

THE EVOLUTION OF PRINTING

A PRINTER'S GUIDE TO...

VERMONT'S ENVIRONMENTAL REGULATIONS

CONVENTIONAL OFFSET COLOR PRINTING



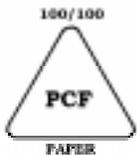
CONVENTIONAL OFFSET COLOR PRINTING WITH DIGITAL PRE-PRESS



DIGITAL OFFSET COLOR PRINTING



Vermont Agency of Natural Resources
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FALL 1997



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INTRODUCTION

This environmental compliance assistance Guide provides a step-by-step self audit checklist and guide to compliance with VT Department of Environmental Conservation's (DEC) laws and regulations on air pollution, waste water disposal and solid and hazardous waste. It is intended primarily for non-heatset web and sheet-fed lithographers and screen printers.

The Guide has been developed with the small business in mind. We have tried to make it clear and concise, but with enough detail so that many or most of your questions will be answered. However, if you do have questions, please call us and we will get the answers for you. You may also request a non-regulatory, on-site compliance assistance visit by our compliance engineer by calling this number:

ENVIRONMENTAL ASSISTANCE HOTLINE

1-800-974-9559

THE ENVIRONMENTAL ASSISTANCE DIVISION

The Environmental Assistance Division is a non-regulatory Division within the Department of Environmental Conservation. The Division houses a Small Business Compliance Assistance Program as well as a pollution prevention technical assistance program. Services available include: phone assistance on compliance issues and pollution prevention, on-site assistance (such as compliance assistance visits and waste prevention opportunity assessments), workshops, seminars, written materials and information and research on pollution prevention technologies. All services are provided at no cost and information resulting from these services is not made available to regulatory divisions within the Department.

HOW TO USE THE GUIDE

This Guide is divided into two sections. The first is a self audit checklist that covers the environmental regulations that may apply to your commercial printing operation. To keep this Guide simple and user friendly, we have not included regulatory citations for the various environmental regulations. These question sets apply to air pollution, wastewater discharge and solid and hazardous waste regulations. You are given a choice of responses to questions or statements (yes, no or NA for not applicable). If you answer yes or NA, you are likely to be in compliance with the specific requirement. ***If your answer is no, it is likely that you might have a problem if inspected.*** If you are not sure whether a particular practice or activity meets the regulations, please contact the Environmental Assistance Hotline. You may want to copy the sheets so that you can conduct periodic self audits, or you can ask us for an electronic version of the checklist that you can maintain in a computer file for your use. The Appendix section of the guide contains additional materials (worksheets, fact sheets, sample forms and resource lists) you may find useful.

The Guide also includes useful Pollution Prevention (P2) and Best Management Practice (BMP) Tips. The Tips are shown under the audit checklist question to which they relate. ***Remember that pollution prevention or waste prevention techniques will make environmental compliance easier and less costly. By preventing, eliminating or minimizing waste at the source, you can reduce or eliminate certain regulatory requirements.*** Typical pollution prevention methods fall into the categories of input substitution of less toxic materials, equipment and process modification, and improved operations and maintenance, including employee training. With a comprehensive pollution prevention program in place, most printers will find environmental compliance to be an easier goal to obtain.

Look to the following resources for help in completing the checklist:

- ▣ Purchase and/or material usage records for the year,
- ▣ Material inventories for the current year,
- ▣ Material safety data sheets for all products you use,
- ▣ Hazardous waste shipment manifests,
- ▣ Currently held state or local permits, such as discharge permits.

TEN TIPS FOR ENVIRONMENTAL SUCCESS

#1 LEARN ABOUT POLLUTION PREVENTION

The less waste you generate in the first place, the less there is to be regulated and the easier your job will be to maintain compliance. You will also save money, improve health in the workplace and contribute to environmental protection. Switching to low VOC inks, cleanup and fountain solutions is a good way to prevent pollution. Call the Environmental Assistance Division at 800-974-9559 for information and assistance.

#2 DON'T THROW IT IN THE DUMPSTER

Hazardous substances should never be handled like regular trash. They are often toxic; some can be recycled. Look for ways to recycle scrap film, corrugated cardboard, paper and other solid waste streams. Contact your local Solid Waste Management District for information and assistance or call the Recycling Hotline at 800-932-7100.

#3 DON'T RELY ON SHOP TOWELS

Shop towels can be too easily overused. You should remove excess ink with a scraper or spatula before wiping with a shop towel. Save as much ink as you can by putting it back into its regular container. Don't use shop towel containers to dispose of waste ink or solvents. If you minimize the amount of solvent and inks on rags, you can ship them to a laundry service instead of having to manage them as a hazardous waste. They may be exempt from all environmental regulatory requirements in this way.

#4 AVOID TOXIC SOLVENTS LIKE THE FOLLOWING, ASK YOUR VENDOR FOR ALTERNATIVES

ethyl benzene
xylene
MEK (methyl ethyl ketone)

perchloroethylene
trichloroethane
MIK (methyl isobutyl ketone)
methylene chloride

toluene
methanol
trichloroethylene

#5 FIX YOUR FIXER

Untreated spent fixer must not be put down the drain because it exceeds hazardous waste and local sewer discharge limits for silver. You have several options: you can take your fixer to another business that has silver recovery equipment, do your own silver recovery on-site with silver recovery equipment, or use an off-site collection service. If you decide to reclaim on-site, use a two-stage silver recovery system and change the cartridges regularly.

#6 BE AWARE OF FIRE HAZARDS

Don't store solvents or used shop towels near dryers or other ignition sources. Keep used towels in closed containers. Enforce an appropriate no smoking policy. Ground your containers of flammable liquids or solids when dispensing or adding materials. Sign up for and take advantage of the VOSHA consultation and training service to assist you in maintaining a safe workplace by calling 800-287-2765.

#7 LABEL WASTE CONTAINERS AND PUT THEM IN ONE SPOT

Nothing can get you into trouble faster than sloppy, disorganized waste storage. Choose one area in the shop to put all your wastes. Be sure to separate your waste storage area from your product storage area. Label each of your waste containers similar to the following examples: Waste Ink Only, Press Wash Only, Waste Oil Only, Used Shop Towels Only, Used Fixer Only, and Scrap Film Only.

#8 LEARN HOW TO READ MATERIAL SAFETY DATA SHEETS (MSDS)

Material Safety Data Sheets are documents that come with most chemical products you buy. They give you key environmental, health, and work place safety information. Reading an MSDS before making a purchase could help you avoid problems down the road.

#9 KEEP GOOD RECORDS

Keep every receipt, bill of lading, land disposal restriction form, or manifest every time you buy materials or dispose of your waste. Good records, kept in an easily accessible file by year, will help you keep better track of material use and waste management. Good record keeping can expedite a property sale or loan, and help prove that any site contamination problems that may be found later were not created by you.

#10 ASK FOR HELP

As burdensome as environmental regulations may seem, they were created to protect you and your workers, and they're here to stay. So stay ahead of the game. Don't be afraid to use technical resources available to you (see Appendix G). We're here to help you understand and comply with the regulations and look for waste prevention opportunities. When you have completed the self audit checklist and still have questions, take the next step and call us!

HAZARDOUS WASTES

Hazardous wastes include many toxic, ignitable and corrosive wastes that are generated through industrial processes. As a printing business it is important to know:

Does my business generate hazardous waste? If so, what types?

How much hazardous waste does my business generate each month ?

Am I a *Conditionally Exempt Generator (CEG)*?

As my business grows, what can I do to remain a *CEG*?

A Conditionally Exempt Generator (CEG) produces less than 220 pounds per month of hazardous waste. This is approximately 27 gallons or ½ of a 55 gallon drum per month of hazardous waste. Regulatory requirements for CEGs are minimal. Most printers should be able to qualify as CEGs.

Help is available from a variety of sources (see Appendix G) to help you understand hazardous waste management requirements and to reduce waste generation. A “*Conditionally Exempt Generator Handbook*“ is also available to supplement the information in this Guide.

