require some equipment purchases and employee training.

Material Handling and Storage

- *Technique:* This pollution prevention technique can easily be implemented at your printing shop to avoid disposing of unused or damaged materials. The material handling and storage activities that can be implemented as part of this technique include the following:
 - Material pre-inspection
 - Ordering of materials
 - Proper storage
 - · Inventory control (first in, first out)
 - · Expired materials.



Material Preinspection -- You should always inspect new materials carefully before accepting them. Unacceptable, damaged, or nearly expired materials should be returned to the supplier.

Ordering of Materials -- Minimize wastes by ordering quantities of materials that match your needs. When ordering input materials, such as film and photoprocessing chemicals, avoid overstocking by ordering according to usage demands. A good unit price is meaningless if the material goes bad on your shelf and you then have to dispose of it as hazardous waste.

Buy the largest container that allows you to use all the contents before they go bad. This minimizes solid waste from packaging.

If you operate a large printing shop, it may be appropriate to purchase raw materials in large containers, preferably in returnable or refillable totes, which will eliminate or reduce the need to clean them. If you do need to clean them, large containers take less time to clean than several small ones. And there is less waste packaging produced by one 55-gallon drum than from ten 5-gallon drums.

ľ	CAUTION	

Proper Storage -- Chemicals that are sensitive to light and temperature should be stored according to manufacturer's directions to prevent damage to the materials. Chemical container labels generally list recommended storage conditions.

Paper waste can be minimized through proper handling and storage of rolls or packages of paper. Paper can easily absorb moisture; therefore, storing paper in an area with controlled temperature and humidity is important. Ideally, sheet-fed paper should be conditioned to the temperature and humidity of the press room for 1 day before printing. Storage areas should be kept free of dust or other contaminants that could damage raw materials. These areas should not be open to traffic, which increases dust and dirt.

Easy

Inventory Control -- Chemical container labels list the shelf life for the material. You should follow these dates and keep inventories using first-in, first-out practices, which will help you reduce the amount of materials with expired shelf lives. Also, control access to materials that will become hazardous waste when spent by using a locked cabinet; these materials should not be used when a nonhazardous substitute would work as well.

Expired Materials -- Because expiration dates are estimated, you should perform smallscale tests on outdated materials prior to return or disposal to determine if they are still effective. The material may be usable, rather than becoming an expensive hazardous waste.

- *Benefits:* Cost savings from the decreased amount of raw materials discarded due to damage or expiration.
 - Less solid waste from packaging, meaning lower trash disposal costs.

Improve Press Cleaning Practices

Technique: This simple pollution prevention method includes reducing the amount of solvent applied to shop towels and the number of shop towels used to clean printing presses. Dedicating presses to specific colors or special inks will also decrease the number of cleanings required for each press. Ink fountains should be cleaned only when a different color of ink is used or when the ink might dry out between runs. Aerosol sprays are available that can be applied to the ink fountains to prevent drying overnight. This means that ink can be left in the fountain without cleaning at the end of the day.

- *Benefits:* It reduces the amount of waste ink produced and the amount of cleaning solvent and shop towels used.
 - Less labor is required to apply the spray to the ink fountains than is needed to drain and clean the fountains and dispose of the waste ink.

Recycle Used Ink

Technique: Waste inks can be recycled on-site or through an ink recycling service. Off-site recycling, either by ink manufacturers or by larger printers, may be more economical for smaller printers. The waste ink can be reformulated into black ink and sold back to the printer. Whenever possible, you should manage excess ink as if it were a manufacturing byproduct that will be reintroduced back into the printing process.

If you recycle ink at your shop, separate waste ink colors and recycle lighter colors into darker (usually black) or specialty colors. Also, store different types of ink separately. Clearly mark the containers used to collect waste ink and prevent contamination with solvents and trash.



Easy

Inks can also be sent to a fuel blending service, where they are combined with other liquids and burned in industrial boilers or kilns. The advantage of this form of disposal is that it reduces the printer's exposure to litigation and cleanup costs from improperly landfilled inks.

Benefits:

- This technique eliminates waste ink disposal costs.
 - It optimizes cost of purchased ink.

How Do I Comply With Hazardous Waste Regulations?

Aqueous Platemaking

Technique: Aqueous platemaking processes use presensitized plates that do not require the use of toxic developers. Plate quality is as good as that achieved with traditional platemakers. Aqueous chemicals must be very clean to maintain plate quality. You should always purchase the presensitized plates and aqueous developers from the same manufacturer.

Benefits:

- It reduces pollutants in wastewater.
- This technique will eliminate hazardous plate developer waste from your printing operation. By eliminating hazardous materials used in the platemaking process, you will reduce employee exposure to toxic chemicals, which increases their safety.
- If you use platemaking equipment designed to use solvent-based developers, it can also accommodate aqueous chemicals and processes.

Costs:

- A new aqueous platemaker costs from \$20,000 to \$30,000.
 - Aqueous chemical life is 15 to 20 percent shorter, and chemical changeouts must be performed more frequently than with the solvent-based chemicals. Therefore, chemical usage is higher.
 - Aqueous chemical costs will be less than the costs of solvent-based chemicals because you use less of just one chemistry. You will also realize cost savings because you will no longer be disposing of the plate- developing chemicals as hazardous waste (an approximate minimum cost of \$3.60 per gallon).

Automated Press Adjustments for Makeready

Easy/Moderate

- *Technique:* Numerous devices have been developed to automate press adjustments to speed up the makeready process. They include:
 - Web Break Detectors and Web Splicers -- A web break detector can be installed to detect tears in the web as it passes through a high-speed web press. If a tear occurs, the detector automatically shuts down the press. Electronic systems are available that detect web breaks without coming into contact with the rollers.

Splices can be made while the paper is running at operating speed or while the paper is stationary.

- **Automated Plate Benders** -- These devices were designed to prevent problems that occur when fitting a plate to a cylinder (e.g., plate cracking, unaligned plate bending along the length of the bend, and curvature of the plate varying from that of the cylinder).
- Automated Plate Scanners -- These devices were developed for lithographic web and sheet-fed offset presses using microprocessor technology. By scanning plates to determine the relative density of the printing image, ink fountain keys can be pre-set to compensate for variations in image density.
- Automated Ink Key Setting System -- Automated ink key setting is accomplished through scanning to determine ink density. Ink density information is transmitted to a computer controlled inking system so that automatic ink adjustments are made to the ink profile for each ink slide position.
- **Automated Registration Systems** -- These devices are optical scanners and microprocessors used to search for registration marks.

Easy

Ink/Water Sensors -- These devices are used to ensure that the proper ink/water ratio is being used to produce a sharp dot and strong contrast without the risk of tinting. These sensors can be a part of an automated press control system.

- *Benefits:* These devices yield increased quality control and reductions in waste paper and ink generation, as well as time.
- Costs:
- The costs of installing specific devices can be obtained from the product manufacturer. Cost savings may be realized in reductions in waste paper, ink, and plates generated.

Alternative Inks

The following alternative inks are available for use:

- Vegetable-based (including soy)
- Rubber-based (waterless printing)
- Near-zero volatile organic compound (VOC) ink/press-wash systems
- Ultraviolet-cured
- Electron-beam cured.

Moderate

- *Technique*: **Vegetable-based inks** are common substitutes for petroleum- or solvent-based inks. Soy-based inks must contain a minimum of 20 percent soybean oil. Some vegetablebased inks do not contain any petroleum products.
- Benefits:
- The use of vegetable-based inks can reduce VOC emissions by 50 to 99 percent. Vegetable-based inks typically contain less than 1 to 20 percent VOCs, whereas petroleum-based inks contain a slightly higher percent VOCs.
- Employee safety increases because worker hazards from VOC emissions are reduced or eliminated.
- Products printed with vegetable-based inks are said to be more deinkable by waste paper processors and produce less hazardous sludge, making them more recyclable than products printed with petroleum-based inks.

Costs:

- Vegetable-based inks may be harder to use, especially in high-speed or handling situations.
 - Some customers may not accept such inks because they do not yet produce very high quality results in some applications.
- They may be slightly more expensive.
- Because their quality is improving and because of the environmental advantages they offer, you should use vegetable-based inks in as many applications as possible. The fact that you use them can also be used to your marketing advantage.
- Many colored vegetable-based inks are comparable in price to petroleum- or solvent-based inks because the price is driven by the pigment and not the vehicle.

Moderate

Technique: **Rubber-based (waterless printing)** -- This pollution prevention technique describes a new development in lithography that eliminates the use of fountain solutions. In waterless printing, silicone rubber is used in place of fountain solution to repel ink from non-image areas of the printing plate.

