

# COMPLIANCE CERTIFICATION WORKBOOK

MANAGING YOUR ENVIRONMENTAL HEALTH & SAFETY PROGRAMS



## COLORADO

# PRINTING & IMAGING INDUSTRY

For Use with the 2008 Compliance Certification Checklist  
for the Printing & Imaging Industry as a part of Phase II of the  
Printing & Imaging Environmental Results Program

By  
Printing & Imaging Association Mountain States  
& Colorado Department of Public Health & Environment

## **ACKNOWLEDGEMENT**

Printing Services for this project were provided by National Hirschfeld, LLC in Denver, Colorado. We appreciate their support.

# TABLE OF CONTENTS

<b>1.0</b>	<b>GETTING STARTED.....</b>	<b>1</b>
1.1	INTRODUCTION .....	1
1.2	WE ENCOURAGE YOU TO PARTICIPATE .....	2
<b>2.0</b>	<b>SUSTAINABLE DEVELOPMENT .....</b>	<b>2</b>
<b>3.0</b>	<b>SUSTAINABLE MANAGEMENT SYSTEMS (SMS).....</b>	<b>2</b>
3.1	WHAT IS AN SMS MODEL? .....	3
3.2	WHAT ARE THE KEY ELEMENTS OF AN SMS?.....	3
<b>4.0</b>	<b>FOREST STEWARDSHIP COUNCIL .....</b>	<b>4</b>
4.1	WHAT IS FSC? .....	4
4.2	FSC CHAIN-OF CUSTODY CERTIFICATION .....	4
4.3	FSC CERTIFICATION PROCESS .....	4
<b>5.0</b>	<b>BEYOND COMPLIANCE AWARDS AND RECOGNITION .....</b>	<b>5</b>
<b>6.0</b>	<b>HAZARDOUS WASTE .....</b>	<b>6</b>
6.1	DO YOU GENERATE HAZARDOUS WASTE?.....	6
6.2	HAZARDOUS WASTE GENERATOR STATUS .....	6
6.3	GENERATOR STATUS CHANGE REQUIREMENTS .....	7
6.4	REGULATED WASTE NOTIFICATION REQUIREMENTS.....	7
6.5	HAZARDOUS WASTE FEES .....	8
6.6	HAZARDOUS WASTE ACCUMULATION REQUIREMENTS .....	9
6.7	SUMMARY OF GENERATOR REQUIREMENT .....	9
6.8	HAZARDOUS WASTE STORAGE REQUIREMENTS .....	12
6.9	EMERGENCY RESPONSE REQUIREMENTS .....	13
6.10	TOP TEN HAZARDOUS WASTE VIOLATIONS.....	14
<b>7.0</b>	<b>OTHER WASTES .....</b>	<b>15</b>
7.1	USED OIL.....	15
7.2	UNIVERSAL WASTE .....	16
7.3	REUSABLE RAGS, SHOP TOWELS AND ABSORBENTS.....	17
7.4	AEROSOL CANS .....	17
7.5	LAMP WASTES .....	18
7.6	BATTERIES.....	18
7.7	COMPUTER AND OTHER ELECTRONIC WASTES .....	19
<b>8.0</b>	<b>AIR EMISSIONS.....</b>	<b>20</b>
8.1	AIR POLLUTANT EMISSION NOTICES (APENS).....	21
8.2	NON-CRITERIA REPORTABLE ADDENDUM FORM (HAP REPORTING).....	22
8.3	AIR PERMITS.....	23
8.4	REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT).....	23
8.5	CONTROL TECHNIQUE GUIDELINES (CTG).....	24
8.6	ESTIMATING VOC EMISSIONS .....	24
8.7	CALCULATING HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS .....	27
8.8	BOILERS.....	27
8.9	EMERGENCY GENERATORS .....	28
8.10	THERMAL OXIDIZERS.....	29
8.11	RECORDKEEPING REQUIREMENTS.....	29
8.12	AIR EMISSION AND PERMITTING FEES .....	29
8.13	TOP TEN AIR POLLUTANT VIOLATIONS .....	30

<b>9.0</b>	<b>WASTEWATER REQUIREMENTS .....</b>	<b>31</b>
9.1	DISCHARGES TO THE SANITARY SEWER .....	31
9.2	DISCHARGES TO A SEPTIC SYSTEM .....	31
9.3	SHIPMENT OF WASTEWATER OFFSITE.....	32
9.4	TOP TEN NON-DOMESTIC WASTEWATER VIOLATIONS .....	32
<b>10.0</b>	<b>STORMWATER REQUIREMENTS.....</b>	<b>33</b>
10.1	NO EXPOSURE CERTIFICATION .....	33
10.2	STORMWATER PERMITTING .....	33
10.3	TOP TEN INDUSTRIAL STORMWATER VIOLATIONS .....	35
<b>11.0</b>	<b>SPILLS AND REPORTING.....</b>	<b>36</b>
11.1	SPILL RELEASE REPORTING .....	36
11.2	SPILL RESPONSE .....	36
<b>12.0</b>	<b>EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW REQUIREMENTS.....</b>	<b>37</b>
12.1	EMERGENCY RESPONSE PLANNING (EPCRA SECTIONS 301-303).....	37
12.2	EMERGENCY NOTIFICATION (EPCRA SECTION 304).....	38
12.3	COMMUNITY RIGHT-TO-KNOW (EPCRA SECTIONS 311 AND 312).....	38
12.4	TOXIC RELEASE INVENTORY (TRI) (EPCRA SECTION 313) .....	38
12.5	EPCRA FEES .....	39
12.6	TOP TEN EPCRA VIOLATIONS .....	40
<b>13.0</b>	<b>OCCUPATIONAL HEALTH AND SAFETY (OSHA) .....</b>	<b>41</b>
13.1	RIGHT-TO-KNOW .....	41
13.2	HAZARD COMMUNICATION.....	42
13.3	CHEMICAL HAZARDS IN THE WORKPLACE.....	43
13.4	PERSONAL PROTECTIVE EQUIPMENT .....	44
13.5	HEARING CONSERVATION.....	45
13.6	MEDICAL SERVICES AND FIRST AID.....	46
13.7	INJURY AND ILLNESS PREVENTION PROGRAM (IIPP).....	46
13.8	INJURY AND ILLNESS REPORTING .....	46
13.9	MACHINE GUARDING.....	47
13.10	LOCK-OUT/TAG-OUT (LO/TO) .....	47
13.11	EMERGENCY ACTION AND FIRE PREVENTION PLANS .....	48
13.12	EMERGENCY FILE .....	49
13.13	ELECTRICAL SAFETY .....	49
13.14	FORKLIFT SAFETY .....	50
13.15	OSHA RECORDKEEPING.....	51
13.16	OSHA – TOP TEN VIOLATIONS .....	52
<b>14.0</b>	<b>ADDITIONAL CONSIDERATIONS .....</b>	<b>53</b>
14.1	HAZARDOUS MATERIAL HANDLING AND STORAGE.....	53
14.2	HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS).....	54
<b>15.0</b>	<b>CONTINUAL IMPROVEMENT .....</b>	<b>55</b>
<b>APPENDIX A.....</b>	<b>A-1</b>	
DEFINITIONS .....	A-1	
<b>APPENDIX B.....</b>	<b>B-1</b>	
<b>APPENDIX C.....</b>	<b>C-1</b>	
<b>APPENDIX D.....</b>	<b>D-1</b>	
<b>APPENDIX E.....</b>	<b>E-1</b>	
<b>APPENDIX F .....</b>	<b>F-1</b>	



---

## 1.0 Getting Started

---

### 1.1 Introduction

It is with great enthusiasm that the Printing & Imaging Association Mountain States (PIAMS) and the Colorado Department of Public Health & Environment (CDPHE) are working cooperatively to introduce Phase II of our Environmental Results Program (ERP) to the Colorado Printing & Imaging Community. Phase I of this project was a pilot program which began our journey into measuring the compliance efforts of our industry and has led to many firms being verified as PIAMS Green Members and ultimately becoming awarded one year certification as Colorado Environmental Leaders as “Bronze Achievers”. In addition, two of those firms have been granted a three-year designation as “Silver Partners”.

Phase II of our ERP has multiple purposes:

- To promote and measure compliance
- To promote the efforts of the industry
- To promote those who are in compliance with PIAMS Green Member criteria to the print buying community and,
- To promote on-going sustainability efforts

An annual self-audit is a requirement for companies that become PIAMS Green Members to maintain that prestigious standing. Phase II of this Environmental Results Program can be used to begin the process or fulfill the annual self-audit requirement.

PIAMS Green Members are:

- ✓ In compliance with all federal, state and local environmental regulations
- ✓ Have a documented healthy and safe workplace (OSHA Compliant)
- ✓ Have successfully completed an Environmental Results Program
- ✓ Have recycling programs
- ✓ Have implemented pollution prevention strategies
- ✓ Have formal Green Position Statements
- ✓ Have created Sustainability Action Plans
- ✓ Members in good standing with PIAMS

The next step in moving toward a more sustainable business environment is for companies to institute an Environmental Management System or Sustainable Management System (EMS/SMS) which is included in Phase II of the ERP.

## 1.2 We Encourage You to Participate

Phase II of the Printing & Imaging Environmental Results Program is a voluntary program. We encourage all printing and imaging facilities to participate in the Compliance Certification program. On a voluntary basis, you will design, as a part of Phase II, a sustainable management system that more formally addresses management of the environmental health and safety concerns at your printing facility. As you work through the Phase II process, we believe you will find your efforts will be rewarded as you create an effective and sustainable system within your company to meet and exceed regulatory requirements and promote your company as a “Green Printer”.

---

## 2.0 Sustainable Development

---



The printing industry, like many other industries in Colorado, is starting to think “Green”. From recycling to using energy efficient lighting, smart printing companies are starting to realize the benefits of going “Green”. Going “Green” means thinking about wise businesses choices within your company to reduce, reuse, and recycle. It means using vegetable-based or other environmentally-friendly inks. It means recycling press solutions and plates in the printing process. It means being certified by the Forestry Stewardship Council (FSC) or other sustainable forest initiatives or promoting the use of chain-of-custody certified papers. It means saving energy for the future by using lower wattage lighting or actually purchasing renewable energy. Sustainable development is more than thinking “Green”, it is about meeting the demands of the present while taking care that the resources we use today will be available tomorrow. Sustainable development cannot be achieved by a single enterprise; all businesses need to adopt environmentally sound business principles and translate them into action.