The checklist below will help you to comply with all CEG requirements. *If you generate more than 220 lbs. per month, you are a regulated generator and will need to contact the Waste Management Division (WMD) to learn of additional requirements affecting your business.* They can provide you with an excellent resource: the “*Hazardous Waste Generator Handbook*”.

SELF AUDIT CHECKLIST - HAZARDOUS WASTE

1. We have determined which of our wastes are hazardous and which are not.

Yes No

HINT:

The hazardous waste codes given in the table on the following page are those that are typically used to identify/describe the wastestream on: a hazardous waste label, a hazardous waste manifest form and on the “Notification of Regulated Waste Activity” form. (See Appendix A for more information on waste codes.)

P2 TIP:

Use Material Safety Data Sheets (MSDS) to pre-screen new products being considered for use. They can provide key environmental, health and work place safety information. Reading an MSDS before making a purchase can help you avoid problems down the road.

2. We have calculated our monthly waste generation and have determined we are a Conditionally Exempt Generator (CEG) of less than 220 lbs./mo. of hazardous waste, or that we are a fully regulated generator of more than this amount.

Yes No

3. We have filed a notification of Hazardous Waste Activity Form with the Waste Management Division (WMD).

Yes No

HINT:

All generators of hazardous waste are required to file a "Notification of Regulated Waste Activity" form with the Waste Management Division (WMD). Upon receipt of the form the WMD will assign the facility an EPA Identification Number. A temporary ID number can be assigned if wastes need to be shipped before a permanent number can be obtained. See Appendix G for a copy of the notification form and instructions on how to complete it.

P2 TIP:

Use products with fewer or no hazardous ingredients. Read product Material Safety Data Sheets and talk to your vendors about non-hazardous product alternatives.

GENERIC WASTESTREAM	TYPICAL WASTE CODE	LIKELY HAZARDOUS PROPERTIES
Photographic fixer (solutions or silver laden recovery media).	D011	Silver residues in excess of 5 mg/l. Note: Silver separated from fixer in flake form, on-site, using electrolytic recovery equipment is exempt as a "precious metal".
Lithographic & most screen inks.	VT02*	Petroleum content >5% by weight, some colored inks may also be hazardous for metals.
Blanket/roller wash, screen reclamation.	D001**	Ignitable (i.e. flashpoint ,140 °F).
Lubricating/gearbox oil.	VT02	Petroleum (currently exempt only if re-refined). Under proposed regulations, would also be exempt if burned on-site or off-site for energy recovery.
Parts cleaning solvent.	VT02, D001**	Often ignitable, typically petroleum based.
Oil soaked absorbent materials.	VT02	Petroleum content >5% by weight.
Solvent-based adhesive.	D001	Ignitable.

*Some inks may contain heavy metal pigments which would require that an additional waste code be used (i.e. inks containing lead would also be coded D008) see Appendix A for more information about waste codes.

**Some of these products contain certain solvents which would require the use of an additional waste codes (i.e. if the product contains > 10% xylene it would also be coded F003) see Appendix A for more information about waste codes.

4. We ship hazardous wastes to certified treatment, storage or disposal facilities (TSDF) using licensed hazardous waste transporters and hazardous waste manifest (A list of certified transporters can be obtained from the WMD).

Yes No N/A

HINT:

All Vermont solid waste landfills prohibit knowing acceptance of any hazardous waste for disposal in the landfill. CEGs may opt to self-transport (up to 55 gallons at any one time) to a certified TSDF, to a municipal CEG hazardous waste collection site or to a generator facility under the same ownership. If self-transporting, U.S. Department of Transportation hazardous materials placarding requirements may apply.

5. As a CEG, we do not accumulate more than 2,200 pounds of hazardous waste at any one time.

Yes No N/A

HINT:

A word of CAUTION !!! If you ever accumulate more than 2,200 pounds at one time (roughly 5 - 55 gallon drums) you are subject to full regulation as a generator.

6. Hazardous wastes are stored in containers which are in good condition and which are compatible with the wastes being stored.

Yes No N/A

HINT:

Corrosive liquids such as waste fixer should be stored in plastic containers and flammable liquids, like waste solvent, must be stored in metal containers.

BMP:

Labeling waste containers and segregating waste streams cuts unwanted mixing of wastes; it makes recycling easier and may lower disposal costs.

BMP:

Periodically inspect waste containers for leaks.

BMP:

Hazardous waste should not be stored outside where freezing can occur.

7. We keep containers holding hazardous waste closed except when it is necessary to add or remove waste.

Yes No N/A

HINT:

A drum-mounted funnel must be covered for the container to be considered closed.

BMP:

Wastes should be stored under cover and on an impervious surface; do not store wastes near floor drains.

BMP:

Keeping containers covered assures employees breathe less solvent vapors and your facility emits fewer VOCs.

8. We have a parts cleaner which uses solvents and keep it covered when it is not in use.

Yes No N/A

P2 TIP:

Evaluate aqueous cleaning agents or less hazardous/volatile solvents.

9. Containers holding ignitable wastes (those with a flash point of <140 degrees F) are stored at least 50 feet from the property line.

Yes No N/A

BMP:

Store hazardous wastes in a discrete location so you can keep better track of them.

10. We do not discard waste press wash, fountain solution or liquid waste ink in the trash.

Yes No N/A

P2 Tip:

Try ink conservation/reuse strategies like:

- use ink levelers at fountains
- *use computerized ink mixing*
- keep ink cans covered
- *try similar job scheduling to minimize need to change ink in fountains*
- use soy-based or other low or non-petroleum-based inks when feasible
- *evaluate software programs that allows custom mixing in desired amounts*
- label and store PMS inks for special order colors for future reuse
- *evaluate opportunities to reuse and recycle inks wherever possible*
- designate one person to control ink inventory and use
- *change ink fountains only when ink is linty/dirty instead of on regular schedule*
- use ink fountain covers
- *use spray ink preservatives*
- reuse waste inks as house colors

11. We do not place waste ink cans in the trash until we have removed enough ink residue for the cans to be called “empty”.

Yes No N/A

HINT:

To qualify for the “empty container” exemption in the hazardous waste regulations, the amount of hazardous residue in the container must be: less than 1” or no more than 3% by weight of the total capacity of the container if the container has a volume of 110 gallons or less. If the container is larger than 110 gallons, it can contain no more than 0.3% by weight of the total capacity of the container.

BMP:

Use an ink knife or spatula to get ink cans as empty as possible. This might allow them to be recycled by a scrap metal dealer.

12. We manage our wipers or rags in accordance with policies contained in the Fact Sheet entitled “Laundering Hazardous Waste-Contaminated Reusable Absorbents” (see Appendix C) or we manage the used rags as a hazardous waste.

Yes No N/A

HINT:

Rags laundered in accordance with the above policy are exempt as a hazardous waste. Two key provisions of that policy are that (1) rags be stored in a closed container so as not to release pollutants to the environment; and (2) free liquid is not present on the rags. As long as one drop of solvent can flow from a wiper, the wiper is saturated, and therefore considered hazardous. Wipers may be wrung out by hand or by some other mechanical compaction method, using proper personal protection equipment and procedures for handling ignitable liquids. It is not recommended that ignitable solvents be recovered from wipers without explosion-proof equipment.

BMP:

Used rags should immediately be placed in foot-operated, self-closing, VOSHA approved metal containers after use.

13. We do not dump waste press wash into containers of used wipers or rags.

Yes

No

N/A

P2 TIP:

Cleaning up right after a job is done is easier and requires less solvent.

P2 TIP:

Plunger cans or other metering devices will result in less solvent being used for clean-up operations while minimizing spills and reducing evaporation.