Benefits:	 Sharper images can be created using this printing technology because inks can be applied at higher densities.
Costs:	 The inks must be maintained within narrow temperature ranges, so cooling of the printing presses is often required. Current plate-making methods for waterless printing are solvent-based, which adds to facility VOC emissions and hazardous waste.
Technique:	Moderate Near-Zero VOC Ink/Press Wash A new ink/press wash system on the market for use by lithographers contains virtually no VOCs. The ink is made from a 100-percent vegetable oil base and, through use of special chemicals, presses can be cleaned with a water-based press wash solution. Essentially, these special chemicals make the ink water soluble. To find out more about this new system, contact your state pollution prevention office or the New England Environmental Assistance Team (see Chapter 9). A technology demonstration on this innovative system showed positive results, as indicated in the following list of benefits.
Benefits:	 Reduces conventional press wash use and can reduce purchases of press wash. Eliminates hazardous solvents in wastewater discharges. Reduces hazardous waste generation and disposal. Eliminates worker health risks associated with solvents containing VOCs. Can reduce ink consumption. Business form and check printers and job shops are excellent candidates for this system. Performs well on one-color sheet fed, raised imprint, and web presses and may work on duplicators. Creates potential for green marketing of your print shop. Reduces VOC generation.
Costs:	 Blanket and roller cleanup is more time consuming but is still acceptable. There are potential drying problems. High-quality sheet fed printers must work closely with the manufacturer to perfect use for their shop. Other printers must be willing to experiment with this product and seek support from the manufacturer.
Technique:	Challenging Ultraviolet (UV)-curing inks These inks consist of liquid prepolymers and initiators. When exposed to large doses of UV radiation, these compounds immediately polymerize into a solid. As substitutes for solvent-based inks, UV-curing inks are particularly suitable for lithographic printing on nonabsorbent substrates, such as foil and plastics. Because a high capital expenditure is required to purchase the equipment, however, its use is limited to larger shops.
Technique:	Challenging Electron-beam (EB) - curing inks These inks are similar to UV-curing inks in that they contain no solvent and offer the same operational advantages. EB-curing inks are suitable substitutes for solvent-based inks used in lithographic printing. Because the cost of an EB starter system can be \$1 million or more, however, its use is limited to larger shops.

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Automatic Ink Levelers and Antiskinning Spray

- *Technique:* Automatic ink levelers work by distributing ink evenly across the ink tray and agitating the ink to prevent a skin from forming on the surface. These are most appropriate for large printing presses that are too large to spread the ink by hand. The automatic ink levelers reduce the amount of ink required to be in the ink tray to ensure distribution. Another method to prevent ink from skinning is to spray a nontoxic antiskinning agent on the ink in the tray.
- Benefits: Reductions in ink use and associated waste ink disposal.
 - Reduction in the amount of waste paper generated due to poor press runs.
- *Costs:* Some capital expenditure is required for installing the ink levelers. However, you will probably experience cost savings from reduced loss of paper and ink in poor press runs, as well as from waste ink disposal.

Reuse and Recycle Waste Solvent

Moderate

Technique:By placing drip pans under presses, solvent can be collected and reused for cleaning.
Used solvent will remove most of the ink from rollers and blankets, with only a small
amount of fresh solvent needed for final cleanup. In addition, waste solvents having one
ink color can be reused to make up the solvent content of new inks of the same color.
This pollution prevention technique will allow for a significant reduction in solvent waste
generation by reusing or recycling waste solvent.

Waste solvents can also be recycled, although they are frequently fuel-blended. Recycling waste solvents requires you to segregate used waste solvents from other hazardous wastes (e.g., waste inks, fountain solutions). These waste solvents should be handled as a hazardous waste and be recycled through a licensed off-site solvent recycler who must have an EPA identification number. These recyclers clean, regenerate, and sell used solvents as recycled solvent products.

On-site distillation units are often used to reclaim solvents. Use of a distillation unit can greatly reduce the amount of hazardous waste solvent sent off-site. (Unless you hard-pipe waste solvent directly to a recycling unit, it gets counted as a hazardous waste generated.) Note: On-site distillation of flammable liquids is VERY dangerous.

Benefits:

- By reusing waste solvents as part of your cleaning process, you significantly reduce the amount of fresh solvent needed and reduce the quantity of waste solvent that must be disposed of off-site.
- Recycling waste solvent also reduces the amount of hazardous waste incinerated or burned for energy. Both incinerators and fuel blending generate air emissions.
- Purchasing recycled solvents reduces the need for fresh solvents and promotes the solvent recycling industry.

Costs:

- There is a hazardous sludge generated that you must manage.
- Distillation units can require some capital investment, which varies greatly with the size of the unit. A continuous 110-gallon still costs about \$25,000; a 5-gallon batch costs about \$3,000.
- You must also register recycling equipment or get a state permit. (See your state's summary for more information.)

Moderate

Solvent Sink For Parts Cleaning

Moderate

- *Technique:* This pollution prevention technique can reduce your generation of hazardous solvent waste and used shop towels generated by equipment cleaning. Solvent sinks are only appropriate for your printing shop if parts from your presses can be easily removed and taken to a sink for cleaning. A solvent sink is a steel sink that parts can be placed in and cleaned with solvent. Solvent is supplied from a barrel and is recirculated. The solvent may be filtered in the sink and used until it is dirty and no longer effective. Solvent sinks are generally serviced by a company that will remove and replace ineffective solvent. Service companies typically use recycled solvents for solvent sinks. The service company must be a licensed supplier and solvent recycler.
- Benefits:
- It reduces the use of fresh solvent.
- Worker safety is improved because of reduced handling of solvent-soaked shop towels to clean press parts.
- Costs:
 Solvent sinks that are serviced by a company will cost approximately \$200 per month for a one-barrel sink that is changed monthly. Note: You should negotiate with your service-provider for less frequent solvent replacement (every 6 to 8 weeks). Service providers will want to change the solvent often, which increases your hazardous waste generation rate. Solvent sinks with filtration systems start at approximately \$700. You should compare the cost of the solvent sink with the savings associated with reducing the use of shop towels and solvents, as well as with waste ink disposal costs.

Automatic Blanket Cleaners

Challenging

- *Technique:* This pollution prevention technique can reduce your waste solvent generation. Automatic blanket cleaners, which replace hand cleanup using shop towels and solvents, have been determined to be more efficient and use less solvent than manual cleanup.
- Benefits:
- Increased employee safety because of reduced solvent handling and associated employee exposure to toxic chemicals.
- Reduced solvent use.
- Reduced waste solvent generation.
- Reduced VOC emissions.

Costs:

- By using an automatic blanket cleaner, you should realize cost savings based on decreased solvent use and labor time required for press cleaning.
 - A significant capital investment is required for an automatic blanket cleaner and other attachments.
 - A press needs to have sufficient clearance under the blanket rollers to allow for an automatic cleaner. Small presses may not have sufficient clearance.
 - It is not easy to retrofit old presses for this technology. It can also be expensive and not be a good return on investment.

·

6. How Do I COMPLY WITH AIR REGULATIONS?

As a printer, you release or emit pollutants to the air because you work with inks and solvents that contain volatile organic compounds and toxic vapors. These emissions lead to the formation of smog, and they degrade air quality. Therefore, it is important that you comply with air pollution control requirements and seek out methods for reducing air emissions from your print shop in order to protect yourself, your co-workers, and the quality of the air in New England. This chapter explains how you can meet these two objectives.

Both the U.S. Environmental Protection Agency (EPA) and state environmental agencies regulate sources of air pollution. The requirements for most printers in New England, however, will most likely be regulated at the state level. You can be held liable for failing to comply with federal AND state regulations, so it is important that you comply with all the regulations that apply to your shop. You should also know that pollution prevention is a smart management tool that will benefit you in many ways, including helping you to comply with Clean Air Act regulations.

Here are the steps you should follow to responsibly manage air emissions from your print shop:

- Determine which products you use that contain volatile organic compounds and hazardous air pollutants (defined below).
- Calculate air emissions from your shop.
- Check with your state air pollution control office and determine which regulations apply to your shop.
- Comply with all applicable regulations, including obtaining necessary permits.
- · Practice good environmental management.
- · Prevent pollution.

6.1 AIR EMISSIONS FROM PRINTING OPERATIONS

Air emissions from printing operations include *volatile organic compounds* (VOCs) and *hazardous air pollutants* (HAPs). Exhibit 2 (see

Chapter 3) lists typical air emissions generated by lithographic printing operations. While this list is not all inclusive, it provides a general idea of the kinds of air emissions that your printing operations generate.

The federal Clean Air Act is the law that regulates air pollution in the United States. It requires state environmental agencies to regulate the use of VOCs because VOC emissions lead to the formation of ground-level ozone or smog. VOCs are found in press wash, parts-cleaning solvents, proofing system solvents, fountain solutions (alcohol or its substitutes), inks, coatings, adhesives, and photo- and plate- processing solutions. Press washes can be composed of up to 100-percent organic solvents and are a major contributor to a facility's VOC emissions.

The Clean Air Act also identifies 189 chemicals that are subject to regulation as HAPs. Section 6.3 presents a list of federally regulated HAPs. The state in which you operate may also regulate additional chemicals as HAPs. (Please see your state's requirements provided in a pocket at the end of this manual). On the federal HAP list, the most common chemicals used by lithographers are certain glycol ethers, which can be found in alcohol substitutes and cleaning solutions.

After you identify which products used at your shop contain VOCs and/or HAPs, you must determine the quantity of emissions generated from the use of these products and the best way to manage these emissions. Section 6.2 explains how to calculate your emissions. Section 6.3 explains the requirements you must follow to address emissions from VOCs and HAPs. Section 6.4 explains the permitting regulations. Sections 6.5 and 6.6 offer information on good environmental management and pollution prevention opportunities that can improve the efficiency of your printing operations. The pocket at the end of this manual contains a summary of your state's requirements.

6.2 CALCULATING AIR EMISSIONS FROM YOUR PRINT SHOP

You will need to calculate the *actual* amount of VOCs and HAPs generated by your facility, as well as your facility's *potential to emit* these pollutants. Under the Clean Air Act, your facility's potential to emit VOCs and HAPs is important in determining which regulatory requirements apply to your facility.

A facility's *potential to emit* is defined as the greatest amount of emissions that could be released by all the equipment in the facility if it was operated 24 hours a day, 365 days a year (its "maximum design capacity"). Pollution control devices that reduce emissions and restrictions on the hours of operation are not included in the calculation of a facility's potential to emit unless you have a federally enforceable permit that includes these conditions (see Section 6.4).