The first step to becoming involved in sustainable development in your company is to choose or formulate the sustainable development principles your business is going to follow. The [CERES Principle](#) is a good beginning for businesses wanting to incorporate sustainable development principles into their operating practices. The Coalition for Environmentally Responsible Economies (CERES) includes investors, public pension funds, foundations, labor unions, environmental, religious and public interest groups working in partnership with companies towards the common goal of corporate environmental responsibility. If you prefer to develop your own sustainable development principles then think about incorporating an Environmental Management System (EMS) or a Sustainable Management System (SMS) into your company’s business culture. Through your participation in Phase II of the Environmental Results Program for the Printing & Imaging Industry, you will learn how to develop an SMS. A [Sustainable Management System Template](#) will be available to help you get started. As you complete the Compliance Certification Checklist and begin to develop a sustainable management program at your facility, think about strategies to better manage your health and environmental issues and reduce the burden of compliance with the regulatory requirements outlined in this workbook. Tips for a more Sustainable Business Environment (Pollution Prevention Tips) are included in Appendix B.

---

## 3.0 Sustainable Management Systems (SMS)

---

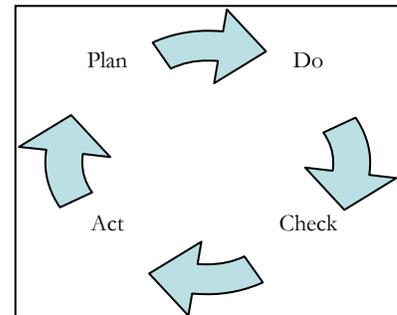


An Environmental Management System or Sustainable Management System (EMS or SMS) is a framework developed by an organization like yours to help improve its environmental performance by taking environmental considerations (also health and safety considerations if feasible) into account when making business decisions and managing risks. Key elements of an SMS are outlined below. The first step to putting together an SMS is to make a commitment and develop an environmental policy; the second is to identify activities, products, and services in your business that impact the environment; the third step is to set goals, objectives and

targets for your program. The concept of sustainable development needs to be incorporated into the policies and processes of your business and these philosophies should become a way of doing business in your company.

### 3.1 What is an SMS Model?

An SMS follows a Plan-Do-Check-Act Cycle, or PDCA. The SMS Model below shows the process of first developing an environmental policy, planning the EMS, and then implementing it. The process also includes checking the system and acting on it. The model is continuous because an SMS is a process of continual improvement in which an organization is constantly reviewing and revising the system. Refer to the [Sustainable Management System Template](#) for the Printing & Imaging Industry for more information on the SMS process and how you can get started in developing your own system.



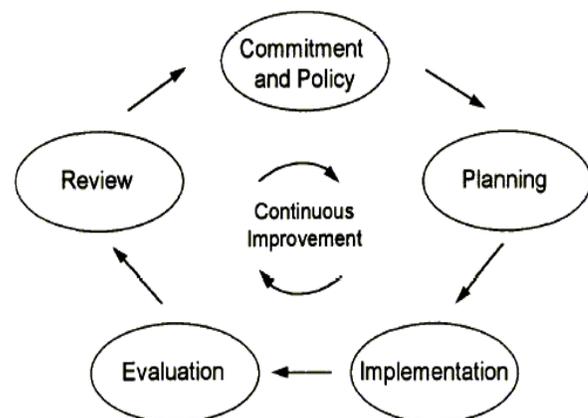
### 3.2 What are the Key Elements of an SMS?

- Policy Statement - a statement of the organization's commitment to the environment (your Green Position Statement). It is crucial to have buy-in from the bottom up (employees to top management).
- Identification of Significant Environmental Impacts - environmental attributes of products, activities and services and their effects on the environment
- Development of Objectives and Targets - environmental goals for the company
- Implementation - plans to meet objectives and targets
- Training - ensure that employees are aware and capable of their environmental responsibilities to help meet your objectives and targets
- Management review – it is imperative that top management participate

#### EMS/SMS Model

##### Key SMS Benefits:

- ✓ Improved environmental performance
- ✓ Reduced liability
- ✓ Competitive advantage
- ✓ Improved compliance
- ✓ Reduced costs
- ✓ Fewer accidents
- ✓ Employee involvement
- ✓ Improved public image
- ✓ Enhanced customer trust
- ✓ Meet customer requirements



## 4.0 Forest Stewardship Council



### 4.1 What is FSC?

The Forest Stewardship Council (FSC) sets the global standards for responsible forestry. FSC requires that a product made of pulp or paper must pass through a “chain of custody” from a FSC-certified forest to a FSC-certified paper manufacturer, merchant and printer. Thus the paper is tracked from the forest to final product and the FSC product label allows consumers to recognize products that support the growth of responsible forest management worldwide.

### 4.2 FSC Chain-of Custody Certification

Chain-of-Custody (CoC) certification assures consumers and forest product companies that the wood they buy comes from certified forests. Since your business is involved in the production or delivery of certified products (paper), you must hold a Forest Stewardship Council (FSC) CoC certificate in order to make claims about the FSC content in your products. Download an application form and the [standards](#) -- note that there is a separate [application form](#) for printers, print brokers and paper merchants.

### 4.3 FSC Certification Process

The Rainforest Alliance’s SmartWood program awards FSC certification based on audit results and issues certificates for five-year periods. The first audit, called the “Assessment”, is the most rigorous as it determines the initial decision to certify. The Assessment is followed by four annual audits.



For all candidates, the first step is to fill out an [application form](#), or to contact a local [SmartWood representative](#). The Printing & Imaging Association Mountain States partners with SmartWood to offer Chain-of-Custody FSC Certification at a discounted rate.

The Assessment for FSC Chain-of-Custody includes the following procedures.

1. The business fills out an application to be certified.
2. A budget is created (the application is not binding until the budget is approved by the candidate company).
3. SmartWood helps your company determine which certification strategy (single, multi-site or group) is the best approach.
4. A service agreement is signed by the company and the Rainforest Alliance.
5. An auditor visits the company to assess its qualifications for certification.
6. The auditor produces an assessment report.
7. The assessment report is reviewed by the candidate company.
8. A certification decision is made.

*There are other paper related certifications that are recognized in the industry: Sustainable Forest Initiative (SFI) and Programme for the Endorsement of Forest Certification (PEFC), both of which also certify what is known as Chain of Custody for paper used by the industry. At present FSC holds the highest recognition in our region.*

## 5.0 Beyond Compliance Awards and Recognition



### Colorado Environmental Leadership Program

The Colorado Environmental Leadership Program (ELP) is a voluntary program that encourages and rewards superior environmental performers that go beyond the requirements of environmental regulations and move toward the goal of sustainability.

- Membership in the program is open to all types of organizations and businesses from large corporate entities to small businesses, government agencies, nonprofits and academic institutions. The Colorado Environmental Leadership Program invites the printing & imaging industry to participate in the program.
- To participate in the leadership program, your company must meet the ELP eligibility related compliance requirements and fit within a specific “tier” of the program. (The criteria are listed below).
- In exchange, leadership members are provided recognition, and regulatory and non-regulatory benefits and incentives from the state (incentives are specific for each tier level).

**Table 1**

Tier	Criteria	Recognition
<b>Bronze Achiever</b>	<ul style="list-style-type: none"> <li>▪ For entities making significant Environmental achievement(s) in improving the environment of Colorado but do not have a functional Environmental Management System (EMS).</li> <li>▪ Clean compliance record for one year prior to applying to the program.</li> </ul>	<b>1 year (not renewable)</b>
<b>Silver Partner</b>	<ul style="list-style-type: none"> <li>▪ For entities who are seeking the Gold Level tier (may or may not have a functional EMS), and are COMMITTED towards meeting the Gold criteria within an agreed upon timeframe, not to exceed three years.</li> <li>▪ Must meet requirements for “beyond-compliance” activities.</li> <li>▪ Clean compliance record for one year prior to applying to the program.</li> </ul>	<b>3 year goal</b>
<b>Gold Leader</b>	<ul style="list-style-type: none"> <li>▪ <b>Currently the Highest Level of State Recognition</b></li> <li>▪ Continual environmental improvement goals that are verifiable and measurable (beyond-compliance).</li> <li>▪ Working towards the goal of sustainability.</li> <li>▪ Fully functional Environmental Management System.</li> <li>▪ Clean compliance record three years prior to applying to the program.</li> <li>▪ Federal equivalent – EPA’s National Performance Track Program.</li> </ul>	<b>3 years (renewable)</b>
<b>(New Tier) Platinum Steward</b>	<ul style="list-style-type: none"> <li>▪ <i>GOAL = Sustainable Management System</i></li> <li>▪ <i>Criteria for this tier are currently being developed.</i></li> </ul>	<b>5 years (renewable)</b>
<b>For more information go to <a href="http://www.cdph.state.co.us/el/elp/elphome.html">www.cdph.state.co.us/el/elp/elphome.html</a> or call 303-692-3477</b>		

## 6.0 Hazardous Waste



As a “Green” printer, you should be thinking of ways to reduce or eliminate the generation of hazardous waste from your printing operations. If you generate hazardous waste, you must manage your hazardous wastes in a safe and environmentally responsible manner. Federal and state regulations place the burden on you as the generator to properly identify and dispose of hazardous waste. The generator is ultimately responsible for the waste from “cradle to grave” and can be held liable for improper management of hazardous waste.

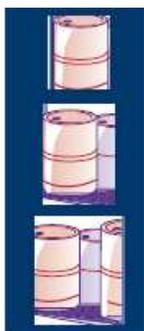
### 6.1 Do You Generate Hazardous Waste?

As a waste generator, it is your responsibility to determine if the waste is hazardous or not. A waste is classified as hazardous if it exhibits any of the characteristics specified by EPA/State regulations or is specifically listed as a hazardous waste in EPA/State regulations (refer to Appendix C).