WASTEWATER DISCHARGES

DISCHARGES TO MUNICIPAL SEWER SYSTEMS

Hazardous materials, such as solvents or inks, must not be discharged to the sewer. The primary wastewater issue you face concerns discharges of silver. Untreated spent fixer from tray development or automated photoprocessors can contain 1,500-5,000 ppm of silver. For purposes of this Compliance Assistance Guide, it is assumed that treated silver-bearing wastes containing less than 2 ppm can be discharged to sewer systems statewide. *Please note however that the requirements of your Municipal Sewer Authority may be more stringent.* You should contact the person responsible for administering your local sewer ordinance to find out (see Appendix D for a list of wastewater treatment facility contacts). In addition, if your facility processes more than 1,600 square feet per day of sensitized materials, (about 2,500 rolls of 135-36 film or 1,000 sheets of 14x17 bulk film) you will be required to obtain a wastewater discharge permit from Vermont's Wastewater Management Division (see Appendix G for contact information).

If photoprocessing wastewater is to be discharged to the sewer, all silver-bearing wastes including fixer, and bleach-fix stabilizers, but not including rinsewater, developer and bleach, must pass through and be treated by a properly designed and operated silver recovery unit. There are several types of silver recovery units. The most common are electrolytic, metallic replacement (steel wool canisters), and ion exchange units. If you use an electrolytic unit, it will need to be used in conjunction with a second stage, or second and third stage, system.

ONSITE DISCHARGES

If your company is not connected to a municipal sewer system, then no non-domestic wastewater (including developer, fixer, stabilizer, rinsewater, fountain solution or platemaking chemistry) should be discharged to a septic tank or other on-site sewage disposal system, or to surface waters. Although a company may have permission to discharge non-domestic wastewater on-site in accordance with a state-issued permit, the potential liability of such a practice should be given serious consideration. If nearby persons depend on groundwater for drinking there is the potential for contamination of a well. Also, if you ever intend on selling the property on which the business is located, even trace amounts of silver in groundwater can exceed the 0.05 ppm "enforcement standard" and possibly result in costly environmental cleanups.

Proposed new or modified discharges of non-domestic wastewater to an on-site system require a permit from the Underground Injection Control Program (UIC) prior to construction. For all existing discharges, a permit application must be completed. The UIC Program will determine whether or not a permit is required based on the information provided on the application.

Non-domestic wastewater that is co-mingled with domestic waste (a "combined waste") and discharged on-site requires a permit. An engineer at the appropriate office of the Wastewater Management Division (WWMD) will process the application. Subsurface discharges of more than 6,500 gallons per day (gpd) are considered "Indirect Discharges" and are reviewed in the central office in Waterbury. Discharges of less than 6,500 gpd require a Wastewater Disposal permit and are reviewed by engineers in the Regional Offices (see Appendix G). For "combined wastes", the application must contain a written determination from the UIC program stating whether or not a UIC Permit is also required. *"The Department strongly discourages the combination of domestic and non-domestic discharges to on-site subsurface disposal systems."*

SELF AUDIT CHECKLIST - WASTEWATER

FACILITIES ON SEWER (Facilities with on-site discharges go to “Facilities Discharging On-Site”)

1. Our facility is on a sewer system, and we do not discharge untreated silver-bearing photoprocessing wastes to the sewer.

Yes No N/A

P2 TIP:

Investigate dry imaging systems and digital prepress technologies which can eliminate the need for wet chemical photoprocessing. The cost of direct-to-film or direct-to-plate digital equipment may be less than the cost of silver recovery, shipping spent fixer, laboratory testing and maintenance over time.

P2 TIP:

Install a recirculating electrolytic silver recovery unit on your processor. These units remove silver from the fixer bath and return the desilvered fixer to the processor. Fixer replenisher rates can be reduced by 60-90%.

P2 TIP:

Cleaning up right after a job is done is easier and requires less solvent.

2. Our facility is on a sewer system and we discharge to the sewer only treated silverbearing photoprocessing wastes less than 2 ppm for silver and we have obtained the approval of the Municipal Sewer Authority for this discharge.

Yes No N/A

HINT:

Municipalities have the right to impose more stringent discharge requirements. If your treated discharge exceeds 2 ppm for silver, then you must contact the Wastewater Management Division (WWMD) for approval as well. You will need to obtain a “pretreatment permit” from WWMD if photoprocessing operations at your facility exceed 1,600 square feet per day of sensitized material.

3. We have a properly engineered silver recovery system that is operated and maintained according to the manufacturer’s specifications.

Yes No N/A

HINT:

Keep a log of your cartridge installation and replacement dates. It is also important to train employees in proper operation and maintenance of silver recovery equipment and in spill procedures.

P2 Tip:

Silver recovery cartridges provide a relatively low cost method of removing silver from spent fixer and rinsewater.

4. At least once a year we collect a representative sample of all photoprocessing wastes (after any treatment equipment) and have it tested for silver by a certified lab to ensure that we do not exceed 2 ppm silver.

Yes

No

N/A

HINT:

The effluent sample should include, fixer, developer and rinsewater and any silver-bearing wastes from miscellaneous equipment, such as water-based proofing machines and image setters. Keep logs the sample dates and results for at least three years.

5. We have platemaking operations and we discharge only non-hazardous aqueous-based platemaking chemistry to the sewer. (Check N/A if platemaking chemistry is not aqueous.)

Yes

No

N/A

6. We have an acid-based platemaking process and either manage all platemaking wastes as hazardous or we pre-treat such wastes on-site and discharge with the approval of our Municipal Sewer Authority. (Check N/A if process is not acid-based.)

Yes

No

N/A

NOTE:

In general, discharges shall not be allowed with pH lower than 5.0.

P2 Tip:

Eliminate the use of hazardous platemaking chemicals by switching to an aqueous platemaking process. Plate quality is at least as good and it will reduce employee exposure to hazardous materials.

7. We use a solvent-based platemaking chemistry and manage all related wastes as hazardous wastes. (Check N/A if you do not use solvent-based chemistry.)

Yes No N/A

8. We do **not** discharge any waste ink, petroleum products or regulated solvents to the sewer.

Yes No

HINT:

Printing equipment should not be washed in sinks without precleaning and drying.

BMP:

Place signs at all sinks to remind employees that press cleaning solvents, inks and other hazardous wastes should not be disposed of down the drain.

9. We do not discharge any waste fountain solution to the sewer system.

Yes No N/A

NOTE:

If waste fountain solution contains greater than 5% by weight petroleum (from inks) or certain “listed” chemicals that might be present in cleanup solvents, it will be hazardous waste and must be managed as such. This represents a good opportunity to practice pollution prevention in order to reduce or eliminate hazardous constituents so waste fountain solution is not hazardous.

10. We discharge waste fountain solution with the approval of the Municipal Sewer Authority.

Yes No N/A

FACILITIES DISCHARGING ON-SITE

1. Our facility is on a septic system and we do not discharge any industrial waste or process chemicals to the system.

Yes No N/A

HINT:

As explained above, the recommendation is that no process wastewater be discharged on-site. For environmental and liability reasons, it is far preferable to implement pollution prevention opportunities wherever possible to minimize process wastewater. Once source reduction and recycling opportunities have been evaluated, it may be possible to evaporate certain non-hazardous, aqueous wastewater using pre-engineered equipment, contact the Air Pollution Control Division (*see Appendix G for contact information*).

2. Our facility is on a septic system and we discharge process wastewater to the system and we have applied for a permit from the Underground Injection Control (UIC) Program (*see Appendix G for contact information*).

Yes No N/A

HINT:

Any on-site discharge of non-domestic wastewater to the subsurface must be permitted by the UIC program. If the discharge combines sanitary wastewater with industrial wastewater, then the discharge requires a permit from the Wastewater Management Division.

NOTE:

It would be difficult and expensive to treat certain wastewater components (like waste fixer) such that the groundwater enforcement standard for silver (0.05 ppm) is sufficiently safeguarded.

3. We are on a septic system and do **not** discharge any waste ink, petroleum products, regulated solvents, non-aqueous platemaking chemistry or other chemicals to the system.

Yes No N/A

NOTE:

It is illegal to discharge hazardous wastes to ground or surface waters.

AIR EMISSIONS

In addition to the explosion and fire potential posed by their use, volatile organic compounds, or “VOCs”, contribute to air pollution and threaten public health. VOCs combine and interact with other pollutants in the air to form “ozone”, the main component of urban “smog”. They are regulated under the federal Clean Air Act and also under Vermont’s Air Pollution Control Regulations .