You need to perform the following calculations to determine your facility's actual and potential VOC and HAP emissions in order to determine which regulations apply to your facility.

A. Determining Your Shop's Actual VOC or HAP Emissions

The material balance method is suggested for determining your actual air emissions. The basic concept underlying the material balance method is that the amount of material entering a process (like printing) is equal to the amount exiting the process. Therefore, what you purchase as raw material must become part of the finished product, be emitted to the air or water, be disposed of as waste, or be accumulated in inventory.

You must have the following information to use the material balance method to calculate emissions:

- Beginning of the month inventory
- New purchases
- End of the month inventory
- Quantity shipped (i.e., manifested) off-site

Density or specific gravity of the material
Percentage of VOCs and HAPs in the material.

Material Safety Data Sheets (MSDSs) generally provide the density or specific gravity of the material. MSDSs also give the percentage of VOCs or HAPs in the material (usually stated on a weight basis). If any of this information is not available on the MSDSs, you should contact your vendor to obtain the necessary data. Exhibit 10 illustrates the necessary steps to calculate your actual VOC or HAP emissions.

B. Determining Your Facility's Potential VOC or HAP Emissions

Once you have determined your shop's actual annual emissions, you should use this information to determine your shop's potential to emit VOCs or HAPs. As previously mentioned, a facility's potential to emit is based on its maximum design capacity (all equipment in the shop operating 24 hours per day, 365 days per year, or a total of 8,760 hours per year). Also, pollution control devices that reduce emissions and restrictions on the hours of operation are not included in the calculation, unless you have a federally enforceable permit that includes these limits. So, you should compare your facility's actual hours of operation to the maximum design capacity of 8,760 hours per year, using this formula:

Potential emissions (lbs/year) = Actual emissions x (8,760 \div Actual hours of operation).

Exhibit 10. Calculating Your Actual VOC or HAP Emissions

- Step 1: Determine which products you purchased that contain VOCs or HAPs, using your Material Safety Data Sheets.
- Step 2: Determine the weight of each VOC- or HAP-containing product used in pounds.
- Step 3: For each VOC- or HAP-containing product, subtract the amount of material that your records show was disposed of or that remains in your shop.
- Step 4: Multiply the number from Step 3 by the VOC or HAP content of each product (usually as a percentage) as listed on the MSDS.
- Step 5: Add together the results from Step 4 for each VOC- or HAP-containing product used. The number that results is your facility's total actual VOC or HAP emissions.

Please keep in mind that your potential to emit must account for emissions that **could have** come from any unused equipment that may not have been included in determining the facility's actual emissions. For example, a printer may own four presses but only have operated three during the past year. Emissions from three of the presses would be used to determine the facility's actual emissions. But calculation of potential emissions must include emissions from all four presses.

In addition, according to EPA guidance, calculations of your facility's maximum production capacity should include the use of coatings and inks with the highest VOC content used in practice at your shop during the previous 2 years. Finally, if you can document inherent physical design limitations (e.g., your individual emissions units require consistent and necessary maintenance), you should contact your state to determine whether you can reduce the number of hours you must use in calculating your potential to emit. Exhibit 11 provides an example of how to determine your facility's actual and potential VOC emissions using a hypothetical print shop.

Exhibit 11. Calculating Actual and Potential VOC Emissions at Ace Printing
(Note: This is a hypothetical example. The amounts assumed below will vary at your shop.)
Step 1: Determine which products were purchased that contain VOCs:
Bob, the owner of Ace Printing, operates three presses. He uses the following amounts of product in one year (VOC content and other parameters were obtained from suppliers and Material Safety Data Sheets):
 Ink 40,000 lbs (VOC content of 20% by weight) Alcohol 3,000 gallons (density of 6 pounds per gallon, VOC content of 100%) Press Wash 3,000 gallons (VOC content of 75%; specific gravity [sg] of 0.9).
Note: Make sure to include in your calculation all VOC-containing materials that you use, including adhesives; solvents used in parts cleaners; and proofing system solutions.
Step 2: Determine the weight in pounds of each product used:
 Ink = 40,000 lbs Alcohol = 3,000 gallons x 6 lbs/gallon = 18,000 lbs Press Wash = 3,000 gallons x (0.9 sg^a x 8.34 lbs/gallon) = 22,500 lbs
^a Note: Specific gravity (sg) is the density of a compound as compared to water (8.34 pounds/gallon). To calculate the density from a given specific gravity, multiply the specific gravity by 8.34 pounds per gallon.
Step 3: Subtract the amount of material disposed of, or remaining, that can be accounted for:
 Ink Assume that 1,000 lbs of ink are disposed of in waste shipments. Total ink used = 40,000 lbs - 1,000 lbs = 39,000 lbs. Alcohol All alcohol is used in the operation. Total alcohol used = 18,000 lbs. Press Wash Assume that 1,000 lbs are disposed of in shop towels. This number may be estimated by weighing shop towels dry and then again before laundry pickup. Total press wash used = 22,500 lbs - 1,000 lbs = 21,500 lbs.



6.3 DETERMINING WHICH REGULATIONS APPLY TO YOUR FACILITY

Once you have calculated your facility's actual and potential emissions, you are ready to determine which state and federal regulations may apply to your facility.

A. Major VOC Sources

A facility may be classified as a *major source of VOC emissions* depending upon its potential to emit VOCs and its location. Areas that experience unhealthy ground-level ozone (i.e., smog) concentrations more than once per year on average are designated as *non-attainment areas*. These areas are then classified as

marginal, moderate, serious, severe, or extreme, depending upon the severity of the air quality problem.

In most of New England, which is part of a special area known as the *Northeast Ozone Transport Region*, a *major source* is one with the potential to emit 50 tons (100,000 pounds) of VOCs or more per year. However, for facilities located *in the southwestern portion of Connecticut*, a *major source* is one with the potential to emit 25 tons (50,000 pounds) of VOCs or more per year, because this area has severe ground level ozone problems.

- If your shop is a major source of VOCs, based on its potential to emit, you must follow the requirements listed below.
- If your shop is **not** a major source of VOCs, skip to Section B (Major HAP Sources).

REQUIREMENTS FOR MAJOR VOC SOURCES:

You must reduce your emissions through the use of Reasonably Available Control Technology. In some cases, states have established their own control levels. EPA issued a draft Control Techniques Guideline document outlining recommended levels of control for the offset lithographic printing industry in September 1993. EPA also issued an Alternative Control Techniques document in June 1994 that contains supplemental information. These documents may be obtained from state and federal environmental agencies. In these two EPA guidance documents for offset lithographic printing shops, the recommended levels of control are as follows:

- Heatset web -- The fountain solution must contain no greater than 1.6-percent alcohol by weight or no greater than 3.0percent alcohol by weight if the solution is refrigerated to less than 60° F. If, however, the fountain solution contains no alcohol, it may contain up to 5.0-percent VOCs by weight. Also, VOC emissions from the press dryer exhaust vent must be reduced by 90 percent (by weight), or a maximum dryer outlet concentration of 20 ppmv must be maintained, whichever is less stringent.
- Non-heatset web -- The fountain solution must contain no alcohol.
- Sheet-fed -- The fountain solution must contain no greater than 5.0percent alcohol by weight or no greater than 8.5-percent alcohol by weight if the solution is refrigerated to below 60^o F. Alternatively, if the fountain solution contains no alcohol, the fountain solution may contain up to 5.0-percent VOCs by weight.

• Cleaning solutions -- You must use cleaning solutions with a VOC content of 30 percent or less or cleaning solutions with a VOC composite partial vapor pressure less than 10 mm Hg at 20^o C.

These are the EPA **recommended** levels of control. Check with your state to see whether their requirements are more stringent and whether a state license is needed. In addition, if you are a major VOC source, you need to obtain a Title V operating permit. Section 6.4 discusses operating permits.

B. MAJOR HAP SOURCES

If your print shop has the potential to emit 10 tons per year (20,000 pounds) of any single HAP on the federal HAP list (see Exhibit 12) or 25 tons per year (50,000 pounds) of any combination of HAPs on the federal HAP list, it is considered a **major source of HAPs** and will need to obtain a Title V operating permit.

Your state may regulate other pollutants in addition to those on the federal HAPs list. Refer to your state's requirements provided in the pocket at the end of this manual.

- ✓ If your shop is a major source of HAPs, you must obtain a Title V operating permit. See Section 6.4 for details, and
- ✓ You should also review the requirements in Section C, New Sources or Modifications.