The classification of a waste is done by either testing the waste using approved methods or using knowledge of the process and materials. In either case, you need to document the waste determination by keeping a record of the results. If the determination is based on test results, you need to keep the lab report. If you apply process knowledge, you need to keep product data sheets, Material Safety Data Sheets (MSDS) or other similar information. In many instances, waste disposal companies will provide you with a waste profile in which a determination of waste classification can be based upon. If you decide to use this information, you need to find out if the waste was actually tested or if the profile was based on a review of the waste from MSDSs or other information.

It is important to understand that in some cases, testing may be required due to the limitations of the information provided on technical data sheets and MSDSs. An MSDS only has to list chemicals that pose a threat to human health and safety that are in concentrations greater than 1% and for carcinogens, 0.1%. A 1% concentration is equivalent to 10,000 ppm (1,000 ppm for a carcinogen); therefore, some ingredients in a product that have the potential to generate a hazardous waste may not be listed on the MSDS. If you have questions, contact the Small Business Assistance Program or other resources listed in Appendix F.

### 6.2 Hazardous Waste Generator Status



**Conditionally Exempt Small Quantity Generator (CESQG)** – generates no more than 100 kilograms (about 220 pounds or 25 gallons) of hazardous waste and no more than 1 kilogram (2.2 pounds) of acutely hazardous waste in any month.

**Small Quantity Generator (SQG)** – generates more than 100 kilograms but less than 1,000 kilograms (between 220 and 2,200 pounds or 25 to 300 gallons) of hazardous waste and no more than 1 kilogram (2.2 pounds) of acutely hazardous waste in any month.

**Large Quantity Generator (LQG)** – generates 1,000 kilograms (~ 2200 pounds or 300 gallons) or more of hazardous waste or more than 1 kilogram (2.2 pounds) of acutely hazardous waste in any month.

*Note: most printing operations do not generate acutely hazardous waste (refer to definitions in Appendix A).*

Your generator status is based on how much hazardous waste (in kilograms) your company generates in each calendar month. Refer to the example in Table 2 below.

**Table 2**  
Monthly Hazardous Waste Generation – Example

Activity	Waste	Hazardous?	Why?	Monthly Quantity (gal)	Monthly Quantity (lb)
Pressroom	Cleaning solvents	Yes	Ignitable (FP <140°F), F-listed	30	250.2
Pressroom	Vegetable-based ink	No	Not toxic or ignitable	Not counted	-
Pressroom	Solvent-based ink	Yes	Ignitable (FP < 140°F)	10	83.4
Pressroom	Specialty Ink	Yes	Toxic (heavy metals)	2	16.68
Post press	Solvent-based adhesive	Yes	Ignitable (FP <140°F), Toxic	5	41.7
<b>Total Hazardous Waste Generated in One Month = Small Quantity Generator</b>				<b>47</b>	<b>392 lb (178 kg)</b>

*Hint: Half of a 55-gallon drum of waste with a density similar to water (8.34 pounds per gallon) weighs about 220 pounds (100 kilograms). Similarly, 300 gallons of this same waste weighs about 2,200 pounds (1,000 kilograms). Gallons of waste x 8.34 (weight of water) = pounds of waste. 1 kilogram = 2.2 pounds.*

### 6.3 Generator Status Change Requirements

A hazardous waste generator can change categories. The category is related to the cumulative amount of hazardous waste generated in any month and this amount may vary from month to month.

If your generator status changes, you must submit a revised “Colorado Hazardous Waste Notification Form” to the Hazardous Materials and Waste Management Division (HMWMD). It is wise to select the highest generator status to which you might be subject even if you are in a lower category some of the time.

### 6.4 Regulated Waste Notification Requirements

#### Who Must Notify

Printing operations that generate or transport hazardous wastes, handle used oil, burn hazardous waste in a boiler or industrial furnace, recycle hazardous waste, or manage large quantities of universal waste must notify the HMWMD of these activities.

Conditionally Exempt Small Quantity Generators (CESQGs) that generate waste codes F001, F002, F004, and/or F005 (halogenated and non-halogenated solvents) are required to notify the HMWMD and obtain an EPA identification number. CESQGs that generate less than three (3) gallons per calendar year of these waste types are exempt from this notification requirement.

#### Application Process

An authorized representative of your printing facility should complete the *Colorado Notification of Regulated Waste Activity Form* and submit a signed copy to the Hazardous Materials Waste Management Division’s Notification Coordinator. The Department will issue a unique EPA Identification Number and

notify the owner or operator as soon as practicable. An EPA identification number is not a permit, it is a number issued by the State and EPA to identify a facility for hazardous waste management purposes. The notification form is available on the web at [www.cdphe.state.co.us/hm/notification.htm](http://www.cdphe.state.co.us/hm/notification.htm) or from the HMWMD. If you have print shops at different locations, every facility that generates hazardous waste will need its own EPA identification number.

**Duration of the Notification**

The notification and EPA Identification Number remain valid until the Department is notified in writing that the facility has changed location, has changed ownership, no longer manages hazardous waste, or until the category or general description of their activities changes.

**6.5 Hazardous Waste Fees**

**Notification Fees**

As of July 2, 2006, Small and Large Quantity Generators submitting a new notification under Part 99 of the hazardous waste regulations (6 CCR 1007-3) must submit a \$100 notification fee with their Colorado Hazardous Waste Notification form. Conditionally Exempt Small Quantity Generators that are required to notify because they generate F001, F002, F004, and/or F005 wastes are not required to pay the \$100 notification fee.

Generators submitting a subsequent notification that downgrades their hazardous waste notification status (for example, from a Large Quantity Generator to a Small Quantity Generator) must also submit a \$100 notification fee with their updated form. Subsequent notifications that are providing or updating other information (for example, contact name change) will not be assessed any fee unless they are also downgrading their notification status. Generators submitting a subsequent notification that upgrades their notification status will not be assessed a notification fee.

The notification fee **must** accompany the completed and signed notification form. The Department will not process the notification without the \$100 fee.

**Annual Fees**

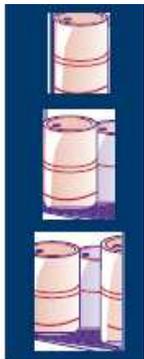
Facilities that generate hazardous waste are billed annually by the HMWMD for the Generator and Hazardous Waste Commission fees. Generator fees are subject to change on an annual basis. Current information on fees is available at [www.cdphe.state.co.us/hm/feenotice.htm](http://www.cdphe.state.co.us/hm/feenotice.htm). Fees for 2007-2008 are listed in Table 3 below:

**Table 3**

Facility Type	Generator Fee	Commission Fee
Conditionally Exempt Small Quantity Generators (generates (3) gallons or more of hazardous waste codes F001, F002, F004, and/or F005 per calendar year.	\$ 100	N/A
Small Quantity Generator (SQG)	\$ 480	\$ 65
Large Quantity Generator (LQG)	\$ 3050	\$ 210

## 6.6 Hazardous Waste Accumulation Requirements

Accumulation of hazardous waste is different than “storage”. Accumulation time is the time allowed under RCRA to accumulate hazardous waste before a generator is required to transport the hazardous waste to a permitted treatment, storage or disposal facility (TSDF). The allowable accumulation time period depends on your generator status. As a generator, you are required to ship hazardous waste often enough to meet the generator accumulation limits that apply to your generator status. The time period starts from the date marked on the drum or tank known as the accumulation start date. Accumulation dates do not apply to CESQGs.



**Conditionally Exempt Small Quantity Generator (CESQG)** – No accumulation time requirements. Must not accumulate 1000 kilograms (2200 pounds) or more of hazardous waste (about five (55) gallon drums) or 1 kilogram (2.2 pounds) of acutely hazardous waste onsite at any one time.

**Small Quantity Generator (SQG)** – Must not accumulate hazardous waste for more than 180 days from the date on drum or tank (270 days if the generator must ship farther than 200 miles from the facility). Must not accumulate more than 6,000 kilograms (13,000 pounds) or about thirty (55) gallons drums) of hazardous waste onsite at any one time.

**Large Quantity Generator (LQG)** – Must not accumulate hazardous waste for more than 90 days from the date on drum or tank. A LQG has no quantity limits.

Note: Generator status is based upon the volume of hazardous waste that is generated in a calendar month and not on the amount of waste accumulated onsite. For example, a CESQG that exceeds the 2,200 pound onsite limit is subject to the SQG requirements until that volume of waste is shipped offsite, but is not a SQG.

## 6.7 Summary of Generator Requirement

### 6.7.1 Requirements for Conditionally Exempt Small Quantity Generators (CESQGs)

- Identifies all hazardous waste generated.
- Determines hazardous waste generator status.
- Generates no more than 100 kilograms (about 220 pounds or 25 gallons) of hazardous waste and no more than 1 kilogram of acutely hazardous waste in any calendar month.
- Obtains a site-specific generator E.P.A. ID number, if required.
- Accumulates no more than 1000 kilograms (about 2200 pounds or five (55) gallon drums of hazardous waste onsite at any one time.
- Accumulates no more than 1 kilogram (about 2.2 pounds) of acutely hazardous waste onsite at any one time.
- Maintains and operates their facility to minimize the possibility of fire, explosion or any unplanned release of hazardous waste.
- Treats hazardous waste on site or ensures delivery to an authorized disposal facility.  
*Note: Solid waste landfills are not allowed to accept any hazardous waste for disposal from CESQGs.*
- Uses a hazardous waste shipping manifest to ship CESQG hazardous waste (recommended).

- Attaches the final copy of the manifest to the original manifest copy (recommended). This final copy verifies delivery of hazardous waste to an authorized disposal facility.

#### 6.7.2 General Requirements for both SQGs and LQGs

General requirements common to both SQGs and LQGs are listed in this section. Requirements specific to SQGs and LQGs are listed in Sections 6.7.3 and 6.7.4 below.