The printing industry has used VOC-containing products primarily as solvents for fast, thorough cleaning of printing equipment, as viscosity adjusters, or as vehicles to carry pigments in coatings or inks which evaporate to leave the “solid” behind. As printers become more aware of the negative impact of VOCs, many are making significant efforts to substitute less volatile and less toxic products, or reduce the quantities used.

For screen printers, an important source of VOCs is from the use of screen reclamation chemicals. Although not viable for all substrates and product applications, water-based graphic ink systems and alternative screen reclamation chemicals that reduce both the amount of VOCs emitted and waste produced are becoming increasingly available on today’s market.

While of concern as a class of compounds, VOCs can also be of concern individually since many are considered Hazardous Air Pollutants (HAPS). Such chemicals are regulated whenever emissions exceed the established “action level” over an 8 hour period as set in the Vermont Air Pollution Control Regulations.

To learn more about the chemicals you use, including how hazardous they are and the concentration of VOCs they contain, you will need to understand the information provided by your supplier on individual Material Safety Data Sheets (MSDS). The MSDS provides key information to help you determine how you may be regulated.

VOC (and HAP) emissions from non-heatset lithography and screen printing operations are almost always *fugitive* because contaminants are not collected and discharged at a stack, or other exit point. Thus, the key to understanding the extent to which air requirements apply to your facility lies in identifying and quantifying the VOC-content of products that you use. The assumption is that all of the VOCs are evaporated into the air during use.

For ease in explaining regulatory requirements related to air emissions, you need to determine whether you are a Small, Medium or Large Printer based on the volume of VOC-containing press and/or screen cleaning solvents that you have *used* during the past 12 months and the amount of alcohol (or alcohol substitutes) *used* in fountain solution over that period. You may want to rely on purchase records to help determine usage. *Any materials of which you use less than 12 gallons per product per year are considered “incidental materials” and do not have to be included for this analysis.* Also, please be sure to note the Pollution Prevention Tips in this document to see how you might limit emissions in the pressroom to achieve the smallest “environmental size” (small, midsize, or large printer) possible.

In order to complete all the applicable portions of the Air Emissions Checklist it will be necessary for you to first determine which of the following “environmental size” categories best approximates the emissions from your facility.

S M A L L P R I N T E R

You are in the small printer category if your facility emits less than 5 tons per year VOC's. To fall in this category you must use less than 1,375 gallons per year of VOC-containing press and/or screen cleaning solvents (1,375 gallons = 25(twenty-five) 55-gallon drums, assumes material is 100% VOC's) **AND** use less than 55 gallons per year of alcohol for fountain solution.

M I D S I Z E P R I N T E R

You are in the midsize printer category if your facility emits more than 5 tons but less than 10 tons per year VOC's. To fall in this category, you must use more than 1,375 but less than 2,750 gallons per year of VOC-containing press and/or screen cleaning solvents (2,750 gallons = 50 (fifty) 55-gallon drums, assumes material is 100% VOC's) **OR** more than 55 gallons of alcohol for fountain solution.

L A R G E P R I N T E R

You are in the large printer category if your facility emits more than 10 tons per year VOC's, in other words, if you use more than 2,750 gallons per year of VOC-containing press and/or screen cleaning solvents. (Assumes material is 100% VOC's.)

SELF AUDIT CHECKLIST - AIR EMISSIONS

PRINTERS OF ALL SIZES

1. We maintain purchase and/or usage records for at least three years to document which “Environmental Size” category we fall into.

Yes

No

HINT:

Any on-site discharge of non-domestic wastewater to the subsurface must be permitted by the UIC program. If the discharge combines sanitary wastewater with industrial wastewater, then the discharge requires a permit from the Wastewater Management Division.

P2 TIP:

To Minimize Solvent Use :

- ➊ monitor quantity used by different press operators;
- ➋ make sure wash-up blade has proper angle against rollers;
- ➌ reuse solvent for gross cleaning;
- ➍ use pumps on solvent containers with proper fit to minimize spills and evaporation;
- ➎ purchase automatic blanket washer when ordering a new press.

2. We keep the MSDS for each press/screen cleaning solvent product, and for any fountain solution additives that we use for at least three years.

Yes No

3. We have determined that the presswash, blanketwash, rollerwash, and other solvent cleanup products (not including “incidental materials”) that we use are 30% or less VOC by weight, or which have a composite vapor pressure of less than or equal to 10 mm Hg at 68 degrees F.

Yes No N/A

NOTE:

At the time this guidance was developed, this standard had been established under the federal Control Technology Guidelines (CTG) for Offset Lithographers with emissions of more than 15 lbs VOC/day and was considered likely to be adopted by the State for inclusion in the Vermont Air Pollution Control Regulations sometime in 1997.

P2 TIP:

Evaluate low VOC, low vapor pressure, and water miscible press wash products to reduce VOC emissions associated with press cleaning.

P2 TIP:

Don't pour liquid solvent directly on to rags for press cleaning. Also, don't line drip trays with rags or shop towels.

4. We have determined that our fountain solution does not contain exclusively alcohol **or** that it does not contain both alcohol and VOC-containing alcohol substitutes greater than 5% by volume unrefrigerated or 8% by volume refrigerated (60 degrees F).

Yes No N/A

NOTE:

As in #3 above, this standard is contained in the federal CTG and is considered likely to be adopted in State regulations in 1997. For your information, other significant and related aspects of the CTG include: (a) for web printers only, the total concentration of alcohol must not exceed 1.6% by volume unrefrigerated or 3% by volume refrigerated (60 degrees F); (b) newspapers must not use alcohol in fountain solution; and (c) any press with a fountain solution reservoir which holds less than 1 gallon of fountain solution mixture is not subject to any alcohol concentration limits.

P2 TIP:

Using low VOC alcohol substitutes is currently one of the best methods printers can use to lower air emissions.

P2 TIP:

Determine the economic feasibility of installing fountain solution chilling equipment and/or a centralized dispensing unit to minimize material use and emissions.

5. My printing operations are below the “action level” for any hazardous air pollutant(s). If not, I have informed the Air Pollution Control Division. Please refer to the “HAP Calculation Steps” in Appendix E for help with “action level” determinations.

Yes

No

HINT:

Typical hazardous chemicals used in the printing industry and their respective action levels are shown below. Those most likely to pose a compliance problem are bolded. (For a complete list, see Appendix B of the Air Pollution Control Regulations or you can get a copy by calling the Air Division at 241-3840.)

NOTE:

If your facility exceeds the action level for any HAP, the Air Division will require that a Hazardous Most Stringent Emission Rate (HMSER) determination be made. Such an evaluation is based on the current technology and cost of emission reduction alternatives and it is likely that you will be asked to evaluate the use of substitute chemicals as part of this requirement.

P2 TIP:

Identify any products you are using which contain a Hazardous Air Pollutant(s). Work with vendors to learn of the availability of “substitute” products. Many Vermont printers have succeeded in eliminating 1,2,4 - trimethylbenzene from their presswash.

HAZARDOUS AIR CONTAMINANT	ACTION LEVEL (LBS./ 8 HOURS)
ETHYL BENZENE	1,830
ISOPROPYL ALCOHOL	4,120
METHYL ETHYL KETONE (MEK)	248
METHYL ISOBUTYL KETONE (MIBK)	25
METHYLENE CHLORIDE	0.16
TOLUENE	464
TRICHLOROETHYLENE	0.034
XYLENE	86.3
1,2,4-TRIMETHYL BENZENE	0.013
1,1,2-TRICHLOROETHANE	0.0049

6. We keep containers of new and used solvent closed or covered when they are not in use.

Yes No

BMP:

Use spring-loaded covers for solvent containers.

FOR MIDSIZE AND LARGE PRINTERS ONLY *(In addition to the above.)*

1. We have completed a VOC calculation for any VOC-containing press/screen cleaning solvent and VOC-containing fountain solution used at the facility. (Not including “incidental materials”.)