Exhibit 12. List of Federal Hazardous Air Pollutants (HAPs)		
Sec. 112 (b) List of Pollutants (1) Initial List The Congress establishes for purposes of this section a list of hazardous air pollutants as follows:		
CAS Number	Chemical Name	
75070	Acetaldehyde	
60355	Acetamide	
75058	Acetonitrile	
98862	Acetophenone	
53963	2-Acetylaminofluorene	
107028	Acrolein	
79061	Acrylamide	
79107	Acrylic acid	
107131	Acrylonitrile	
107051	Allyl chloride	
92671	4-Aminobiphenyl	
62533	Aniline	
90040	o-Anisidine	
1332214	Asbestos	
71432	Benzene (including benzene from gasoline)	
92875	Benzidine	
98077	Benzotrichloride	
100447	Benzyl chloride	
92524	Biphenyl	
117817	Bis(2-ethylhexyl)phthalate (DEHP)	
542881	Bis(chloromethyl)ether	
75252	Bromoform	
106990	1,3-Butadiene	
156627	Calcium cyanamide	
105602		
133062	Captan	
63252	Carbaryl	
75150	Carbon disulfide	
56235	Carbon tetrachloride	
463581	Carbonyl sulfide	
120809	Catechol	
133904	Chloramben	
57749	Chlordane	
//82505	Chlorine	
79118	Chloroacetic acid	
532274	2-Chloroacetophenone	
108907	Chlorobenzene	
510156	Chlorobenzilate	
67663	Chlorotorm	
107302	Chloromethyl methyl ether	
126998	Chloroprene	
1319773	Cresols/Cresylic acid (isomers and mixture)	
95487	o-Cresol	
Exhibit 12. List of Federal Hazardous Air Pollutants (HAPs) (continued)		
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CAS Number	Chemical Name	
108394	m-Cresol	
106445	p-Cresol	
98828	Cumene	
94757	2,4-D, salts and esters	
3547044	DDE	
334883	Diazomethane	
132649	Dibenzofurans	
96128	1,2-Dibromo-3-chloropropane	
84742	Dibutylphthalate	
106467	1,4-Dichlorobenzene(p)	
91941	3,3-Dichlorobenzidene	
111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)	
542756	1,3-Dichloropropene	
62737	Dichlorvos	
111422	Diethanolamine	
121697	N.N-Diethyl aniline (N.N-Dimethylaniline)	
64675	Diethyl sulfate	
119904	3.3-Dimethoxybenzidine	
60117	Dimethyl aminoazobenzene	
119937	3 3'-Dimethyl benzidine	
79447	Dimethyl carbamoyl chloride	
68122	Dimethyl formamide	
57147	1.1-Dimethyl hydrazine	
131113	Dimethyl phthalate	
77781	Dimethyl sulfate	
534521	4 6-Dinitro-o-cresol and salts	
51285	2 4-Dinitrophenol	
121142	2 4-Dinitrotoluene	
123911	1 4-Dioxane (1 4-Diethyleneoxide)	
122667	1 2-Dinhenvlhydrazine	
106898	Enichlorohydrin (1-Chloro-2 3-enoxypronane)	
106887	1 2-Enoxybutane	
140885	Ethyl acrylate	
100414	Ethyl bonzene	
51706	Ethyl carbamato (Lirothane)	
75002	Ethyl chlorida (Chloroethane)	
10003	Ethylong dibromide (Dibromoethang)	
100904	Ethylene dibloride (1.2 Disbloreethane)	
107002		
10/211	Ethylene glycol Ethylene imine (Aziridine)	
151564	Ethylene imine (Aziriaine)	
/5218		
96457	Ethylene thiourea	
75343	Ethylidene dichloride (1,1-Dichloroethane)	
50000	Formaldehyde	
76448	Heptachlor	

CAS Number	Chemical Name
118741	Hexachlorobenzene
87683	Hexachlorobutadiene
77474	Hexachlorocyclopentadiene
67721	Hexachloroethane
822060	Hexamethylene-1,6-diisocyanate
680319	Hexamethylphosphoramide
110543	Hexane
302012	Hydrazine
7647010	Hydrochloric acid
7664393	Hydrogen fluoride (Hydrofluoric acid)
7783064	Hydrogen sulfide
123319	Hydroquinone
78591	Isophorone
58899	Lindane (all isomers)
108316	Maleic anhydride
67561	Methanol
72435	Methovychlor
7/839	Methyl bromide (Bromomethane)
74873	Methyl chloride (Chloromethane)
74075	Methyl chloroform (1, 1, 1, Trichloroethane)
79033	Methyl othyl ketene (2 Butanene)
60244	Methyl bydrazino
74004	Methyl Indide (ledemethane)
100404	Methyl iodide (lodomethalle)
100101 604990	Methyl isobulyl kelone (nexone)
024009	Methyl isocyaliale Methyl methoanilata
00020	Methyl methacrylate
1034044	Methyl tert bulyr ether
101144	4,4-Methylene bis(2-chloroaniline)
75092	Methylene chloride (Dichloromethane)
101688	Methylene olphenyl dilsocyanate (MDI)
101779	4,4'-Methylenedianiline
91203	Naphthalene
98953	Nitrobenzene
92933	4-Nitrobiphenyl
100027	4-Nitrophenol
79469	2-Nitropropane
684935	N-Nitroso-N-methylurea
62759	N-Nitrosodimethylamine
59892	N-Nitrosomorpholine
56382	Parathion
82688	Pentachloronitrobenzene (Quintobenzene)
87865	Pentachlorophenol
108952	Phenol
106503	p-Phenylenediamine
75445	Phosaene
7803512	Phosphine
7702140	Phoenhorue

Exhibit 12. List of Federal Hazardous Air Pollutants (HAPs) (continued)			
CAS Numbe	er <u>Chemical Name</u>		
CAS Number 85449 1336363 1120714 57578 123386 114261 78875 75569 75558 91225 106514 100425 96093 1746016 79345 127184 7550450 108883 95807 584849 95534 8001352 120821 79005 79016 95954 88062 121448 1582098 540841 108054 593602 75014 75354 1330207	erCnemical NamePhthalic anhydria Polychlorinated I 1,3-Propane sult beta-Propiolacto Propionaldehyda Propoxur (Baygo Propylene dichlo Propylene oxide 1,2-Propylenimir Quinoline Quinone Styrene Styrene oxide 2,3,7,8-Tetrachlo 1,1,2,2-Tetrachlo Titanium tetrachl Toluene 2,4-Toluene diar 2,4-Toluene diar 2,4-Toluene diar 2,4-Toluene diar 2,4-S-Trichloropt Trichloroethyle Trichloropt Trichloropt Trichloropt Trichloropt Trifluralin 2,2,4-Trimethylp Vinyl acetate Vinyl bromide Vinyl chloride Vinylidene chlorid Xylenes (isomers)	de piphenyls (Arochlors) one ne n) ride (1,2-Dichloropropane) de (2-Methyl aziridine) prodibenzo-p-dioxin proethane ene (Perchloroethylene) oride nine pocyanate rinated camphene) inzene hane hane han	
95476 108383	o-xylenes m-Xylenes		

Exhibit 12. List of Federal Hazardous Air Pollutants (HAPs) (continued)		
CAS Number	Chemical Name	
106423	p-Xylenes	
0	Antimony Compounds	
0	Arsenic Compounds (inorganic including arsine)	
0	Beryllium Compounds	
0	Cadmium Compounds	
0	Chromium Compounds	
0	Cobalt Compounds	
0	Coke Oven Emissions	
0	Cyanide Compounds ¹	
0	Glycol ethers ²	
0	Lead Compounds	
0	Manganese Compounds	
0	Mercury Compounds	
0	Fine mineral fibers ³	
0	Nickel Compounds	
0	Polycyclic Organic Matter⁴	
0	Radionuclides (including radon) ⁵	
0	Selenium Compounds	

Note: For all listings above which contain the word 'compounds' and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the name chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.

C. NEW SOURCES OR MODIFICATIONS

Your shop is subject to the Clean Air Act *new* source review requirements if you are either a *new major source* or an *existing major source* with significant modifications to equipment at your shop.

New source review requires you to control your emissions to the greatest extent technically possible. In non-attainment areas and in the Ozone Transport Region, all *new major sources* are required to offset their emissions. Each state's regulations define when a shop would be considered a "new" source (see your state's regulations provided in the pocket at the end of this manual). An *emissions offset* is the

¹ X'CN where X=H' or any other group where a formal dissociation may occur. For example KCN or Ca(CN)₂.

² Includes mono- and di-ethers or ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH₂CH₂) n-OR' where n=1, 2, or 3; R=alkyl or aryl groups; R'=R, H, or groups which, when removed, yield glycol ethers with the structure: R-(OCH₂CH)n-OH. Polymers are excluded from the glycol category.

³ Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.

⁴ Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100°C.

⁵ A type of atom which spontaneously undergoes radioactive decay.

reduction of emissions at an existing source to compensate for new emissions at another source. You can offset new emissions by buying or trading emissions reductions from other sources. If you are a new major source of VOC emissions, you will definitely be subject to new source review. If you are a new source whose emissions are less than major, you may still be subject to minor new source review depending on your state. Most minor new source review programs do not require offsets, but do require the source to implement the best available control technology.

Because you may be more likely to modify your existing facility rather than build a new one, you should understand the regulatory implications of modifying your plant. You will be subject to new source review if you undertake a significant modification to an existing major source. A *modification to an existing major source* (e.g., adding a press) is considered significant if it causes emissions at your facility to exceed:

- 40 tons per year of VOCs in Maine, Vermont, and portions of New Hampshire
- 25 tons per year of VOCs in Connecticut, Rhode Island, Massachusetts, and other portions of New Hampshire.

Further, each state has a federally approved program to regulate minor modifications and minor new sources (see your state's regulations provided in a pocket at the end of this manual).

- ✓ If your new shop is a major or minor new source or if you undertake a significant modification to an existing source, your state environmental agency will determine the specific control measures you must implement. Contact the office listed on your state summary page provided in the pocket at the end of this manual.
- ✓ You should also review the requirements in Section 6.4, Air Pollution Permits.

6.4 AIR POLLUTION PERMITS

Air permits serve three roles. They:

• Provide an inventory of air pollution sources. This inventory is used by federal, state, and local agencies to plan for either further reductions of air pollution or the maintenance of current air quality.

- Designate the control requirements to be used to reduce the emissions of certain pollutants at a facility.
- Identify how a facility demonstrates compliance with the control requirements.