- Identifies all hazardous waste generated.
- Determines your hazardous waste generator status.
- Obtains a site-specific generator E.P.A. ID number.
- Ensures hazardous waste is not disposed of improperly on the ground, to the sanitary sewer, storm drains, or into the municipal trash.
- Properly stores hazardous wastes and pays attention to the hazardous waste accumulation requirements for your generator status.
- Clearly labels each container with the words “Hazardous Waste”. Your hazardous waste transporter should be able to assist you in obtaining the correct hazardous waste labels. Hazardous waste labels and signs are available online at [www.cdphe.state.co.us/hm/complianceaids.htm](http://www.cdphe.state.co.us/hm/complianceaids.htm).
- Ensures containers and tanks of hazardous waste are in good condition and closed at all times unless filling or draining. Containers cannot be stored in a manner to cause a rupture or leak.
- Uses a licensed transporter to ship hazardous waste and ensures that the waste is shipped to an authorized disposal facility.
- Segregates incompatible wastes.
- Marks the date when accumulation began on all hazardous waste containers.
- Inspects storage areas weekly. Inspects containers for leaks, deterioration, and compatibility with the hazardous waste stored inside. Containers have adequate aisle space and be properly closed and labeled.
- Maintains a hazardous waste storage area or satellite accumulation area according to Figure 1 below.
- Uses a properly completed hazardous waste manifest when shipping hazardous waste offsite.
- Retains Land Disposal Restriction (LDR) forms, waste analysis data, manifests and other documentation for at least 3 years. (It is recommended that you keep these documents indefinitely).



### 6.7.3 Requirements for Small Quantity Generators (SQGs)

- Follows the General Requirements for both SQGs and LQGs in Section 6.7.2 AND:
- Generates more than 100 kilograms but less than 1,000 kilograms (between 220 and 2,200 pounds or between 25 and 250 gallons) of hazardous waste and no more than 1 kilogram (about 2.2 pounds) of acutely hazardous waste in any calendar month.
- Must not accumulate more than 6,000 kilograms (13,000 pounds or about thirty (55) gallons drums) onsite at any one time.
- Ships waste offsite within 180 days (270 days if the generator must ship waste farther than 200 miles from the facility) of the accumulation date on the tank or container. A one-time 30-day extension is available on a case-by-case basis.
- Receives a copy of the signed manifest from the designated disposal facility within 60 days of the waste being accepted by the transporter. If this copy is not received in 60 days, you must submit a legible copy of the manifest and indicate that the copy has not been received to the HMWMD.
- Prepares for emergencies in accordance with Section 6.9.
- Ensures that employees are provided with hazardous waste training including waste handling and emergency response procedures relevant to their job responsibilities. Documentation of training must be retained onsite for all current employees.

### 6.7.4 Requirements for Large Quantity Generators (LQGs)

- Follows the General Requirements above for both SQGs and LQGs in Section 6.7.2 AND:
- Generates 1,000 kilograms (about 2,200 pounds or about 250 gallons) or more of hazardous waste and/or more than 1 kilogram (about 2.2 pounds) of acutely hazardous waste in any calendar month.
- Submits a Biennial Report to the Colorado HMWMD by March 1 of each even numbered year or upon request. You must keep a copy of this report on file for at least three years.
- Ships waste offsite within 90 days of the accumulation start date on the tank or container. A one-time 30-day extension is available on a case-by-case basis.
- Has no limit on the quantity of hazardous waste stored onsite at any one time.
- Receives a copy of the signed manifest from the designated disposal facility within 35 days of the waste being accepted by the transporter. *If this copy is not received in 45 days, you must submit an exception report to the HMWMD.*
- Develops and maintains a formal written Emergency Response/Contingency Plan for the facility.
- Provides facility hazardous waste personnel with classroom and on-the-job training regarding hazardous waste requirements. Employees must receive training within six months of new or changed employment and receive annual refresher training thereafter.
- Creates a job title and description for each position at the site related to hazardous waste management and the name of the employee filling each job.

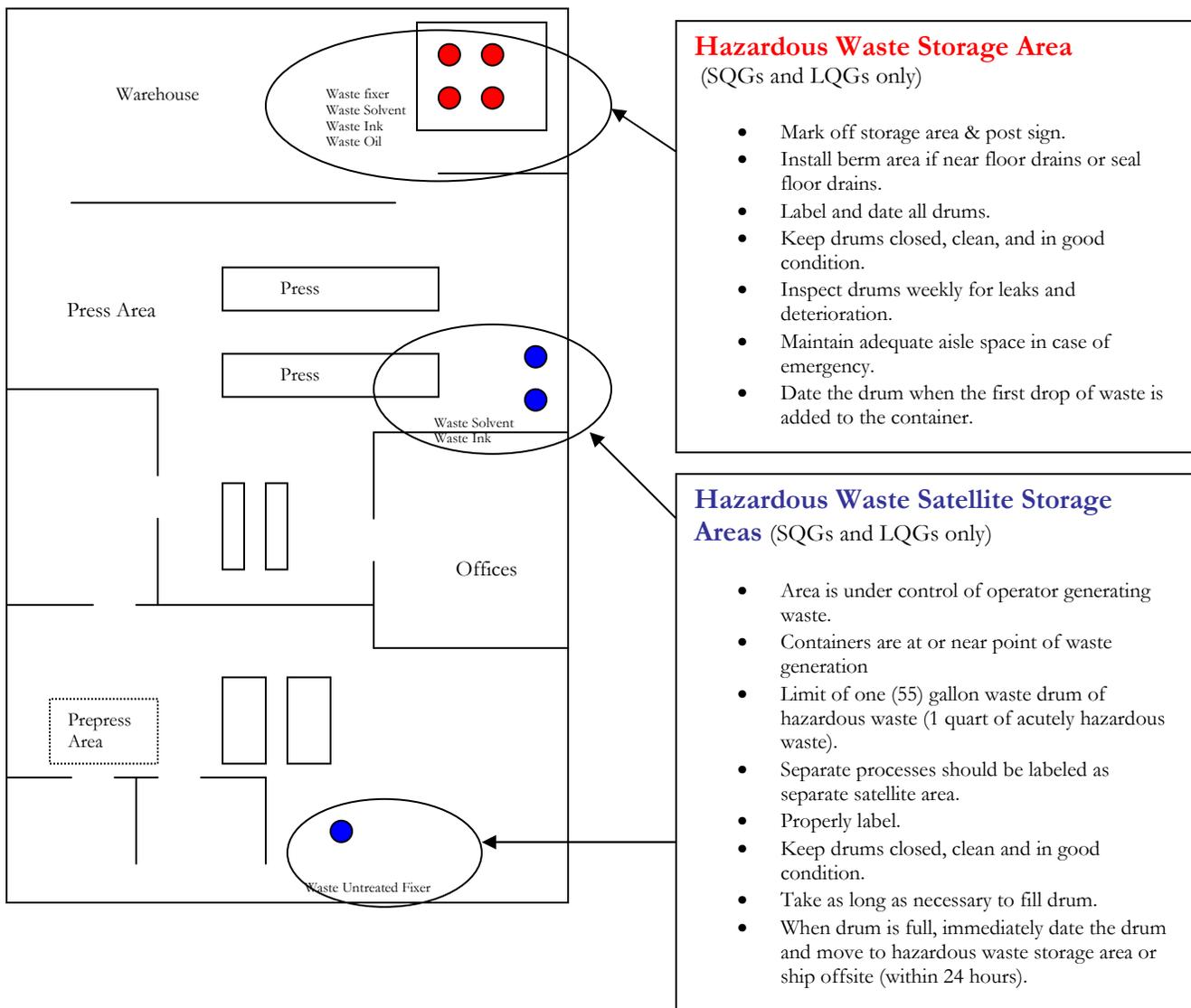
- Maintains records onsite for current personnel and past personnel employed within the last three years.

## 6.8 Hazardous Waste Storage Requirements

### 6.8.1 Requirements for Waste Storage and Satellite Accumulation Areas

Hazardous waste regulations allow you to store hazardous waste in a designated hazardous waste storage area and/or at or near workstations where the hazardous waste is generated. Waste storage areas at or near workstations are called Satellite Accumulation areas. Refer to Figure 1 for storage requirements for Hazardous Waste and Satellite Accumulation areas for SQGs and LQGs.

**Figure 1**



### 6.8.2 Storage of Hazardous Waste in Tanks

Specific requirements for storage of hazardous waste in tanks for SQGs and LQGs are listed in the “*Guide to Generator Requirements of the Colorado Hazardous Waste Regulations*”. This document is available online at [www.cdphe.state.co.us/hm/handbk.pdf](http://www.cdphe.state.co.us/hm/handbk.pdf). The requirements for a SQG are listed below. Refer to the Colorado hazardous waste regulations (6 CCR 1007-3, Section 265 Subpart J) for the complete listing of requirements for LQGs since they are too lengthy to include in this document.

### 6.8.3 Storage of Hazardous Waste in Tanks – Requirements for SQGs

- Label with the words, “Hazardous Waste”.
- Hazardous waste must not be accumulated in the tank(s) for more than 180 (270 days if the generator must ship waste farther than 200 miles from the facility).
- Precautions must be taken to prevent accidental ignition or reaction of ignitable or reactive wastes.
- Hazardous wastes or treatment reagents must not be placed in a tank if they could cause the tank or its inner liner to rupture, leak or corrode.
- Uncovered tanks must have two feet of freeboard (empty space at the top of the tank) or a spill containment that equals or exceeds the volume of the top two feet of the tank.
- Where hazardous waste is continuously fed into a tank, the tank must be equipped with a means to stop this inflow (e.g., a shutoff valve).
- The tank(s) must be inspected every day that the tank contains hazardous waste to detect leaks or corrosion. It is suggested that you keep a log of all inspections.
- Incompatible wastes must not be placed in the same tank or an unwashed tank that previously held an incompatible material.
- Contact your local fire department to determine if they have specific requirements for specific requirements for storage of hazardous waste in tanks.

## 6.9 Emergency Response Requirements

### 6.9.1 Emergency Response Requirements for SQGs and LQGs

- Operate and maintain your facility in a manner to minimize the possibility of fire, explosion or release of hazardous waste.
- Designate an Emergency Coordinator. The Emergency Coordinator must be onsite or on call for emergency response 24 hours a day. Employees must be familiar with and be able to identify the name of the Emergency Coordinator.
- Place a telephone or communication system near areas where hazardous waste is stored or generated to alert employees in case of an emergency.
- Post the following information by the telephone (SQGs). (Refer to Appendix C for an example).
  - Name and telephone number of the emergency coordinator.