Yes No

HINT:

VOC calculation instructions are included in Appendix E.

2. Our VOC calculations show that emissions from the facility do exceed **5 tons per year** and we have informed the Air Pollution Control Division.

Yes No N/A

NOTE:

Facilities emitting more than 5 tons annually must complete a “source registration” with the Air Pollution Control Division (*see Appendix G for contact information*). If your calculation indicates that less than 5 tons were emitted for the year, check the box marked “N/A” here and for #3 below.

3. We keep a log listing monthly cleaning solvents usage and whenever alcohol is used in fountain solution for mixing a new batch or when it is added on-press.

Yes No N/A

FOR LARGE PRINTERS ONLY (*In addition to all of the above*)

1. We have completed a VOC calculation for all VOC-containing products, except “incidental materials”, used at the facility.

Yes No

HINT:

VOC calculation instructions are included in Appendix E.

2. Our VOC calculations show that emissions from the facility do exceed **10 tons per year** and we have informed the Air Pollution Control Division.

Yes No N/A

NOTE:

Facilities emitting more than 10 tons annually must apply for an “operating permit” from the Air Pollution Control Division (*see Appendix G for contact information*). If your calculation indicates that less than 10 tons were emitted for the year, check the box marked “N/A” here.

Appendix A:

Hazardous Waste Notification Form and Instructions

INSTRUCTIONS FOR COMPLETING THE U.S. EPA NOTIFICATION OF REGULATED WASTE ACTIVITY FORM

Background: A hazardous waste is any waste which is listed as such in hazardous waste management regulations or that is corrosive, ignitable, reactive, toxic, or infectious. These broad categories include many of the wastes commonly produced by businesses in Vermont. Everyone who manages hazardous waste (e.g.: who creates, stores, transports, treats, recycles, or disposes of it) is a “handler” of that waste.

Notification Requirement:

- Section 7-104 of the Vermont Hazardous Waste Management Regulations requires that “**Any person who generates or transports hazardous waste or who owns or operates a facility for the treatment, storage, use, disposal, or recycling of hazardous waste shall notify** the Secretary of such activity” (this includes the generation, marketing, burning, and/or transportation of waste oil).
- Hazardous waste handlers are required to maintain an up-to-date notification form with this Division which accurately describes current waste activity, on-site waste generation, and ownership of the hazardous waste handler. **There is no fee for notifying.**
- Submittal of a notification form results in a permanent, location-specific U.S. EPA identification number being issued to that hazardous waste handler’s site of operations.
- If a company handles hazardous waste at more than one location, a separate EPA identification number is needed for each (unless they are on adjacent parcels of land with the same land owner).
- Notification is also required upon transferral of ownership of an entity that was required to notify previously for a hazardous waste activity.

The attached two-sided U.S. EPA Notification of Regulated Waste Activity form must be completed by all hazardous waste handlers in Vermont and submitted to the Vermont Waste Management Division. Please leave a blank box between words when filling in the form. When filling out Section I of the form, check “first notification” if your location either does not have an identification number or if a 12-digit number beginning with the letters “VTP” (used to denote a provisional, or temporary, ID number) has been issued. If the location has a 12-digit number beginning with other letters (e.g.: VTD, VTR, VT5), mark that this is a “subsequent notification.” Directions included in sections of the form refer to the enclosed EPA Notification of Regulated Waste Activity instruction booklet.

Finally, when completing Section IX of the form, refer first to the attached list of Frequently-Used State and Federal Hazardous Waste Codes; this is a listing of commonly-generated Federal hazardous wastes (with their codes) as well as the 13 Vermont-listed hazardous wastes. A complete listing of the Federal codes, with detailed definitions, may be found in the EPA instruction booklet on pages 51 through 71. A blank notification form is also included in the back of the booklet; please keep this form in case your company has to submit an updated notification form in the future.

*A fact sheet on determining the regulatory status of hazardous waste generators is on the other side of this sheet. **For further assistance in completing this notification form, feel free to contact Sherri Kasten at (802) 241-3867. For more information regarding the Vermont Hazardous Waste Management Regulations, or if you are unsure whether the waste you handle is hazardous, please contact the Waste Management Division at (802) 241-3888.***

FACT SHEET:

DETERMINING REGULATORY STATUS FOR HAZARDOUS WASTE “GENERATORS”

Inquiries to the Waste Management Division suggest that many companies in Vermont that create hazardous waste are confused about their regulatory status. Generally, these companies are divided into two groups, **conditionally exempt generators** (CEGs) and (fully-regulated) **generators** based upon the quantity of waste they generate. Generators are subject to a much larger portion of Vermont’s Hazardous Waste Management Regulations (VHWMR) than are CEGs.

A company is fully-regulated as a **generator** if that company:

- ➔ Generates more than 220 pounds (100 kilograms) of hazardous waste in any month of the calendar year; or
- ➔ Generates more than 2.2 pounds (1 kilogram) of acutely hazardous waste* in any month of the calendar year; or
- ➔ Generates more than 220 pounds (100 kilograms) of any residue or contaminated soil, waste or debris resulting from clean-up of a spill of any acutely hazardous waste in any month of the calendar year; or
- ➔ At any one time has accumulated more than 2,200 pounds (1,000 kilograms) of hazardous waste, 2.2 pounds (1 kilogram) of acutely hazardous waste, or 220 pounds (100 kilograms) of any residue or contaminated soil, waste or debris resulting from clean-up of a spill of acutely hazardous waste.

Generators are subject to all provisions of Subchapter 3 as well as portions of other subchapters of the VHWMR. Companies routinely producing or having accumulated less than the amounts of hazardous waste described above are regulated as CEGs and are subject only to the requirements of VHWMR Section 7-303. If your company only occasionally meets the criteria of a generator, you may ask this office (in writing) to be considered a CEG for the months of the year that your company does not meet the generator criteria (Section 7-303(2) of the VHWMR). Additionally, it is important that you calculate your company’s status by tracking the amount of hazardous waste **generated** per month. Status is not based on how much hazardous waste is **shipped**.

The non-regulatory Environmental Assistance Division of the Agency of Natural Resources is available to provide assistance in reducing the quantity of hazardous waste produced; contact them at 1-800-974-9559.

For more information regarding Vermont’s Hazardous Waste Management Program and/or the Vermont Hazardous Waste Management Regulations, please call the Waste Management Division at (802) 241-3888.

**Acutely hazardous waste is listed in the VHWMR, Appendix IV, and defined in 40 CFR 261.33.*

STATE AND FEDERAL HAZARDOUS WASTE CODES FREQUENTLY-USED BY THE PRINTING INDUSTRY

This is only a partial list of hazardous waste codes. For a complete listing, or for assistance in completing the notification form, refer to the Vermont Hazardous Waste Management Regulations (VHWMR) and/or contact the Hazardous Waste Section of the Vermont Waste Management Division at 802-241-3888 or the non-regulatory Environmental Assistance Division at 800-974-9559.

Wastes identified by a “D” code are those that are considered hazardous because they exhibit one or more of the following characteristics; ignitability, corrosivity, reactivity, and/or toxicity (see the VHWMR for definitions of these terms). Common “D” coded wastes generated in the printing industry are:

D001 - ignitable (flash point of less than ~ 140 F)

D002 - corrosive (pH ≤ 2 or ≥ 12.5)

Other “D” codes for hazardous wastes exhibiting the characteristic of “toxicity” are shown below. Wastes containing any of the materials listed, in amounts that exceed the concentrations given are hazardous toxicity. This is usually determined either through knowledge of the materials and processes generating the waste or by subjecting a representative sample of the waste to an analytical test called the “Toxicity Characteristic Leaching Procedure (TCLP)”. Printing wastes that may need to be identified as “toxic” are inks (some inks contain heavy metals), fixer (typically contains silver in concentrations greater than 5.0 mg/l) and press wash solvent (may contain listed constituents).