Permits can take several forms, including a *permit-to-construct* and a *permit-to-operate*. A *construction permit* may be required before any new facility can be built or before any new piece of equipment (e.g., a printing press) can be installed or modified (see your state summary page provided in a pocket at the end of this manual). An *operating permit* will contain all applicable and enforceable control requirements and, like all permits, will have a defined period of effectiveness.

One type of operating permit, mandated by the 1990 Clean Air Act Amendments, is the *Title V operating permit*. The *Title V operating permit* specifies all of the state and federal control requirements, emission limits, and recordkeeping, monitoring and reporting requirements to which your facility is subject.

Your facility will need to obtain a Title V operating permit if it is a major source of HAPs or a major source of VOCs, based on your facility's potential to emit these pollutants (see Sections 6.3A and 6.3B).

In some states (e.g., New Hampshire, Massachusetts, Rhode Island, and Maine), if you are a major source based on your potential emissions but your actual emissions are much less than your source levels, you can obtain a *permit to restrict* your emissions below the major source threshold and you will not be required to obtain a Title V operating permit or comply with major new source requirements (see your state summary provided in the pocket at the end of this manual).

6.5 GOOD Environmental Management Practices

Here are some tips on good environmental management practices that could help you save money and improve your operations:

- Document all actions you take to reduce or eliminate emissions.
- Keep good records of product purchases and use so you can accurately calculate your emissions.
- Do appropriate reporting and keep important records of waste disposal.
- Document your actual and potential VOC and HAP emissions calculations as well as your operating time.
- Educate your customers on the environmental impacts of their product choices.
- Conserve and reuse inks.
- Handle solvents carefully to minimize spills.
- Avoid use of products containing VOCs and chlorinated solvents (e.g., benzene, 1,1,1-trichloroethylene, methylene chloride, toluene, and xylene).
- Choose solvents with a low VOC content or low vapor pressure or that are water-miscible when possible.
- Reuse shop towels for low quality cleaning needs in the shop prior to proper disposal.
- Use solvents conservatively by using plunger cans to dispense solvents with meters and using only the amount necessary. Appoint one person to store and distribute solvents.
- Do not leave shop towels out in the open; use a metal container with a lid that can be closed using a foot pedal.
- Do not leave product containers open.
- Switch to alcohol-free fountain solution -- today.

6.6 POLLUTION PREVENTION OPPORTUNITIES FOR AIR EMISSIONS

If you are subject to any of the requirements outlined in Sections 6.2 through 6.4, you should use pollution prevention techniques as a means of both complying with regulations and reducing your regulatory burden. Even if you are not subject to any of the above requirements, you should prevent pollution where possible in your facility because it can save you money on solvents and reduce worker exposure to chemicals so that your facility provides a safer and more pleasant work environment.





This section describes pollution prevention (P2) opportunities that can limit air emissions. Information on whether the technique is easy or more difficult to use is included next to each listing, followed by a description of the technique and its benefits. Each discussion provides information on the relative cost of the technique and the waste streams that can be reduced using each technique, where possible. For more information, please contact the individuals listed in Chapter 9.

Cover Photoprocessing Chemical Containers

Technique: This is a simple P2 technique that can be implemented at your shop to:

- Reduce or eliminate air emissions generated by chemical evaporation
- Reduce purchases of virgin photoprocessing chemicals.

Developers evaporate very quickly, while fixers evaporate at a slightly slower rate. The containers should always be sealed or covered to prevent evaporation. Many print shops use floating lids, caps, or other devices to do this. You should also cover trays overnight if tray processing is done.

- *Benefits:* Your photoprocessing costs are reduced because there is minimal loss of the product through evaporation.
 - Your working environment will be safer because of the reduction and/or elimination of air emissions from the solutions.
- *Costs:* This technique may require you to purchase covers and lids. Special tanks/containers can be purchased for \$20 to \$250.

Alternative Fountain Solution

Technique:	The use of alternative fountain solution will reduce or eliminate your facility's VOC emissions. Fountain solutions traditionally contain isopropyl alcohol (IPA). Non-IPA fountain solutions that use glycol ether are typically used as a replacement for IPA.
Benefits:	 Substitutes may help you meet VOC emission limits for your printing shop. Since substitutes are used at much lower concentrations, you will incur cost savings by using less product. Substitutes will improve the indoor air quality of your shop because VOC emissions will be significantly reduced or eliminated. Substitutes eliminate the use of highly flammable, dangerous products.
Costs:	 Non-IPA fountain solutions cost approximately \$18 to \$20 per gallon, while IPA solutions cost around \$10 per gallon. Non-IPA fountain solutions perform differently on the press than IPA solutions. Generally, their operating range is smaller, and the viscosity can vary with temperature resulting in inconsistent wetting.

Alternative Cleaning Solutions

How Do I Comply With Air Regulations?

Technique: The use of alternative blanket washes and cleaners that are less toxic and flammable will reduce your facility's VOC emissions. Typical press-cleaning solutions contain aliphatic

Moderate

Easy/Moderate

Easy

and aromatic hydrocarbons. Alternative blanket washes, which contain mixtures of glycol ethers and other heavier hydrocarbons, have higher flashpoints and low toxicities, which are formulated to produce lower VOC emissions. These glycol ether solutions clean comparably to conventional solvents.

These alternative cleaning solutions do not evaporate as rapidly as other solvents and may require a substantially longer drying time. Because of the environmental and safety benefits of these materials, however, they are gaining in popularity. Cleanup should be done with detergents or soap solutions wherever possible. Solvents should be used only for cleaning up inks and oils.

Water miscible solvents are another alternative worth exploring. They contain 100percent VOCs when purchased, but are cut to 50 percent with water, so at press contain only 50 percent VOCs by content.

- *Benefits:* The benefit of using lower VOC solvents is the reduced VOC emissions, which improves indoor and regional air quality.
- Costs:
 Many alternative cleaning solutions require a substantially longer drying time.
 Extra time is required for cleaning presses.

Water-Based Adhesives for Postpress Operations

- *Technique:* Water-based adhesives have long been used in printing shop operations in addition to using solvent-based adhesives. However, an important trend in postpress operations is the increasing use of water-based adhesives in place of solvent-based adhesives, which contain toluene and methyl ethyl ketone, two highly toxic chemicals.
- Benefits:
 Reduces VOC and HAP emissions from solvent-based adhesives.
 Reduces worker exposure to hazards.

Reduce Fountain Solution Temperature

Technique: This P2 technique is a good operating practice that will minimize waste paper and ink generated from poor press runs, as well as significantly reduce VOC emissions. Whether you use IPA or non-IPA fountain solution, you can maximize the efficiency of the fountain solutions by maintaining them at their optimum operating temperature through cooling or refrigeration. The optimum temperature may vary for different solutions.

Refrigeration units can be installed for large presses. The smallest press that can typically accommodate a refrigeration unit is a 26-inch one-color press.

- *Benefits:* A refrigeration unit with a filtration system can significantly extend the life of non-IPA fountain solutions by removing ink and paper particles. Fountain solution life may be extended to months instead of days.
 - Reduced fountain solution losses.
 - Increased employee safety by reduced exposure to VOC emissions.



Moderate/Challenging

Moderate

Costs:

٠

They do not work well in open fountains.

A fairly significant capital expenditure is required for the refrigeration unit and the replumbing. A 5-gallon refrigeration unit costs approximately \$2,400, and the plumbing can cost approximately \$1,000.

7. How Should I Handle Solid Waste?

Businesses across the United States generate extremely large amounts of nonhazardous waste daily. In New England, incinerators and, most often, landfills are the final destination for most of this waste. But many avenues exist for diverting waste from a trash disposal facility that may be in your community.

Solid waste reduction lowers energy consumption and the emission of greenhouse gases. Recycling programs take materials out of the waste stream that can be remanufactured into new products, creating new businesses and putting people to work. Industrial waste exchanges turn one company's trash into another company's raw materials.

This chapter describes some solid waste reduction and recycling opportunities for lithographers. But because lithographic processes differ from one shop to next, you will be the best source of solid waste reduction ideas for your shop. To begin, start with the ideas listed in Section 7.1, and then contact the resources listed in Section 7.2.

7.1 REDUCTION AND RECYCLING OPPORTUNITIES FOR SOLID WASTE

Inefficiently managed solid waste can lead to excessive and unnecessary expenses for your company. The following list provides several suggestions and resources to help you better handle your company's solid waste.

- Reduce materials used -- You can use conservatively or eliminate completely a number of input materials to reduce solid wastes generated by your printing operations. These materials include coatings that hinder recycling of paper from your shop and paper.
- Reuse materials -- While reducing the input materials to your printing process is the most effective means of pollution prevention, reusing materials in your printing operations can be an equally effective way of reducing

your solid waste stream. Try using returnable materials containers and returnable plastic or wood pallets. Check with your suppliers for other suggestions on how you can reuse materials that end up in your trash bin.

• Recycle scrap -- Many materials in a print shop can be recycled, preventing them from ending up in the local landfill. They include packaging, paper (from test runs, scrap, waste, outdated), empty containers,

cardboard, pallets, outdated materials (chemicals), plates, film (used or spoiled), and lubricating oils. Consult your vendors or local recycling firms for more ideas.



In addition, the use of **in-line finishing** is a worthwhile pollution prevention technique to reduce solid waste. Finishing operations have historically been labor-intensive operations, handled either in-house or by a trade shop, and were not integrated with the presses. Today, equipment is available to perform almost all major postpress operations, including cutting, folding, perforating, trimming, and stitching inline. Web presses are often linked directly to computer controlled in-line finishing equipment.