- Telephone number of the fire department (unless your facility has a direct alarm).
- Location of fire extinguishers, spill control materials, and if present, the location of the fire alarm.
- Post evacuation route maps and exit signs in areas where hazardous wastes are handled or stored.
- Have portable fire extinguishers and/or water supply for fires. Ensure adequate water pressure for the sprinklers. (Adequate water pressure can be determined during the annual sprinkler test required by OSHA and the local fire department).
- Have facility communications or alarm systems, fire protection equipment, spill-control equipment, and decontamination equipment tested and maintained as necessary to assure its proper operation in case of emergency.
- Maintain adequate aisle space between containers and tanks to allow unobstructed movement in case of an emergency.
- Make arrangements for emergency response with local authorities (police, fire, local health departments, and hospitals).

### 6.10 Top Ten Hazardous Waste Violations

Top Ten Hazardous Waste Violations For Printers	
<input type="checkbox"/>	Failure to make a correct hazardous waste determination. This is most common for F-listed rags. However, it is also common for printers to call their blanket wash hazardous when it is not.
<input type="checkbox"/>	Improper disposal of hazardous waste. This violation typically results from the failure to make a correct hazardous waste determination. Failure to recognize a hazardous waste leads to the improper disposal of that waste.
<input type="checkbox"/>	Failure to post emergency response information by the telephone (SQG).
<input type="checkbox"/>	Failure to provide hazardous waste training (SQG and LQG).
<input type="checkbox"/>	Failure to properly label containers of hazardous waste with the words "Hazardous Waste" (SQG and LQG).
<input type="checkbox"/>	Failure to properly mark containers of hazardous waste with an accumulation start date (SQG and LQG).
<input type="checkbox"/>	Failure to keep containers of hazardous waste closed except for when it is necessary to add or remove waste from the container
<input type="checkbox"/>	Failure to conduct weekly inspections of areas that are used for accumulation of hazardous waste (LQG and SQG).
<input type="checkbox"/>	Failure to develop a complete contingency plan (LQG).
<input type="checkbox"/>	Failure to provide annual hazardous waste refresher training (LQG).



---

## 7.0 Other Wastes

---

### 7.1 Used Oil

Printing operations typically generate used oil from operating and maintenance processes. There are specific requirements for the storage and transport of used oil. The requirements for used oil are outlined in the document, "Guide to Generator Requirements of the Colorado Hazardous Waste Regulations". A summary of these requirements is listed below:

- Containers and tanks used to store used oil must be in good condition, not leaking, and labeled with the words "Used Oil".
- Containers of used oil stored outdoors must be kept closed and properly labeled.
- Used oil must be shipped offsite by transporters who have obtained an EPA identification number unless you self-transport less than 55 gallons of your facility's used oil to a used oil collection center.
- Mixtures of used oil and listed hazardous waste (e.g., F-listed hazardous wastes) are subject to regulation as hazardous waste rather than used oil.
- Mixtures of used oil and characteristic hazardous waste that do not exhibit the characteristic are regulated as used oil (e.g., hazardous waste that is ignitable but does not demonstrate this characteristic in the used oil mixture).
- Mixtures of used oil and conditionally exempt small quantity generator hazardous waste are regulated as used oil.
- Mixtures of used oil and non-hazardous solid waste are regulated as used oil if the mixture will be burned for energy recovery.
- Mixing used oil and hazardous waste with the purpose of managing it as used oil could be considered treatment and may be subject to permitting requirements.
- Develop a spill clean up plan that outlines how you will stop the release of used oil to the environment in the event of an accident. If you have a release and are not subject to the requirements of State and Federal storage tank reporting requirements, you should:
  - Stop the release;
  - Contain the released used oil;
  - Clean up and manage the released used oil, and;
  - Take measures to prevent future spills or leaks.

## 7.2 Universal Waste

Colorado has adopted streamlined hazardous waste management regulations that govern the collection and management of “universal wastes”. Universal waste regulations reduce the management requirements for certain wastes to encourage recycling and proper disposal.

### 7.2.1 List of Universal Wastes

- Waste batteries (except lead acid batteries)
- Certain pesticides
- Mercury-containing devices (the elemental mercury must be housed within an outer metal, glass or plastic casing)
- Aerosol cans that contain hazardous waste when discarded
- Lamps or the bulb or tube portion of an electric lighting device
- Electronic devices and components derived from the disassembly of electronic devices (e.g., computers, cell phones, monitors, televisions, etc.)

### 7.2.2 Requirements for Small Quantity Handlers of Universal Waste

- Accumulates less than 5,000 kilograms (about 11,000 pounds) of universal waste (the total of all types of universal waste on-site at any one time).
- Accumulates universal waste for no longer than one year unless it is necessary to do so to facilitate proper recovery, treatment or disposal (you must be able to prove it was necessary). You must be able to demonstrate accumulation times.
- Prohibited from on-site disposal or treatment (except as provided in the Colorado Hazardous Waste Regulations under 6 CCR 1007-3, Section 273.11).
- Not required to notify the Colorado Department of Public Health and Environment of universal waste management activities.
- Manages universal waste in a manner to prevent releases to the environment.
- Labels or marks the universal waste or the container with “Universal Waste – *type of waste*” or “Waste – *type of waste*” or “Used – *type of waste*”.
- Trains all employees who handle or manage universal waste on proper handling and emergency procedures appropriate to the types of universal waste handled.
- Immediately contains all releases of universal wastes. If the release is hazardous waste, it must be managed as such.
- Ships to an authorized facility e.g., another universal waste handler, a permitted hazardous waste treatment, storage and disposal (TSD) facility, a legitimate recycler or a foreign destination. It is recommended (but not required) that records of universal waste shipments be kept.

### 7.2.3 Requirements for Large Quantity Handlers of Universal Waste

- Accumulates more than 5,000 kilograms (about 11,000 pounds) of universal waste (total of all types of universal waste) on-site at any one time.
- Retains “Large Quantity” designation through the end of the calendar year in which the 5,000 kilogram limit is met or exceeded.
- Prohibited from on-site disposal or treatment of universal waste except as provided in 6 CCR 1007-3, Section 273.12.
- Manages universal waste in a manner to prevent releases to the environment.
- Labeling, accumulation time limits, training, responses to releases and off-site shipping requirements are the same as a Small Quantity Handler of Universal Waste (refer to Section 7.2.2 above).
- Records of universal waste shipments must be maintained for at least three years.

### 7.3 Reusable Rags, Shop Towels and Absorbents

Rags, shop towels, and other reusable absorbents that are contaminated with listed hazardous waste or that exhibit a hazardous waste characteristic are considered to be exempt from the provisions of the Colorado hazardous waste regulations if they are picked up, cleaned, and delivered back to your printing shop by a laundering service that uses a solvent-based dry cleaning process to clean the rags or a water-washing commercial laundry with all appropriate waste water discharge permits from the local municipal wastewater treatment plant. Commercial dry cleaning is preferred because this process enables recovery and destruction of the contaminants removed during the dry cleaning process. Materials contaminated with solvents, resins, lacquers, etc., cleaned in commercial water-washing facilities are simply transferring the contaminants to the water, which is discharged to the sanitary sewer. The water is then treated by the municipal wastewater treatment facility. Laundering may be done at your facility only with the written approval of the local sewer district. Reusable absorbent materials cleaned by such contractual/closed loop cleaning services would not have to be managed as hazardous waste when on site; 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. A copy of the current laundering contract should be maintained in your operating files.



Safe handling and storage of the shop towels and reusable absorbents is your responsibility. They must be stored in sealed and labeled waste containers. The rags and wipes are not exempt from the hazardous waste regulations if free liquid hazardous waste is dumped onto the absorbents or if the absorbents are saturated with free liquid hazardous wastes. One way to ensure that no free liquids are present is to wring out the soiled materials and collect the released liquid for proper hazardous waste handling and disposal. If you are unsure as to the type of waste involved, you should make a hazardous waste determination prior to disposal.



### 7.4 Aerosol Cans

Aerosol cans that are still in use or that contain useable product are not yet considered wastes. Aerosol cans that are empty or that contain materials that are not considered hazardous wastes may be managed as solid waste and can be recycled or sent to a solid waste landfill. You are responsible for determining if



your aerosol cans are hazardous. Sometimes aerosol products must be discarded before they are completely empty e.g., the spray mechanism no longer operates, the propellant is spent, or the product is no longer used. The contents remaining in an aerosol can would not be considered spent and therefore could not carry the F-codes for spent solvents. They may, however, carry a P- or U-code for unused chemical products. If your facility uses a lot of aerosol cans, you may want to purchase a crushing device that punctures and crushes the cans for recycling, expelling the liquid product into a sealed container that is properly labeled for disposal. If the aerosol cans contain a hazardous waste, you may choose to manage them with the reduced requirements for Universal waste (Section 7.2) or as a hazardous waste (Section 6.0). Managing aerosol cans as universal waste is most beneficial to small and large quantity generators of hazardous waste or CESQGs that would otherwise be small quantity generators if they did not manage some of their wastes as universal wastes.

## 7.5 Lamp Wastes

Many commonly used lamps contain small amounts of mercury and other metals. Such lamps include fluorescent, compact fluorescent, high-pressure sodium, mercury vapor and metal halide lamps. Used lamps are considered a hazardous waste if the material exhibits the characteristic of toxicity for these metals.

According to the U.S. EPA, testing of burned-out fluorescent lamps showed that a high percentage of the lamps tested exhibited the toxicity characteristic for metals, particularly mercury.



Non-residential sources like printing operations must determine if their lighting wastes are hazardous wastes. If, using the Toxicity Characteristic Leaching Procedure (TCLP) test, the extract from a representative sample of the waste contains mercury at a concentration greater than or equal to the maximum contaminant concentration of 0.2 ppm (mg/l), the lamps would be hazardous waste. This waste would carry the hazardous waste code D009. Many mercury-containing lamps also contain elevated levels of lead and may exhibit the toxicity characteristic for lead (TCLP > 5 ppm lead). Such wastes would also carry the hazardous waste code D008. Your business must follow Colorado's Universal or hazardous waste regulations for proper management and disposal applicable to your generator category. If the lighting wastes have not been tested to show that they are not hazardous, or if the generator doesn't have other supporting data, then the generator should assume the lamps are hazardous and manage them as Universal or Hazardous waste. The generator may use data obtained from the manufacturer, other generators, or published studies to assist with their hazardous waste determination.