D004 - Arsenic (5.0 mg/l)

D005 - Barium (100.0 mg/l)

D006 - Cadmium (1.0 mg/l)

D007 - Chromium (5.0 mg/l)

D008 - Lead (5.0 mg/l)

D009 - Mercury (0.2 mg/l)

D010 - Selenium (1.0 mg/l)

D011 - Silver (5.0 mg/l)

D018 - Benzene (0.5 mg/l)

D026 - Cresol (200.0 mg/l)

D035 - Methyl ethyl ketone (200.0 mg/l)

D039 - Tetrachloroethylene (0.7 mg/l)

D040 - Trichloroethylene (0.5 mg/l)

The following codes are used for “listed” hazardous wastes. Please note that the following codes are used if the process is descriptive, no matter what the concentration of hazardous constituent is in the total resultant waste (e.g. a disposable rag used to apply a product that contains >10% xylene by volume would be coded F003).

F001 The following spent halogenated solvents used in degreasing (if $\geq 10\%$ by volume of the unused product): Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons. Also still bottoms from these spent solvents and solvent mixtures.

F002 The following spent halogenated solvents (if $\geq 10\%$ of the unused product): Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoro-ethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane. Also still bottoms from these spent solvents and solvent mixtures.

F003 The following spent non-halogenated solvents (if $\geq 10\%$ of the unused product): Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol. Also still bottoms from these spent solvents and solvent mixtures.

F004 The following spent non-halogenated solvents (if $\geq 10\%$ of the unused product): Cresols and cresylic acid and nitrobenzene. Also still bottoms from these spent solvents and solvent mixtures.

F005 The following spent non-halogenated solvents (if $\geq 10\%$ of the unused product): Toluene, methyl-ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, and 2-nitropropane. Also still bottoms from these spent solvents and solvent mixtures.

VERMONT LISTED WASTES

[Note: A Vermont hazardous waste that also meets the definition of a Federal hazardous waste must be identified by its U.S. EPA waste code.]

VT02 Waste containing greater than 5% by weight of petroleum distillates with melting points of less than 100 F, including but not limited to kerosene, fuel oil, hydraulic oils, lubricating oils, penetrating oils, tramp oils, quenching oils, and crankcase and automotive oils which have not been exempted under the VHWMR Section 7-203(14). Note: Waste petroleum distillates with a flashpoint less than 140 F are classified as D001 (ignitable).

VT08 Waste ethylene glycol based coolants, antifreezes and solutions containing greater than 700 ppm of ethylene glycol.

VT09 All residues from the bottoms of tanks (tank bottoms) containing any materials which exhibit a characteristic described in Sections 7-204 through 7-207 or are listed in Sections 7-210 through 7-214.

VT10 Waste organic solvent based paint and inks, and paint varnish remover or stripper including, but not limited to, sludges and skimmings.

Appendix B:

Hazardous Waste Manifest Information

The Hazardous Waste Manifest

A manifest is a multiple copy shipping form that is used to track the movement of a hazardous waste from the place of its generation to the place of its final disposal. If the final resting place in this “cradle to grave” system is a hazardous waste landfill, some wastes will need to be accompanied by a second form to certify they meet certain pre-disposal treatment standards. This form is called the Land Disposal Restriction (LDR) Notification. Every shipment of hazardous waste must be accompanied by at least a Uniform Hazardous Waste Manifest and possibly by an LDR form.

In most cases, your hazardous waste transporter will help you get your wastes pre-approved for disposal and will provide you with completely filled out manifests and, if necessary, LDR forms. The Waste Management Division (WMD) can provide a list of certified transporters. Contact the WMD at 802-241-3888.

Although you may only have to sign the manifest, you are still responsible for all of the information on it. It is a good idea to check the form to make sure the information is correct and complete. Instructions on how to complete the form are usually printed on the back. After the transporter has accepted your waste he will sign the form and then give you several copies. Make sure you get the right copies. The copies are numbered and have printed on them where they are to be sent.

The following sample manifest is for a hypothetical print shop in Vermont using a New Jersey hazardous waste transporter to send its waste to a facility in Ohio. Many states require hazardous wastes being shipped into their state to be reported on their state’s manifest form. Nevertheless, the US EPA requires all states to use the same basic form. LDR notifications vary by transporter.

SHIPPING HAZARDOUS WASTES

Conditionally Exempt Generator Options

On paper, Vermont's Conditionally Exempt Generators (CEGs) have a variety of ways to legally dispose of small quantities of hazardous waste they generate. However, not all options are equally available:

OPTIONS	LIMITATIONS
A CEG may self-transport its hazardous waste to a certified solid waste facility in Vermont allowed to accept small quantities of hazardous waste.	No landfill permit issued in Vermont currently allows hazardous waste to be accepted. Municipal or solid waste district household hazardous waste (HHW)/CEG hazardous waste collection facilities or events qualify here but are often limited by town or district.
A CEG may self-transport its hazardous waste to a certified hazardous waste treatment, storage, or disposal facility (TSDF).	Don't just show up at a TSDF's loading dock. The waste has to be pre-approved by the TSDF and its arrival scheduled. As with all self transport, be sure to follow DOT hazardous materials transport rules.
A CEG may send its hazardous waste to a facility which uses, reuses, recycles, reclaims or treats the waste prior to its use, reuse, recycling or reclamation.	Self-transport is possible, limited as stated above. Depending on the waste and its destination, a hazardous waste transporter or a hazardous waste manifest may be needed.
A CEG may send its hazardous waste to a TSDF using a certified hazardous waste transporter and a manifest, in the same way fully regulated generators ship their hazardous waste.	Since you are often paying for a range of services, convenience and expertise, costs may be higher.

Fully Regulated Generator Options:

OPTIONS	LIMITATIONS
Generators must use manifests and certified hazardous waste transporters to send all of their hazardous waste to certified TSDFs.	The only exemptions to this are: for waste oils that are rerefined; scrap metals, precious metals, and lead-acid batteries that are reclaimed and for on-site recycling.

Appendix C:

FACT SHEET: Laundering Hazardous Waste-Contaminated Reusable Absorbents

A waste material is considered to be a hazardous waste in Vermont if it exhibits a hazardous waste “characteristic” or is contaminated with one or more “listed” hazardous wastes **unless** the waste is specifically exempted from the regulations in some manner. Section 7-209 of Vermont’s Hazardous Waste Management Regulations (VHWMR) contains information as to the various “lists” of hazardous wastes; Sections 7-204, 7-205, 7-206, and 7-207 define the hazardous characteristics of ignitability, corrosivity, reactivity, and toxicity, respectively.

Wipers, shop towels, and other reusable absorbents that are contaminated with “listed” hazardous waste or that exhibit a hazardous waste “characteristic” are by policy considered to be exempt from the provisions of the VHWMR **only** if the following management practices are followed:

- ➔ the hazardous waste-contaminated reusable absorbents are picked up, cleaned, and delivered back to the customer under a contractual agreement with a commercial laundering service which uses either a solvent-based dry cleaning or a water-based laundering process to clean the wipers/absorbents; and,
- ➔ hazardous waste has not been disposed of onto the wipers and free liquid hazardous waste is not present as per the paint filter liquids test (EPA SW 846 method 9095); and,
- ➔ hazardous-waste contaminated reusable absorbents that are on-site prior to being picked up by the laundering service are:
 - stored in closed bags or other containers on an impervious surface in a roofed enclosure (so as to be protected from the elements); and,
 - identified as being used absorbents destined for laundering; and,
- ➔ the laundering facility manages all residuals and waste from laundering the hazardous waste-contaminated reusable absorbents either:
 - as hazardous or solid waste per requirements of the VHWMR or the applicable state regulations in the state where the commercial laundering occurs, or
 - in accordance with applicable federal or state wastewater discharge requirements (e.g.: a National Pollutant Discharge Elimination System (NPDES), or a pre-treatment permit (that allows the wastewater discharge to a municipal wastewater treatment plant) if such permit is required, local sewer use ordinances, etc.).

Under this policy exemption—provided that all of the above management requirements are met—reusable absorbents that have been soiled with hazardous waste(s):

- ➔ would not have to be managed as hazardous waste when at the generator’s facility (although they must be stored as outlined above); and,
- ➔ do not need to be shipped under a manifest to a licensed hazardous waste Treatment, Storage, or Disposal facility; and,
- ➔ do not count toward the total monthly on-site generation of hazardous waste.