New to in-line finishing is demographic binding, which is the selective assembly of a publication based on a number of factors, such as geographic area, family structure, income, or personal interests. For example, a printer can select an advertisement to appear only in those copies of a magazine intended for distribution in the advertiser's selling area. Demographic binding has proven to be a successful marketing tool, especially for major magazines.

This pollution prevention technique reduces costs by reducing the number of operators and workers required for off-line finishing operations by almost half, while sometimes doubling or tripling the rate of production. It can also be used to prepare materials for mailing by using computers. These computers can store and provide address labels, as well as address each publication in zip code order.

7.2 New England State Solid Waste Programs

This section provides contact numbers and information on New England solid waste programs.

WasteCAP

WasteCAPs are independent not-for-profit organizations located in Maine, Massachusetts, and New Hampshire that assist and encourage companies to effectively drive costs out of their operations through improved production and solid waste management practices. WasteCAPs conduct free, confidential, on-site waste assessments; provide technical assistance over the phone; and publish quarterly newsletters to support solid waste reduction. WasteCAPs can also assist clients in designing or improving recycling programs and establishing effective materials procurement practices. This section lists WasteCAP contacts for the New England states.

CONNECTICUT

Administering Agency

Connecticut Department of Environmental Protection 79 Elm Street Hartford, CT 06106-5127

Waste Management Bureau Solid Waste: (860) 424-3021 Office of Pollution Prevention: (860) 424-3297

Waste Planning and Standards Bureau Source Reduction and Recycling: (860) 424-3365

MAINE

Administering Agency

Maine Department of Environmental Protection State House Station 17 Augusta, ME 04333

Hazardous Materials and Solid Waste Control Bureau Solid Waste: (207) 289-2651 State Planning Office State House Station 38 Augusta, ME 04333 Recycling: (207) 287-5649

WasteCAP of Maine Maine Chamber and Business Alliance 120 Exchange Street Portland, ME 04112 (207) 774-1001

MASSACHUSETTS

Administering Agency

Massachusetts Department of Environmental Protection One Winter Street Boston, MA 02108

Division of Solid Waste Management, Bureau of Waste Prevention Solid Waste: (617) 292-5960 Recycling: (617) 556-1021

WasteCAP of Massachusetts, Inc. P.O. Box 763 222 Berkeley Street Boston, MA 02117-07763 (617) 236-7715

NEW HAMPSHIRE

Administering Agency

New Hampshire Department of Environmental Services 6 Hazen Drive Concord, NH 03301

Waste Management Division Solid Waste: (603) 271-2900 Recycling: (603) 271-3712

WasteCAP of New Hampshire 122 North Main Street Concord, NH 03301 (603) 224-5388

RHODE ISLAND

Administering Agency

Rhode Island Department of Environmental Management 235 Promenade Street Providence, RI 02908

Office of Waste Management/Site Remediation Solid Waste: (401) 277-2797

Office of Strategic Planning and Policy Recycling: (401) 277-3434

VERMONT

Administering Agency

Vermont Department of Environmental Conservation 103 South Main Street Waterbury, VT 05671

Waste Management Division Solid Waste: (802) 241-3888

Environmental Assistance Division Recycling: (802) 241-3589

8. How Do I Respond to Spills and Plan for Emergencies?

If there is a chemical or oil spill at your print shop, you may be subject to many regulatory requirements, depending on what spilled, how much spilled, and where it was spilled. It is critical that you contain chemical and oil spills immediately and report them to the appropriate authorities in a timely manner. Failure to respond to spills appropriately could have dire consequences for the environment in which you and your employees live and work. The consequences of not reporting a release when it is required may be guite costly. And for the sake of your community and its natural resources, you should also comply with any additional chemical reporting and emergency planning requirements that may apply to your shop. It is just plain good business sense.

Chapter 5 of this manual discusses **spills of hazardous waste** covered by the Resource Conservation and Recovery Act (RCRA) and the associated planning requirements. If you have developed a contingency plan and have followed the procedures in place at your shop to address RCRA chemical spills, you will have satisfied the emergency planning and response requirements for RCRA hazardous waste. Similarly, Chapter 4 discusses reporting requirements appropriate to **releases of RCRA hazardous and nonhazardous waste to sewers and septic systems**.

Three other major laws, however, set out how you should:

- Report spills of chemicals other than RCRA hazardous waste
- · Report some chemicals used in your shop
- · Plan for chemical emergencies and oil spills.

The laws are the Emergency Planning and Community Right-to-Know Act (EPCRA), which includes planning, reporting, and chemical spill requirements; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund law), which includes requirements concerning spills of certain chemicals; and the Oil Pollution Act, which details oil spill planning and response requirements. The major requirements imposed by these laws are described below.

8.1 EMERGENCY SPILL REPORTING

Two major laws may affect you if a chemical is spilled in your shop. The first is CERCLA which authorizes the U.S. Environmental Protection Agency (EPA) to respond to releases of hazardous substances that may endanger public health or the environment. The second is Subtitle III of the Superfund law Amendments, known as EPCRA.

If you spill a CERCLA hazardous substance or an EPCRA extremely hazardous substance in an amount equal to or in excess of the reportable quantities, your printing shop must **immediately** notify:



- The National Response Center at (800) 424-8802
- Your State Emergency Contact -- See the contact list below
- Your Local Emergency Planning Committee (LEPC) -- This information is available from your SERC.

You must also provide a written report on actions taken and on any medical effects of the release to these same organizations.

There is no penalty for making these phone calls but there is a penalty for **not** making the calls. So, do yourself a favor and make the calls if you have any doubt about your requirements in the event of a spill at your print shop.

The <u>Title III List of Lists</u> provides the list of CERCLA *hazardous substances* or EPCRA *extremely hazardous substances* and the *reportable quantities*. You can obtain the List of Lists by contacting the EPCRA Hotline at (800) 535-0202, the RCRA/Superfund Hotline at (800) 424-9346, or the EPA Chemical Emergency Preparedness and Prevention Office at http://www.epa.gov/swercepp/.

New England State Emergency Contacts

CONNECTICUT

Administering Agency

Oil & Chemical Response Division Connecticut Department of Environmental Protection 79 Elm Street - 4th Floor Hartford, CT 06106

- Oil & Chemical Emergency Response: (860) 424-3338
- General Information: (860) 424-3231

MAINE

Administering Agency

Division of Response Services Maine Department of Environmental Protection State House Station 17 Augusta, ME 04333

- Oil & Chemical Emergency Response (during business hours): (800) 482-0777
- Oil & Chemical Emergency Response (during non-business hours): (207) 657-3030
- General Information: (207) 287-7190

MASSACHUSETTS

Administering Agency

Bureau of Waste Site Cleanup Massachusetts Department of Environmental Protection 1 Winter Street - 5th Floor Boston, MA 02108

- Oil & Chemical Emergency Response (during business hours):
- Northeast Region (Woburn) (617) 932-7600
- Southeast Region (Lakeville) (508) 946-2850
- Central Region (Worcester) (508) 792-7653
- Western Region (Springfield) (413) 784-1100

- Oil & Chemical Emergency Response (during non-business hours): (508) 820-2121
- General Information: (617) 292-5801

NEW HAMPSHIRE

Administering Agency

New Hampshire Department of Environmental Services P.O. Box 95 Concord, NH 03302

- Oil & Chemical Emergency Response (during business hours): (603) 271-3899
- Oil & Chemical Emergency Response (during non-business hours): (800) 346-4009
- General Information: (603) 271-3503

RHODE ISLAND

Administering Agency

Rhode Island Department of Environmental Management 235 Promenade Street Providence, RI 02905

- Oil & Chemical Emergency Response (during business hours): (401) 277-3872
- Oil & Chemical Emergency Response (during non-business hours): (800) 498-1336
- General Information: (401) 277-2234

VERMONT

Administering Agency

Hazardous Materials Management Division Vermont Department of Environmental Conservation Waterbury State Complex 103 South Main Street Waterbury, VT 05676

- Oil & Chemical Emergency Response: (800) 641-5005
- Waste Management Division: (802) 241-3888

8.2 EMERGENCY PLANNING AND CHEMICAL REPORTING

EPCRA is the environmental law that sets out the primary planning and reporting requirements for chemicals that you may use in your shop. The purpose of EPCRA is two-fold:

- To encourage and support emergency planning, by industry in coordination with state and local governments, for responding to chemical accidents
- To provide local governments and the public with information about possible chemical hazards in their community.

There are civil and criminal penalties for failure to meet these obligations, and there is a citizen suit provision of this law, so do not be caught unaware!

It is important to note that if you eliminate EPCRA chemicals from your operations through pollution prevention, you will also eliminate the associated planning and notification requirements for your print shop. This is an excellent opportunity to decrease your shop's regulatory burden through pollution prevention.

A. Emergency Planning

- ✓ All facilities, no matter how small, that use extremely hazardous substances listed under EPCRA in excess of certain amounts (called threshold planning quantities) must participate in emergency planning. The information submitted through these emergency plans is used to help local governments respond to spills or releases and is made available to the public.
- These same facilities must also appoint a facility emergency coordinator who must participate in the local emergency planning process.
- ✓ Your first step to determine if these requirements apply to your shop is to determine if you use chemicals regulated under EPCRA and, if so, to determine what amounts are present at your shop. The list of EPCRA chemicals and their *threshold*

planning quantities is provided in the <u>Title III</u> <u>List of Lists</u> and is available by contacting the EPCRA Hotline at (800) 535-0202, the RCRA/Superfund Hotline at (800) 424-9346, or the EPA Chemical Emergency Preparedness and Prevention Office at http://www.epa.gov/swercepp. The EPCRA hotline can also answer questions you may have concerning how EPCRA may apply to your print shop.