Several lighting manufacturers now produce toxicity test-compliant versions of their products. Testing done by the manufacturers demonstrates that these lamps do not tend to fail the toxicity test for metals and can therefore be managed as non-hazardous solid waste or as Universal waste. Toxicity test-compliant lamps are clearly marked with either green printing or green end caps to distinguish them from other lighting products. Mercury-containing lighting wastes from non-residential sources that do not fail the toxicity test may be disposed of in a properly managed municipal solid waste landfill, handled as Universal Waste or sent to a legitimate lamp recycler. Landfills and recyclers may impose their own restrictions to regulate incoming wastes in accordance with local rules or company guidelines. Municipal solid waste landfills in Colorado are not permitted to accept any quantity of non-residential hazardous waste for disposal.

## 7.6 Batteries

### 7.6.1 Lead Acid Batteries

In printing operations, batteries are most frequently used in universal power supplies, forklifts, delivery trucks, and other vehicles. Each battery contains about 18 pounds of lead and one gallon of highly corrosive sulfuric acid electrolyte solution. Smaller sealed lead-acid batteries are used in computers and cellular telephones and are managed differently. Management of vehicle-type batteries are specifically addressed in the Colorado Hazardous Waste regulations (6 CCR 1007-



3 Section 267 Subpart G). A battery is “reclaimed” if it is processed to recover the lead and sulfuric acid solution. If your printing operation regenerates spent lead-acid batteries by recharging them or replacing the electrolyte solution, and/or you generate, transport, collect, or store spent lead-acid batteries but *do not reclaim them*, you are not subject to the hazardous waste regulations (6 CCR 1007-3 Section 267.8(a)). You are responsible for storing the batteries in a way that prevents releases of hazardous chemicals to the environment and to ultimately send them to a legitimate recycling facility or permitted hazardous waste disposal facility. Lead-acid batteries need not be labeled and can be stored on a pallet until picked up for recycling.

#### 7.6.2 Other Batteries

If you don’t already have one, your company should consider developing a battery-recycling program. Mercury-oxide, silver-oxide, and Ni-Cad batteries are the most easily recycled batteries due to metals recovery. Batteries such as high mercury alkaline and carbon-zinc, zinc-air, and lithium contain smaller amounts of metals are not as readily recycled.



NiCad, silver-oxide, mercury-oxide, lithium ion, zinc-air, zinc-carbon, nickel metal hydride, sealed lead-acid and some alkaline batteries used in printing operations for pagers, cell phones, and computers are hazardous wastes when disposed of. Silver-oxide, mercury-oxide, zinc-air, and many zinc-carbon batteries can contain significant amounts of mercury. NiCad batteries contain 10-15% cadmium per cell, while lithium batteries may be reactive characteristic wastes. Battery identification is important in determining if it is hazardous and in selecting the proper disposal method. It is a good management practice to keep the packaging materials for batteries and to minimize the variety of batteries purchased to simplify identification and management of battery wastes. If you have determined that your batteries are hazardous waste because they contain heavy metals and corrosive solutions, do not dispose of them in the trash. Store them safely in an area protected from extreme temperatures until you are able to dispose of them properly. Each battery should be labeled as “Waste Battery”, “Used Battery” or “Universal Battery” or put into an accumulation container that is in good condition. If the batteries are placed into a container, only the container needs to be labeled. If these batteries are not recycled, they must be managed and disposed of as Universal waste (refer to Section 7.2) or hazardous waste (Section 6.0). Guidance for handling and disposal or recycling of batteries is available online at [www.cdphe.state.co.us/hm/battery.pdf](http://www.cdphe.state.co.us/hm/battery.pdf).

### 7.7 Computer and other Electronic Wastes

Electronic equipment like computer monitors, central processing units (CPUs), scanners, and cell phones contain a number of hazardous constituents such as lead, mercury, arsenic, cadmium, chromium and silver. Many of these constituents are found on the circuit boards or in the glass. CPUs also contain a battery such as nickel-cadmium, lithium or sealed lead acid. These constituents are not a concern while the equipment is in use, but if disposed of in a landfill, harmful chemicals could leach out and contaminate groundwater and soil.



Disposal of waste electronics from your business is regulated as hazardous waste in Colorado. The most recent data available demonstrates that cathode ray tubes (CRTs) from color monitors and color televisions consistently exceed the regulatory limit for lead. As a result, color monitors and color televisions from your business that are destined for disposal must be managed as Universal waste (Section 7.2) or Hazardous waste (Section 6.0), unless you have tested your equipment to show that it is not hazardous or if you have other supporting data from the manufacturer. Monochrome monitors (amber, green or black and white) do not contain significant amounts of lead or other metals because of the way they were manufactured; therefore, you can dispose of monochrome monitors into a dumpster although recycling of electronic wastes should become a part of your sustainable business practices.

The state of Colorado strongly encourages the reuse, refurbishment, or disassembly for materials recovery (collectively called “recycling”) of end-of-life computer equipment instead of disposal of these materials. More information on computer and electronic waste is available online at [www.cdphe.state.co.us/hm/electronics/index.htm](http://www.cdphe.state.co.us/hm/electronics/index.htm).



---

## 8.0 Air Emissions

---

Printing facilities typically emit air pollutants that are regulated by the Colorado Department of Public Health and Environment Air Pollution Control Division (APCD). Depending on the type and amount of air pollutants emitted, your company may have to report your air emissions or obtain an air permit. It is important that you make this determination prior to start up of your printing operations because you cannot operate without a valid Air Pollutant Emission Notice (APEN) or air permit, if required (refer to Section 8.1). Emissions of volatile organic compounds (VOCs) constitute approximately 98 to 99 percent of all releases in the printing industry. Some of these VOCs are also hazardous air pollutants (HAPs). Other potential air emissions for the industry are listed in this section.

Volatile organic compounds (VOCs) are chemicals that contribute to the formation of ground-level ozone, a component of smog by evaporation from chemicals used in the printing and other industries. Although ozone is needed in the upper atmosphere, in the lower atmosphere, ozone contributes to air pollution and can impact public health. Specific reporting requirements for VOCs are outlined in Colorado Regulation No. 3 and Regulation No. 7. These regulations are available online at [www.cdphe.state.co.us/ap/regoverview.html](http://www.cdphe.state.co.us/ap/regoverview.html).

Hazardous air pollutants (HAPs) are compounds that have been included on the Environmental Protection Agency’s (EPA) list of 188 chemicals that can have detrimental effects on humans and the environment. The list of HAPs regulated by EPA and Colorado and the method for identifying HAP reporting thresholds is maintained in Colorado Regulation No. 3, Appendix A and B. The HAP list is available online at [www.cdphe.state.co.us/ap/regoverview.html](http://www.cdphe.state.co.us/ap/regoverview.html) and is included in Appendix D of this workbook.

The most significant sources of VOC emissions in printing activities result from evaporation of the fountain and cleaning solutions that are used in the pressrooms. Solvent-based lacquers and adhesives can also be a significant source. Other sources include binding, coating and drying operations and ink storage and mixing.

Negligibly Reactive VOCs (NRVOCs) such as acetone, methylene chloride, methyl acrylate, t-butyl acetate, and 1,1,1-trichloroethane are among chemicals not regulated as VOCs because they contribute little to ozone formation in our lower atmosphere (limited photochemical reactivity). NRVOCs should not be included in your VOC emission calculations although they still could be reportable as HAPs. The list of NRVOCs can be found in the Colorado Common Provisions Regulation, 5 CCR 1001-2 at [www.cdphe.state.co.us/regulations/airregs/100102aqcccommonprovisionsreg.pdf](http://www.cdphe.state.co.us/regulations/airregs/100102aqcccommonprovisionsreg.pdf). The NRVOC list is included in Appendix D of this workbook.

Printing facilities may have boilers, heaters, press dryers and air pollution control equipment such as a thermal oxidizer to produce heat for certain processes. Combustion of fossil fuels like natural gas and fuel oil produce criteria pollutants such as nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter. Emissions from this type of equipment may be reportable and should be considered when reviewing potential air emissions from your printing operations.

Paper slitting, folding and cutting operations generate particulate matter (paper dust). These particulate emissions can be released from combustion of fuel from press dryers and from press materials as they pass through the dryer. Particulate emissions from these operations are minimal and are not typically reportable air emissions because they are not released to the atmosphere outside of the building.

Add-on particulate control equipment such as a baghouse and/or cyclone that are ducted outside are reportable in Colorado.

### 8.1 Air Pollutant Emission Notices (APENs)

In Colorado, if your printing facility has or will be emitting air pollutants above certain reporting levels (in tons per year), you are required to submit an Air Pollutant Emission Notice (APEN) to the Colorado Air Pollution Control Division (APCD). Table 3 outlines the APEN and Permit reporting levels for VOCs and other air pollutants. Printing facilities in areas designated as being in attainment for ozone in Colorado can follow the less stringent reporting requirements. Facilities located in areas designated as being in non-attainment for ozone (out of compliance with the National Ambient Air Quality Standards or NAAQS for ozone) will be required to follow the more conservative reporting levels as outlined in Table 4.

On November 20, 2007, the Denver-metropolitan and North Front Range areas of Colorado were designated by the EPA as non-attainment for ozone (VOCs and Nitrogen oxides as precursor pollutants that cause ozone formation). The nine-county area known as the 8-hour ozone nonattainment area includes the counties of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Larimer, Jefferson, and Weld. A chronology of attainment status in Colorado and a map of the attainment and non-attainment areas is available in Appendix D of this workbook. The map is also available online at [www.cdphe.state.co.us/ap/images/ozoneareamap.gif](http://www.cdphe.state.co.us/ap/images/ozoneareamap.gif).