Generators of these contaminated absorbents should be aware that the contaminated materials may still be considered to be hazardous substances and that liability remains with the generator in the event of mismanagement or environmental contamination caused by the contaminated absorbents. Generators should consider this fact when choosing a laundering vendor and when deciding upon the type of laundering process or other management option for their contaminated wipers.

Any absorbents that are contaminated with a Vermont or federal “listed” hazardous waste or that exhibit a hazardous “characteristic” and are not handled as specified above must be managed as hazardous waste in accordance with the VHWMR.

For clarification of this fact sheet, or for more information regarding Vermont’s Hazardous Waste Management Program and/or the Hazardous Waste Management Regulations, please contact the Waste Management Division at (802) 241-3888.

Please note that it is the generator’s responsibility to meet all Vermont Occupational Safety & Health Act (VOSHA) requirements regarding the storage of hazardous materials (including, for example, reusable absorbents managed in accordance with this exemption that are contaminated with an ignitable material). For information regarding VOSHA requirements, you may contact the Vermont Department of Labor & Industry’s office of Occupational Safety at (802) 828-2765 or VOSHA’s non-regulatory assistance program (“Project Worksafe”) at 1-800-287-2765.

Appendix D:

Municipal Wastewater Treatment Facilities

FACILITY OWNER/CONTACT	PHONE #	FACILITY NAME/CHIEF OPERATOR	PHONE #
Alburg~Village of Henry Baker	802-796-3763	Alburg Alton Brusio	802-796-3810
Barre~City of Steve Micheli	802-476-6885	Barre City Joseph Rouleau	802-476-0261
Barton~Village of Michael Danforth	802-525-4747	Barton Stephen Mooney	802-525-3219
Bellows Falls~Village of Roberta Smith	802-463-3964	Bellows Falls Michael Malick	802-463-3044
Bennington~Town of Paul Bohne	802-442-1037	Bennington Terrance Morse	802-442-4544
Benson~Town of Guy Charlton	802-537-2611	Benson Rita Charlton	802-537-2611
Bethel~Town of Delbert Cloud	802-234-9340	Bethel Timothy Mills	802-234-9741
Bradford~Village of Louise Allen	802-222-4727	Bradford Dale Thornton	802-222-9640
Brandon~Town of Arthur Sanborn	802-247-3635	Brandon Stephen Cijka	802-247-6730
Brattleboro~Town of Stephen Barrett	802-254-4255	Brattleboro George Dow	802-257-2318
Bridgewater~Town of Nelson Lee Jr.	802-672-3334	Bridgewater Rodney Miller Jr.	802-672-5099
Brighton~Town of Reginald Hunt	802-723-4880	Brighton Ronald Maxwell	802-723-4424
Burlington~City of Laurie Adams	802-862-6404	Burlington Main Stephen Foster	802-862-6565
Burlington~City of Laurie Adams	802-862-6404	Burlington North Stephen Foster	802-862-7164
Burlington~City of Laurie Adams	802-862-6404	Burlington River Gary Greenwood	802-863-4878
Canaan~Town of Ursala Johnson	802-266-3370	Canaan Robert Kimball	802-266-7723
Castleton~Town of C William Mulholland	802-468-5319	Castleton Edward Tracey	802-468-5315
Cavendish~Town of Richard Svec	802-226-7291	Cavendish Howard Pixley	802-226-7743
Chelsea~Town of Phillip Mulligan	802-685-4460	Chelsea Hale Mattoon	802-685-7727
Chester~Town of Susan Spaulding	802-875-2173	Chester Barry Goodrich	802-875-4325

FACILITY OWNER/CONTACT	PHONE #	FACILITY NAME/CHIEF OPERATOR	PHONE #
Cold Brook FD#1 Rhea Clark	802-464-0460	Cold Brook-Base Arthur Wright	802-464-2191
Cold Brook FD#1 Rhea Clark	802-464-0460	Cold Brook-Golf Arthur Wright	802-464-5341
Danville~Town of Steve Parker	802-684-3352	Danville Leslie Parker	802-684-2108
Enosburg Falls~Village of Stephen McNeil	802-933-4443	Enosburg Falls Samuel Gates	802-933-6669
Essex Junction~Village of Charles Safford	802-878-6944	Essex Junction James Jutras	802-878-6943
Fair Haven~Town of Patricia Hadam	802-265-3010	Fair Haven Peter Laramie	802-265-3544
Fairfax~Town of J Douglas Webb	802-849-6111	Fairfax Randy DeVine	802-849-6033
Hardwick~Town of Joyce Chase	802-472-6120	Hardwick Jefferson Tolman	802-472-5939
Hartford~Town of Mike Lavalla	802-295-3622	Hartford-WRJ Larry Rogers	802-295-6563
Hartford~Town of Mike Lavalla	802-295-3622	Quechee Larry Rogers	802-295-9528
Hinesburg~Town of Edwin Gallagher	802-482-2096	Hinesburg Edwin Gallagher	802-482-2590
Jeffersonville~Village of William Litchfield	802-644-5523	Jeffersonville Glenn Brooke	802-644-5534
Johnson~Village of Harlan Lumbra	802-635-2611	Johnson Donald Garrett	802-635-2951
Ludlow~Village of Paul Hughes	802-228-2841	Ludlow Loran Greenslet	802-228-8431
Lunenburg Fire District #2 Randy Smith	802-892-5376	Lunenburg FD#2 Wayne Graham	802-892-7780
Lyndon~Town of David Dill	802-626-5834	Lyndonville Dean Blake Jr.	802-626-5939
Manchester~Town of Jefferey Wilson	802-362-1313	Manchester Alan Baccei	802-362-3339
Marshfield~Village of Constance Durkee	802-426-3260	Marshfield Gordon Durkee Sr.	802-426-3257
Middlebury~Town of Betty Wheeler	802-388-4041	Middlebury Robert Wells	802-388-7994
Milton~Town of James McSweeney	802-893-1605	Milton Roger Hunt	802-893-1170
Montpelier~City of Durwood Lamb	802-223-9508	Montpelier Ronald Mercier	802-223-9511
Morrisville~Village of O Neal Demars	802-888-6370	Morrisville Donald Ward	802-888-3138
Newport~City of Keith Southworth	802-334-5136	Newport City Roger Baraw	802-334-8886

FACILITY OWNER/CONTACT	PHONE #	FACILITY NAME/CHIEF OPERATOR	PHONE #
North Branch FD# 1 Linda Holland	802-464-7560	North Branch FD# 1 John West	802-464-8415
North Troy~Village of Helene Loux	802-988-4700	North Troy Marcel Mayhew	802-988-4787
Northfield~Village of William Lyon	802-485-6121	Northfield Rudy Silvirea	802-485-7355
Orleans~Village of Larry Wilcox	802-754-8584	Orleans Larry Austin	802-754-2150
Orwell~Town of Paul Stone	802-948-2221	Orwell Ruth James	802-948-2221
Pawlet~Town of Richard Hulett	802-325-3309	West Pawlet Jonathan Folger	802-645-0387
Pittsford~Town of Mel Adams	802-483-6500	Pittsford Mark Breznick	802-483-6297
Plainfield~Town of Rose Paul	802-454-8461	Plainfield Jay Jewett	802-454-7173
Poultney~Village of Gary Marcy	802-287-4003	Poultney Jerry Skira	802-287-9727
Proctor~Town of Charles Nichols Jr.	802-459-3333	Proctor Warren McCullough	802-459-2789
Putney~Town of James Mullen	802-387-5862	Putney Robert Carr	802-387-4345
Randolph~Town of William Herman	802-728-5433	Randolph Paul Stratton Jr.	802-728-9079
Readsboro~Town of Craig Bartosewcz	802-423-5405	Readsboro Barry Howes	802-423-7681
Richford~Village of Gary Snider	802-848-7752	Richford Garry Shover	802-848-7040
Richmond~Town of Ronald Rodjenski	802-434-2430	Richmond Kendall Chamberlain	802-434-2178
Royalton~Town of Margaret Trombly	802-763-7967	Royalton Ralph Lavigne	802-763-8033
Rutland~City of Warren Conner	802-773-1813	Rutland City Grover Hotaling	802-773-1851
Ryegate~Town of Hoyt Darby	802-757-3605	Ryegate FD# 2 Glen Hamrisky	
Saxtons River~Village of Louise Luring	802-869-2566	Saxtons River Michael Malick	802-869-2725
Shelburne~Town of William Finger	802-985-5110	Shelburne Plant 1 David Rathburn	802-985-3533
Shelburne~Town of William Finger	802-985-5110	Shelburne Plant 2 David Rathburn	802-985-3700
Sheldon~Town of Clarence Bocash Jr.	802-933-2524	Sheldon Springs Andrew Reed	802-933-8359