B. Hazardous Chemical Reporting

✓ You must submit or prepare copies of your print shop's Material Safety Data Sheets (MSDSs) or lists of all hazardous chemicals present at your print shop above threshold quantities, regardless of location or use, to the SERC, the LEPC, and local fire department.

The threshold quantities are:

- 500 pounds and less for *extremely* hazardous substances
- 10,000 pounds and more for *hazardous chemicals*.

MSDSs are available from your vendors. This reporting requirement is based on the Occupational Safety and Health Administration's (OSHA) definition of a *hazardous chemical*, which is essentially any chemical that poses physical or health hazards. As many as 500,000 products can fit this definition; therefore, it is highly likely that this reporting requirement applies to your shop.

✓ You must also submit annual inventories of these same hazardous chemicals to the same three organizations -- the LEPC, the SERC, and the local fire department. These inventories are due on March 1 of each year. Although one of two forms can be used (Tier I or Tier II), most states use Tier II forms for reporting. Tier II forms ask for the amounts and general location of specific chemicals. Some states have their own form and may allow electronic reporting (contact your state office listed below).

C. The Toxics Release Inventory and Form R Reporting

EPCRA also establishes reporting requirements for facilities that store and manage specified chemicals. Facilities who must comply include those that:

- Are classified in Standard Industrial Classification (SIC) codes 20 through 39 (Manufacturing), which includes printers, and which meet the following criteria:
 - · Have 10 or more full-time employees; and
 - Manufacture or process 25,000 pounds or more of specified chemicals or use quantities exceeding 10,000 pounds of specified chemicals.

Facilities that meet these criteria must:

✓ Submit a Form R report on yearly toxic chemical releases to their states and EPA. That is, covered facilities must estimate each year the total amount of the listed chemicals they release into the environment (either accidentally or as a result of routine manufacturing operations) or transport as a waste to another location. The reports are due on July 1 of each year for releases in the previous calendar year.

EPA uses this information to establish a national Toxic Chemical Release Inventory and makes the information available to the public and communities through a computerized database called the Toxic Release Inventory (TRI) database. This form is available from your state EPCRA contact (see the next section). Electronic reporting is also available.

New England State EPCRA Contacts and Requirements

The following sections summarize the New England state EPCRA requirements applicable to print shops that are **more stringent and/or different than** the federal requirements. The sections also list state EPCRA contacts.

CONNECTICUT

Administering Agency

State Emergency Response Commission Connecticut Department of Environmental Protection 79 Elm Street - 4th Floor Hartford, CT 06106-5127 (860) 424-3373

Connecticut uses the standard federal Tier II form for reporting and requires the submission of facility floor plans as part of its reporting specifications. You have the option to file electronically. Connecticut requires reporting of **any** chemical spill (liquid, gaseous, and solid) to the Department of Environmental Protection, Oil and Chemical Response Division at (860) 424-3338. Connecticut also requires manufacturers that use, keep, store, or produce any hazardous material to file a report with the local fire marshall. Contact your local fire department for details on these reports.

MAINE

Administering Agency

State Emergency Response Commission Maine Emergency Management Agency State House Station 72 Augusta, ME 04333 (207) 287-4080

Maine uses a state-specific Tier II form for reporting and has additional state-specific facility planning requirements. A reporting fee is calculated based on the size of the facility and the amount of chemicals being reported.

MASSACHUSETTS

Administering Agency

State Emergency Response Commission Massachusetts Emergency Management Agency 400 Worcester Road Framingham, MA 01701 (508) 820-2000 William Panos Massachusetts Department of Environmental Protection Bureau of Waste Prevention 1 Winter Street Boston, MA 02108 (617) 292-5870

Massachusetts uses a standard Tier II form with the option of filing electronically.

NEW HAMPSHIRE

Administering Agency

State Emergency Response Commission Governor's Office of Emergency Management State Office Park South 107 Pleasant Street Concord, NH 03301 (603) 271-2231

New Hampshire uses a standard Tier II form for reporting and requires that MSDSs be submitted annually.

RHODE ISLAND

Administering Agency

State Emergency Response Commission Rhode Island Emergency Management Agency 645 New London Avenue Cranston, RI 02920 (401) 946-9996

Martha Delaney Mulcahey Rhode Island Department of Environmental Management Division of Air Resources 235 Promenade Street Providence, RI 02908-5767 Attn: Toxic Release Inventory (401) 277-2808

Rhode Island has state-specific facility planning requirements, and the Tier II reporting must be submitted electronically.

VERMONT

Administering Agency

State Emergency Response Commission Vermont Emergency Management Agency 103 South Main Street Waterbury, VT 05676 (802) 244-8721 (800) 347-0488

Gary Gulka Vermont Department of Environmental Conservation Waste Prevention Section 103 S. Main St. Westbury, VT 05671-0411 (802) 241-3626

Vermont uses a standard Tier II form for reporting with a reporting fee based on the size of the facility and the amount of chemicals being reported.

8.3 OIL SPILL PREVENTION CONTROL AND COUNTERMEASURES

The Oil Pollution Act contains requirements that may apply to your shop in two ways:

• Any spill of oil large enough to cause a sheen in a body of water must be reported to the National Response Center at (800) 424-8802 and to the appropriate state oil and chemical emergency response number identified in the Section 8.1.

These spills include releases to floor drains or storm drains, as well as chronic leaks from equipment or oil storage tanks.

 If you have a single above ground heating oil storage tank on your property that holds more than 660 gallons of oil or any number of tanks that hold more than 1,320 gallons of oil, you must have a Spill Prevention Control and Countermeasures (SPCC) Plan. Rhode Island has an Oil Pollution Control Regulation governing the storage of oil. For information on this program, call (401) 277-3872.

New Hampshire has a Control of above ground Petroleum Storage Facilities rule pending. For information on the rule, call (603) 271-3644.

8.4 ONE PLAN

The Integrated Contingency Plan Guidance (discussed in Chapter 5) allows you to consolidate multiple emergency response plans into **one** functional **emergency response plan**. This option could save you a great deal of time and effort. To find out more about One Plan, contact the EPCRA Hotline at (800) 535-0202, the RCRA/Superfund Hotline at (800) 424-9346, or the EPA Chemical Emergency Preparedness and Prevention Office at http://www.epa.gov/swercepp.

9. RESOURCES

This section presents a list of state and federal contacts that you can call if you are seeking additional information on a particular issue or regulation. Remember that state contacts for wastewater, hazardous waste, and air emissions are provided in the pocket at the end of this manual.



9.1 CONNECTICUT

State Pollution Prevention and Regulatory Assistance Contacts

Mary Sherwin Pollution Prevention Coordinator CT Department of Environmental Protection 79 Elm Street Hartford, CT 06106-5127 (860) 424-3297 Internet Address: www.state.ct.us P2 Clearinghouse & On-Site Technical Assistance: Robert Brown ConnTAP 50 Columbia Boulevard., 4th Floor Hartford, CT 06106 (860) 241-0777

Office of Pollution Prevention

1-800-789-9801

State Small Business Contact

Tracy Babbidge Small Business Ombudsman CT Department of Environmental Protection 79 Elm Street Hartford, CT 06106-5127 (860) 424-3382

9.2 MAINE

State Pollution Prevention and Regulatory Assistance Contacts

Ann Pistell OR Technical Assistance Coordinator ME Department of Environmental Protection State House Station 17 Augusta, ME 04333 (207) 287-7881 Internet Address: www.state.me.us/dep/mdephome.htm

State Small Business Contact

Brian Kavannah Small Business Technical Assistance Coordinator ME Department of Environmental Protection State House Station 17 Augusta, ME 04333 (207) 287-6188 In Maine: (800) 789-9802

9.3 MASSACHUSETTS

State Pollution Prevention and Regulatory Assistance Contacts

George Frantz Special Projects MA Office of Technical Assistance 100 Cambridge Street, Room 2109 Boston, MA 02202 (617) 727-3260 ext. 631

P2 Clearinghouse: Toxics Use Reduction Institute University of Massachusetts - Lowell One University Avenue Lowell, MA 01854 (508) 934-3275 Massachusetts Printers Partnership: Nancy Wrenn MA Department of Environmental Protection Bureau of Waste Prevention One Winter Street Boston, MA 02108 (617) 292-5584

Internet Address: www.magnet.state.ma.us/dep/dephome.htm

State Small Business Contact

George Frantz Small Business Ombudsman MA Office of Technical Assistance 100 Cambridge Street, Room 2109 Boston, MA 02202 (617) 727-3260, ext. 631

9.4 New Hampshire

State Pollution Prevention and Regulatory Assistance Contacts

Vince Perelli Pollution Prevention Program Manager NH Department of Environmental Services 6 Hazen Drive Concord, NH 03301-6509 (603) 271-6460 Internet Address: www.state.nh.us P2 Clearinghouse: Kathy Blake NH Department of Environmental Services 6 Hazen Drive Concord, NH 03301-6509 (603) 271-2902

State Small Business Contact

Rudy Cartier, Jr., P.E. Small Business Technical Assistance Program & Ombudsman NH Department of Environmental Services 64 North Main Street Concord, NH 03301-6509 (603) 271-1379 (800) 837-0656 (in-state)