**Table 4**

APEN AND PERMIT REPORTING LEVELS FOR ATTAINMENT AND NONATTAINMENT AREAS				
	APEN		PERMIT	
Pollutant Category	Attainment (tons per year)	Nonattainment (tons per year)	Attainment (tons per year)	Nonattainment (tons per year)
Volatile organic compounds	2	1	5	2
PM-10 and PM-2.5	2	1	5	1
Total suspended particulates	2	1	10	5
Carbon monoxide	2	1	10	5
Sulfur dioxide	2	1	10	5
Nitrogen oxides	2	1	10	5
Lead	100 pounds per year	100 pounds per year	200 pounds per year	200 pounds per year
Other criteria pollutants <sup>1</sup>	2	1	5	2
Non-Criteria Pollutant (HAPs and other reportable air pollutants)	De Minimis Level (Determined Using Procedures in Regulation 3, Appendix A)	De Minimis Level (Determined Using Procedures in Regulation 3, Appendix A)		

APEN reporting thresholds are listed in Regulation No. 3, Part A, II.B.3. If your calculated emissions meet or exceed the thresholds listed above, you must submit the form titled, *“Print Shops, Air Pollutant*

*Emission Notice (APEN) and Application for Construction Permit*”, to report your air emissions. Emission sources include both individual pieces of equipment (e.g., generators) and activities that release emissions (e.g., printing presses and solvent cleaning processes). Printers typically submit one APEN for facility emissions of VOCs and HAPs and a separate APEN for each piece of equipment such as a generator, oven, or boiler.

Once the APEN has been submitted to the Air Division, it is generally valid for five years assuming no changes in processes, emissions, control equipment, work practices or ownership. You must list current equipment associated with your air emissions when you file the APEN form (e.g., presses, control equipment). If equipment changes, you must notify the Division in writing of the change(s). If your air permit allows, you may be able to submit a new equipment list in lieu of submitting a revised APEN and fee if the reportable air emissions have not changed from the last APEN submitted and air emissions are below current air permit limits. This condition must be specifically listed in your air permit.

A new fully completed APEN form and the associated filing fee must be submitted to the Air Division at least 30 days before expiration of the five-year term on the current APEN. It is important to keep the APEN(s) for your printing shop up to date. If the APEN for your facility is more than five years old, your equipment has changed, your emissions have increased or your facility is operating under a new name or new ownership, it may be time to submit a new APEN (and modify your air permit if applicable), regardless of the five year term.

The Air Division will use the information provided in the APEN to determine if an air permit is required. If a permit is required, the APEN will become part of the permit application package.

Certain categories of sources are exempt from APEN requirements because the emissions from those sources are considered to have very little impact on air quality. Exempt sources are listed in Regulation 3, Part A, II.D. This regulation is available online at [www.cdphe.state.co.us/regoverview.html](http://www.cdphe.state.co.us/regoverview.html). If you are not certain whether you have emissions or equipment that is exempt from APEN or air permit requirements or have questions regarding your APEN or air permit, contact the Small Business Assistance Program.

Remember, your goal, as a “green printer” is to eliminate the use of environmentally harmful products and/or generate the least amount of pollution. To do this, evaluate the products you use and determine if there are alternative products that could be used to reduce or eliminate VOC, HAP and other air pollutant emissions in your operations. Then determine if a change to alternative products is feasible for your business and can help you attain your Sustainable Management System (SMS) objectives and targets.

## 8.2 Non-Criteria Reportable Addendum form (HAP Reporting)

Reporting thresholds for hazardous air pollutants (HAPs) are determined using the procedures outlined in Regulation No. 3, Appendix A. These procedures allow you to determine your reporting levels based on the “scenario” that best fits your printing operations. To determine which scenario to use for reporting, you must measure the distance (height) from the air pollutant release point to ground or the distance (length) from the release point to your property boundary. Once you have determined a distance, you choose the scenario that best fits from Regulation No. 3, Appendix A and report HAPs emitted from your facility if they exceed the reporting levels outlined for that scenario. Printing facilities typically use Scenario 1 to determine reporting levels since it is the most conservative (e.g., release point is measured as less than 10 meters or distance to property boundary is less than 100 meters). The list of HAPs and the method for identifying HAP reporting levels is outlined in Colorado Regulation No. 3, Appendix A and B. These appendices are available online at [www.cdphe.state.co.us/ap/regoverview.html](http://www.cdphe.state.co.us/ap/regoverview.html) and are included in Appendix D of this document. If your business has reportable HAPs, you must complete the form titled, “*APEN Addendum for Non-Criteria Reportable Pollutants*” and submit this form with the APEN form and APEN filing fee.

Most printing facilities in Colorado are not subject to the federal standards for HAPs such as the National Emission Standards for Hazardous Air Pollutants for the Printing and Publishing Industry, Subpart KK, because they emit less than 10 tons per year of each regulated HAP or 25 tons per year of any combination of HAPs. If you have questions about federal standards that might apply to your facility, contact the Small Business Assistance Program.

### 8.3 Air Permits

Air emissions at your printing facility may trigger the need for an air permit (called a “Construction Permit”) due to the level of air pollutants emitted. In Colorado, a Construction Permit is required before you begin construction of a new source or modification of an existing one if uncontrolled actual emissions from this source exceed any of the permit reporting levels outlined in Table 4 above.

Permit reporting thresholds are listed in Regulation No. 3, Part B, II.D.3. Some sources are exempt from obtaining permits similar to filing APENs. Permit exempt sources are listed in Regulation 3, Part B, II.D.1. A list of these exemptions is available online at [www.cdphe.state.co.us/ap/regoverview.html](http://www.cdphe.state.co.us/ap/regoverview.html). None of the exemptions apply if a source would otherwise be subject to any specific federal or state requirement such as the National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Printing and Publishing Industry, Subpart KK (applicable to major sources only). If you are unsure whether a source at your shop is exempt from obtaining an air permit, contact the Small Business Assistance Program.

In Colorado, air permits are issued in two phases:

- **Initial Approval and Final Approval.**

An **Initial Approval** air permit allows your printing facility to be constructed and begin operation. Under most circumstances, if your business is already operating and you determine that you may need an air permit (for example, you have expanded your printing operations), you will also receive an Initial Approval permit after submitting the APEN. You should review the Initial Approval permit conditions to make sure you can comply with them.

A **Final Approval** permit is issued after your company certifies that you are in compliance with the conditions of the Initial Approval permit. The owner must submit the final approval self-certification form entitled, “Air Pollution Control Division Construction Permit Final Approval Self-Certification Form”, to the Air Division within six months (180 days) of start up of operations or within six months of the date the Initial Approval permit is issued.

Your air permit defines the type of air pollution control measures that will be used, sets air pollutant emission limits (such as VOC and HAP emission limits), requires you to mark the air permit number on each piece of equipment subject to the air permit, includes recordkeeping requirements and may include additional requirements. Take the time to review your air permit and be familiar with your regulatory requirements. More information on the air permitting process can be found in the guidance document, “*Reporting Your Air Emissions and Applying for Air Permits Step-by-Step for Colorado Small Businesses.*” This document is available online at [www.cdphe.state.co.us/ap/down/permittingstepbystep.pdf](http://www.cdphe.state.co.us/ap/down/permittingstepbystep.pdf).

### 8.4 Reasonably Available Control Technology (RACT)

Colorado Regulations No. 3 and No. 7 require new and modified sources in non-attainment areas to reduce air emissions using Reasonably Available Control Technology (RACT). The U.S. EPA defines RACT as the “lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility”. In the Denver-Metropolitan/North Front Range ozone non-attainment area, all new and modified sources having emissions of VOC  $\geq$  2 tons per year or nitrogen oxides (NOx)  $\geq$  5 tons per year are required to

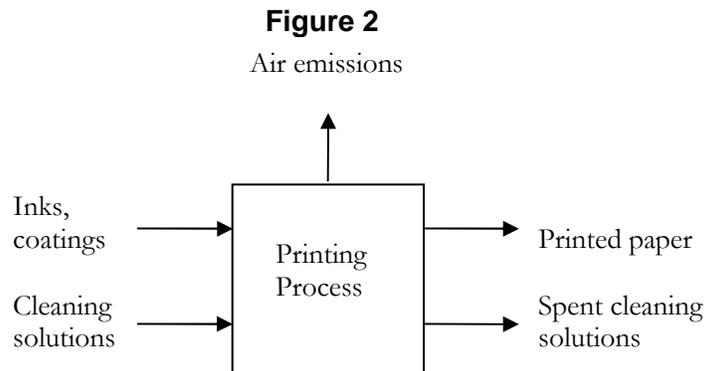
complete a RACT analysis. If your facility is a new or modified source of VOC or NO<sub>x</sub> emissions in a non-attainment area, you are required to research and submit options available to your business to reduce VOC and NO<sub>x</sub> emissions, and submit that RACT analysis with your air permit application. Examples of RACT for printing operations may include, but are not limited to, the use of low VOC inks, coatings and cleaners or add-on control equipment such as a thermal oxidizer. The U.S. EPA provides insight on what RACT may be for certain types of operations in published Control Technique Guidelines or CTGs (refer to Section 8.5 for specific CTGs for printing operations). However, the final RACT determination may differ from the U.S. EPA's published CTG. Note that RACT may be a change in work practice, use of a control device or no change in operations at all depending on the cost per amount of pollutant reduced. The Air Pollution Control Division will review the RACT analysis, make a determination on what RACT is for your operation and incorporate those requirement(s) into your air permit. The burden is on you to provide the RACT options for APCD approval.

## 8.5 Control Technique Guidelines (CTG)

The U.S. EPA developed Control Technique Guidelines (CTG) to provide state and local air pollution control authorities information to assist them in determining RACT for VOCs from specific source categories. In September 2006, the EPA issued two CTGs for the printing industry: 1) Control Technique Guidelines for Offset Lithographic Printing and Letterpress Printing and 2) Control Technique Guidelines for Flexible Package Printing. The CTG guidelines are available online at [www.epa.gov/ttn/caaa/t1ctg.html](http://www.epa.gov/ttn/caaa/t1ctg.html). A summary of the CTG for Offset Lithographic Printing and Letterpress Printing is available online at [www.cdph.state.co.us/ap/stationarylibrary.html](http://www.cdph.state.co.us/ap/stationarylibrary.html). If you are a new or modified source in the Denver-Metropolitan/North Front Range ozone non-attainment area, the APCD may use information from the CTGs to determine your RACT requirements. These requirements will be listed in your air permit.