FACILITY OWNER/CONTACT	PHONE #	FACILITY NAME/CHIEF OPERATOR	PHONE #
Sherburne FD# 1 David Lewis	802-422-3241	Sherburne FD# 1 Daniel Lewis	802-422-3831
South Burlington~City of Donald Whitten	802-658-7953	Airport Parkway Robert Baillergeon	802-658-7964
South Burlington~City of Donald Whitten	802-658-7953	Bartlett s Bay Michael Fortin	802-658-7965
Springfield~Town of Curt Burton	802-885-2104	Springfield Mike Emond	802-885-2854
St Albans~City of William Cioffi	802-524-1500	St Albans Brian Willett	802-524-1509
St Albans~City of William Cioffi	802-524-1500	St Albans Corr Brian Willett	802-524-1517
St Johnsbury~Town of	802-748-3926	St Johnsbury Leroy Houghton	802-748-9124
Stowe~Town of Gregory Federspiel	802-253-7350	Stowe Gregory Lewis	802-253-6153
Swanton~Village of Darwin Longway	802-868-3397	Swanton Jeff Gratton	802-868-3241
Troy & Jay~Towns of Lucille Cadieux	802-888-2663	Troy/Jay Kenneth Hamelin	802-988-2636
Vergennes~City of Melvin Hawley	802-877-3637	Vergennes Martin Williams	802-877-2931
Wallingford FD# 1 Jane Maciejewski	802-446-2964	Wallingford FD# 1 John West	802-446-2325
Wilmington~Town of Sonia Alexander	802-464-8591	Wilmington Stephen Lazelle	802-464-3862
Windsor~Town of Tony Torchia	802-674-6786	Windsor Main Harry Benner	802-674-5950
Windsor~Town of Tony Torchia	802-674-6786	Weston Heights Harry Benner	802-674-5950
Winooski~City of Ann Cookson	802-655-3908	Winooski Tim Grover	802-655-6421
Woodstock~Town of Philip Swanson	802-457-3456	Woodstock Main Rusty Eastman	802-457-1910
Woodstock~Town of Philip Swanson	802-457-3456	Taftsville Russell Eastman	802-457-1910

Appendix E:

How to Calculate Your VOC Emissions

REFERENCE CHART OF POUNDS/GALLONS/TONS	
1 gallon	6-8 pounds (depending on the product's specific gravity)
275 gallons	5 drums x 55 gallons (about 1 ton)
2,000 pounds	1 ton

Step 1: Gather your Material Safety Data Sheets (MSDS) for the following materials (used in excess of 12 gallons per year).

Midsized Printers & Large Printers:

Blanket wash / Roller wash / Press wash / Type wash
Alcohol or alcohol substitutes (including fountain solution concentrate)

Large Printers:

Inks
Proofing system solutions (if alcohol or solvent based)
Parts cleaner (solvent)
Other VOC-containing formulations

Step 2: Complete the following for each product: (see section 2 or 3 of the MSDS for VOC content).

Product name

Line 1: Monthly Usage _____ gallons

Line 2: Monthly Usage _____ pounds

Line 3: VOC emissions/month _____ pounds

Note: The MSDS may list the VOC contents as: VOC lbs/gal of product or VOC % by volume or VOC % by weight.

If shown as VOC lbs/gal of product, simply multiply by Line 1 to get Line 3.

If shown as VOC % by volume, you'll need to contact your supplier (or the product manufacturer) to get VOC lbs/gal or VOC % by weight.

If shown as VOC % by weight, you will need to convert estimated monthly usage in gallons (line 1) to monthly usage in pounds of product (line 2).

Where product weight is in lbs/gal (from MSDS):

- ➡ multiply by Line 1 to get Line 2.
- ➡ change % VOC by weight to decimal (ie. 33% VOC by weight becomes 0.33).
- ➡ multiply decimal by Line 2 to get Line 3.

Where given as specific gravity of product (from MSDS):

- ➡ multiply by 8.34 (the weight of a pound of water) to get the weight of a gallon of product.
- ➡ multiply this number by Line 1 to get Line 2.
- ➡ change % VOC by weight to a decimal.
- ➡ multiply decimal by Line 2 to get Line 3.

NOTE: For “Large Printers” doing non-heatset, sheetfed printing, you may use a 95% retention factor for calculating VOC emissions for inks since the majority of those VOCs are presumed to be permanently bound in the paper and not released. Therefore, multiply VOC for ink in lbs/month by 0.05 to obtain actual VOC emissions in lbs/mo.

Step 3: Add VOC emissions (lbs/mo) for all relevant products to obtain total monthly emissions.

Step 4: Add monthly totals for each month of the year the facility is operating to get actual VOC emissions in annual pounds/yr (divide this number by 2,000 to get actual VOC emissions in tons/yr).

Reminder: *If your actual emissions are over 10 tons, you are required to obtain an operating permit from the Air Pollution Control Division.*

Hazardous Air Pollutant Calculation *(To be done for each HAP of concern)*

Step 1: Use %HAP by weight (from MSDS - if a range is given, use the high end %)

Step 2: Follow the same procedure used to convert “VOC% by weight” to pounds and then to monthly VOC emissions in pounds.

Step 3: Divide this number by the number of “workshifts” per month product was used. This yields the Action Level in pounds per 8 hour period. For example, if product is used on a single shift every day, then divide by 20 (assuming 20 workdays for that month). If a product is used only at the end of the week, divide by 4. Count each shift where product is used as a “workday” since the 8 hour period as used in the Action Level determinations is intended to represent a single “shift”.

Appendix F:

Silver Recovery Equipment Maintenance Log

Period Covered by Log: _____

Processor Number: _____ (Use a separate log for each processor)

Cartridge Installation and Replacement:

Cartridge A:

Installation Date: _____

Replacement Date: _____

Cartridge B:

Installation Date: _____

Replacement Date: _____

Silver Harvesting Dates: _____

Appendix G:

Technical Resources

Department of Environmental Conservation (DEC) Program Contacts

Air Pollution Control Division (APCD)	241-3840
Waste Management Division	241-3888
Hazardous Waste Program	241-3878
Solid Waste Program	241-3444
Wastewater Management Division	
Central Office (Waterbury)	241-3822
Regional Engineering Offices	
Barre	479-3621
Essex Junction	879-6563
North Springfield	886-2215
Rutland	786-5900
St. Johnsbury	748-8787
Water Supply Division	241-3400
Underground Injection Control Program	241-3428
Environmental Assistance Division	800-974-9559
Small Business Compliance Assistance Program	241-3745
Waste Prevention Section	241-3629
Vermont Agency of Transportation (AOT)	
Hazardous Materials Transport	828-2797
Printing Trade Associations	
Printing Industries of New England (PINE)	508-655-8700
Screen Printing & Graphics Imaging Association (SGIA)	703-359-1313
Graphic Arts Technical Foundation (GATF)	412-621-6941
Other Organizations	
Small Business Development Center	728-1423
Environmental Program Coordinator	800-464-SBDC
Retired Engineers and Professionals Program (REAP)	800-464-SBDC
Vermont Manufacturing Extension Center (VMEC)	728-1421