9.5 RHODE ISLAND

State Pollution Prevention and Regulatory Assistance Contacts

Richard Enander Pollution Prevention Program Manager RI Department of Environmental Protection 235 Promenade Street Providence, RI 02908 (401) 277-3434, ext. 4411 Internet Address: www.state.ri.us/pg1txt.htm

State Small Business Contact

Richard Girasole RI Department of Environmental Protection RI Pollution Prevention Program, Small Business Contact 235 Promenade Street Providence, RI 02908 (401) 277-3434, ext. 4414

9.6 VERMONT

State Pollution Prevention and Regulatory Assistance Contacts

Gary Gulka Waste Prevention Section Chief VT Department of Environmental Conservation 103 South Main Street Waterbury, VT 05671-0404 (802) 241-3626 Internet Address: www.state.vt.us/anr

On-Site Assistance Program

David Boyer Retired Engineers and Professionals (REAP) P.O. Box 422 Randolph, VT 05060 (802) 728-1423 or (800) 363-REAP

State Small Business Contact

Kevin Bracey Small Business Ombudsman VT Department of Environmental Conservation Air Pollution Control Division 103 South Main Street Building 3 South Waterbury, VT 05671-0402 (802) 241-3841

9.7 FEDERAL RESOURCES IN NEW ENGLAND

EPA Regional Lithographic Printing Contacts

Sally Mansur New England Environmental Assistance Team U.S. Environmental Protection Agency, Region 1 JFK Federal Building (SPN) Boston, MA 02203 (617) 565-1378 e-mail: mansur.sally@epamail.epa.gov

EPA Pollution Prevention and Regulatory Assistance Contacts

Anne Leiby New England Environmental Assistance Team U.S. Environmental Protection Agency, Region 1 JFK Federal Building (SPN) Boston, MA 02203 (617) 565-4974

e-mail: leiby.anne@epamail.epa.gov

New England Environmental Assistance Team (NEEATeam) U.S. Environmental Protection Agency, Region 1 JFK Federal Building Boston, MA 02203 (800) 90-NEEAT Internet Address: www.epa.gov/region01

- **Research Library** -- EPA Region I employs a full-time research librarian who can assist you with questions concerning solid waste. To reach the regional research librarian, call (617) 565-3282.
- **WasteWise** -- WasteWise is an EPA program that promotes voluntary waste reduction through prevention, recycling, and the purchase of recycled goods. Companies that commit to a waste reduction receive technical assistance in achieving their waste reduction goals. For more information on the WasteWise program or other solid waste or recycling issues, call (800) 372-9473.
- **Tips Hotline** -- EPA Region I operates a centralized environmental tip and complaint hotline for use by the general public. The number is (888) EPA-TIPS.
- Small Business Ombudsman -- Our Small Business Ombudsman is Dwight Peavey, who can be reached at (617) 565-3230.
- Environmental Leadership Program -- The Environmental Leadership Program is for companies that have a demonstrated commitment to compliance and pollution prevention. Participants agree to a one year project to test innovative approaches to environmental protection. Call (617) 860-4ELP for information.
- Project XL (Excellence in Leadership) -- Project XL encourages tests of innovative strategies that achieve cleaner and cheaper environmental results than traditional regulatory approaches. Call Anne Kelley at (617) 565-3426.
- Energy Conservation -- EPA runs the Green Lights program for companies that want to reduce their lighting expenses (sometimes by half) by upgrading lighting without compromising quality. Call Norman Willard at (617) 565-3702.

9.8 OSHA

The Occupational Safety and Health Act (OSHA) imposes a wide variety of important requirements on industry, including lithographic printers. A discussion of these requirements is beyond the scope of this manual. Because the costs of non-compliance with OSHA regulations can be quite significant, you should ensure compliance with OSHA regulations, just as you should with environmental regulations. This section lists the OSHA contacts in the New England states.

State OSHA Contacts

Connecticut

James P. Butler Commissioner Connecticut Department of Labor 200 Folly Brook Boulevard Wethersfield, CT 06109 (806) 566-5123

Maine

Alan C. Hinsey Director Maine Bureau of Labor Standards State House State #82 Augusta, ME 04333 (207) 624-6400

Massachusetts

Christine Morris Secretary Executive Office of Labor MA Department of Labor and Industries 1 Ashburton Place, Room 2112 Boston, MA 02108 (617) 727-6573

New Hampshire

Charles E. Danielson, M.D., MPH Director NH Department of Health and Human Services 6 Hazen Drive Concord, NH 03301-6527 (603) 271-4501 Samuel Moore 7(c)(1) Project Manager Connecticut Department of Labor 200 Folly Brook Boulevard Wethersfield, CT 06109 (806) 566-4550

Lester Wood 7(c)(1) Project Manager Maine Bureau of Labor Standards Division of Industrial Safety State House State #82 Augusta, ME 04333 (207) 624-6460

Joseph LaMalva 7(c)(1) Project Manager Commonwealth of Massachusetts MA Department of Labor and Industries 1001 Watertown Street West Newton, MA 02165 (617) 727-3982

Stephen Beyer 7(c)(1) Project Manager NH Department of Health Division of Public Health Services 6 Hazen Drive Concord, NH 03301-6527 (903) 271-2024

Rhode Island

Patricia A. Nolan, M.D., MPH Director RI Department of Health 3 Capital Hill Providence, RI 02908 (401) 277-2231

Vermont

Mary S. Hooper Commissioner Vermont Department of Labor and Industry 120 State Street Montpelier, VT 05602 (802) 828-2288 Marie Stoeckel 7(c)(1) Project Manager RI Department of Health Division of Occupational Health 3 Capital Hill, Room 206 Providence, RI 02908 (401) 277-2438

Robert McLeod 7(c)(1) Project Manager Vermont Department of Labor and Industry National Life Building, Drawer #20 Montpelier, VT 05602 (802) 828-2765

9.9 OTHER SOURCES

Regional Resources

Northeast Waste Management Officials' Association (NEWMOA) 129 Portland Street, Suite 601 Boston, MA 02114 (617) 367-8558

NEWMOA offers:

- Regional list servers for printers
- CD-ROM information on P2 for printers
- P2 clearinghouse
- State referrals.

Northeast Business Environmental Network (NBEN) 56 Island Street P.O. Box 806 Lawrence, MA 01842 (508) 557-5475 Internet Address: www.nben.org

NBEN offers:

- Value-added networking
- Non-political atmosphere
- Online research librarian
- Partnering opportunities
- A forum for best management practices.

PRINTING-RELATED HOME PAGE SITES ON THE INTERNET

• **Printers' National Environmental Assistance Center (PNEAC)** -- The PNEAC is jointly sponsored by the Illinois Hazardous Waste Research and Information Center (HWRIC), the University of Wisconsin's Solid & Hazardous Waste Education Center (SHWEC), the Graphic Arts Technical Foundation (GATF), and Printing Industries of America (PIA). The goal of the Center is to provide information about the environmental impacts of printing, and effective means to achieve compliance with environmental regulations.

Internet Address: www.inhs.uiuc.edu/pneac/pneac.html

GATF Home Page -- The Graphic Arts Technical Foundation (GATF) home page provides information about GATF membership, workshops, products, services, NSTF scholarships, etc.

Internet Address: www.gatf.lm.com

• **PIA Home Page** -- The Printing Industries of America (PIA) home page provides information about PIA membership and a search feature to locate local PIA members.

Internet Address: www.printing.org

• **PINE Home Page** -- Printing Industries of New England (PINE) offers Environmental, Safety and Health visits to your shop, at no cost, to assist in your understanding and compliance with federal and state regulations. The PINE homepage provides information about membership and other services.

Internet Address: www.pine.org

• **NAPL Home Page** -- The National Association of Printers and Lithographers (NAPL) home page describes NAPL, lists NAPL resources, equipment vendors and manufacturers, etc.

Internet Address: www.napl.org/napl/home.html

• Envirosense: Printing P2 -- This home page contains case studies, pollution prevention practices, regulations, and vendor information of interest to printers.

Internet Address: www.seattle.battelle.org/es-guide/print/print.htm

• U.S. Screen Printing Institute (SPI) -- This home page lists SPI products, services, industry suppliers, etc.

Internet Address: www.usscreen.com

 Craftnet Web Site -- The International Association of Printing House Craftsmen home page describes the Craftsmen's clubs, seminars, etc.

Internet Address: craftnet.eas.asu.edu/welcome.html

VIDEO RESOURCES

- Green and Profitable National Videoconference -- A 2-hour video of the May 17, 1996, national videoconference explaining compliance requirements and waste prevention and pollution prevention techniques for lithographic printers.
- Green and Profitable Printing Video Training Series -- Four video modules that explore practical waste reduction strategies for small and medium lithographic printers. The fee for this series and accompanying viewer notes is \$35, prepaid.

Both videos can be obtained from the University of Wisconsin Extension. Contact:

Marilyn McDole University of Wisconsin-Extension Solid & Hazardous Waste Education Center 610 Langdon Street, Room 529 Madison, WI 53703 (608) 262- 0910

MASSACHUSETTS

As part of a pilot program called the Massachusetts Printers Partnership, Massachusetts has developed a workbook which explains environmental requirements and pollution prevention opportunities applicable to commercial printers.



Massachusetts plans to incorporate the workbook standards into regulations in mid-1997. The workbook, as well as the information regarding regulatory developments, is available at: http://www.magnet.state.ma.us/dep.

For more information call:

Nancy Wrenn Bureau of Waste Prevention Massachusetts Department of Environmental Protection (617) 292-5587