## 8.6 Estimating VOC Emissions

The simplest method to estimate VOC emissions from a printing facility is using the **mass balance approach**. This method assumes that all of the volatiles in inks, coatings, and cleaning solutions are emitted into the air. Essentially, what goes in must come out. Refer to Figure 2 below.



To use the mass balance approach, you must know how many pounds (lbs) of VOC are in a gallon of coating or other product and the total gallons of coating used during the year. The VOC content in the coating should be available from the coating supplier in a Material Safety Data Sheet (MSDS) or Technical Data Sheet or by direct measurement using a sampling method such as the U.S. EPA Method 24.

**Steps:**

1. Calculate the annual emission of VOCs by multiplying the VOC content of the coating by the annual usage rate of the coating or other product.

$$\text{Pounds of VOC/gallon of coating} \times \text{gallons of coating used/year} = \text{pounds of VOC emitted/year}$$

A proper MSDS should list the VOC content of a coating in terms of percent by weight and provide the density of the coating or list the VOC content in terms of weight of VOC per gallon (lb/gal) of coating.

If the MSDS or other resource lists the VOC content in grams/liter, divide the weight of the VOC in grams/liter by 119.86 (1 pound = 454 grams and 1 liter = 0.264 gallons).

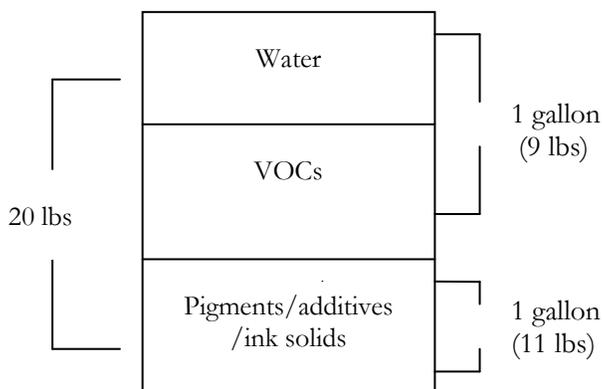
$$\text{VOC content (lbs/gal)} = \text{VOC content (grams/liter)} \times 1 \text{ pound}/454 \text{ grams} \times 1 \text{ liter}/0.264 \text{ gal}$$

2. Understand the difference between “Percent by Weight” and “Percent by Volume”.

Sometimes calculation of the pounds of VOC per gallon of coating requires using the provided ingredient percentages. The MSDS may list ingredients in terms of *percent by weight* or *percent by volume*. It is important to make sure you pay attention to the units. An example of each is provided in Figure 3 below.

**Figure 3**

<b>% by Volume Water &amp; VOCs</b>	$\frac{1 \text{ gal}}{2 \text{ gal total}} \times 100 = 50\% \text{ by volume}$
<b>% by Volume Ink Solids</b>	$\frac{1 \text{ gal}}{2 \text{ gal total}} \times 100 = 50\% \text{ by volume}$
<b>% by Weight Water &amp; VOCs</b>	$\frac{9 \text{ lbs}}{20 \text{ lbs total}} \times 100 = 45\% \text{ by weight}$
<b>% by Weight Ink Solids</b>	$\frac{11 \text{ lbs}}{20 \text{ lbs total}} \times 100 = 55\% \text{ by weight}$



3. Calculate the VOC Content of the Coating as emitted.

- If the ingredients are listed in “percent by weight”:

Multiply the percent by weight of the VOC in the coating by the density of the coating.

$$\text{Pounds VOC/gallon of coating} = (\% \text{ by weight VOC} / 100) \times (\text{density of coating [pounds/gallon]})$$

- If the ingredients are listed in “percent by volume”:

- a. Calculate the pounds of each VOC in a gallon of coating

$$\text{Pounds VOC1/gallon of coating} = (\% \text{ by volume of VOC1}/100) \times (\text{density of VOC1 [pounds/gallon]})$$

- b. Calculate the pounds of Total VOC in a gallon of coating

$$\text{Total pounds VOC/gallon of coating} = (\text{VOC1 lbs/gal} + \text{VOC2 lbs/gal} + \text{VOC3 lbs/gal} + \dots)$$

4. If the ingredients are reported in ranges (e.g., 1-5%), use the upper range in the calculation (e.g., 5%). When estimating emissions, it is best to be conservative and the upper range represents the worst case. It is possible, using this approach to end up with a calculation showing that more than 100% of the coating is VOC. If this occurs, use only 100%.
5. If density is not provided, the specific gravity of the coating is used to calculate the density. To calculate density using specific gravity, multiply the specific gravity of the coating by the density of water (8.34 lbs/gallon).

$$\text{Specific Gravity of Coating} \times 8.34 \text{ lbs/gallon} = \text{Density of Coating}$$

6. For ink and coating VOC content, you can determine the VOC emissions for individual inks used or use the highest VOC containing ink in each product category. This can save a lot of time and effort since typically the only difference between many inks and coatings is the pigment.
7. Use the following VOC release factors (Table 5) for Offset Lithography and Letterpress printing. VOC release factors are taken from the final U.S. EPA Control Technology Guideline (CTG) for Offset Lithographic and Letterpress Printing, September 2006.

$$\text{Total pounds VOC/gal of ink or cleaning solution} \times \text{release factor} = \text{lbs of VOC (without considering controls)}$$

**Table 5**

Product Category	VOC Release Factor	Comments
Heatset Inks	.80	20% Retention
Sheetfed/Nonheatset web inks	.05	95% Retention
Cleaning Solution	.50	Vapor pressure less than 10 mm of mercury (Hg) at 68°F (20°C), shop towels must be kept in closed containers.

8. To convert to tons per year, divide the pounds of VOCs by 2,000 (1 ton = 2000 pounds) to yield actual uncontrolled VOC emissions in tons per year. Keep uncontrolled emissions (no control device such as an oxidizer) separate from controlled emissions. Refer to the example in Table 6.
9. If your facility has control equipment (such as a thermal or catalytic oxidizer), the actual uncontrolled emissions can be multiplied by a control factor. You can calculate the control factor by subtracting the % control efficiency (decimal format) from 1. Control efficiencies may be listed on the equipment, in the equipment documentation, or by contacting the equipment supplier.

$$\text{Controlled VOC emissions (lb)} = \text{Total uncontrolled VOC emissions} \times (1 - \text{control efficiency})$$

10. Total VOC emissions are the result of adding all of the individual VOC emission determinations together and determining if your business must file an Air Pollutant Emission Notice, obtain an air permit or demonstrate that your facility is in compliance with a current air permit.

**Table 6**  
VOC Emission Calculation Worksheet - Example

Product	Usage	Units	VOC Content	Units	Release Factor	VOC Emissions (Uncontrolled)	Control Efficiency	VOC Emissions (Controlled)	
Non H/S Ink	25,000	lb/year	0.35	% By Weight	0.05	437.5		0.0	
Fountain Solution	420	gal/year	0.72	Lb/gal	1.0	302.4		0.0	
FS Additive	120	gal/year	6.7	Lb/gal	1.0	804.0		0.0	
Cleaning Solution	1200	gal/year	6.24	Lb/gal	0.5	3,744.0		0.0	
Total						5,287.9			
H/S Ink	20,000	lb/year	0.40	% By Weight	.80	6,400.0	.10 (1-.90) with oxidizer	640.0 lb/year	
<b>TOTALS</b>									
Total Uncontrolled	5,287.9 lb/year + 6,400.00 lb/year = 11,687.9 divided by 2000 lb/ton = Uncontrolled Actual air emissions in tons per year.								5.84 tons/year
Total Controlled	640 pounds/year from H/S Ink divided by 2000 pounds/ton = Controlled Actual air emissions in tons per year.								0.32 tons/year

In Table 6, uncontrolled emissions are calculated using nonheatset inks (non H/S), cleaning solutions, and heatset inks before consideration of controls. Controlled emissions are calculated from heatset inks (H/S) using a press with a thermal oxidizer as the control device.

In this example, based on actual uncontrolled VOC emissions of 5.84 tons per year, this facility, if located in an ozone non-attainment area, would need to file an Air Pollutant Emission Notice (APEN) and obtain an air permit since VOC emissions exceed the two ton per year permit threshold in Regulation No. 3, Part B (refer to Table 4).

### 8.7 Calculating Hazardous Air Pollutant (HAP) Emissions

The method for calculating HAP emissions is similar to that used to calculate VOC emissions in the previous section. It is important to note that HAP quantities in pounds per gallon (lb/gal) are rarely provided on Material Safety Data Sheets (MSDS). Typically, the MSDS lists individual HAPs and the percent by weight of each. Your printing facility may not have reportable HAPs but you should document that you have made this determination, and if necessary, file the appropriate paperwork to report them. A guidance document titled, “A Simple Guide to Calculating and Reporting Air Emissions for VOCs and HAPs” is available to help you calculate VOC and HAP emissions. This guidance document is available online at [www.cdphe.state.co.us/ap/sbap/sbapvoccalcs.pdf](http://www.cdphe.state.co.us/ap/sbap/sbapvoccalcs.pdf) or by contacting the Small Business Assistance Program.

### 8.8 Boilers

As a general rule of thumb, a printing facility that has a boiler with a heat input capacity *greater than* 10 million British Thermal Units per hour (MMBtu/hr) is typically required to file an APEN with the APCD and obtain an air permit. A facility with a boiler that has a heat input capacity *less than* or equal to 10 MMBtu/hr will typically be required to file an APEN only when the fuel throughputs in Table 7 are exceeded. Note: fuel throughputs listed in Table 7 are dependent upon whether the facility is located in an ozone attainment/maintenance or non-attainment area.

**Table 7**

<b>Fuel Type</b>	<b>Attainment/Maintenance Area</b>	<b>Nonattainment Area</b>
APEN Reporting Threshold	2 tons per year	1 ton per year
Liquid Petroleum Gas (gallons per year)	95,238	190,476
Natural Gas (million standard cubic feet, mmscf/yr)	20	40
Fuel Oil No. 4, 5, 6 (residual) and distillate (No. 1 and 2) (gallons/yr)	36,364	72,727

<sup>1</sup>Fuel estimates are based on emission factors from EPA's AP-42, "Compilation of Air Pollution Emission Factors".

Use the General APEN form to report information about your boiler, including design heat input rate, types of fuel burned, fuel consumption rates, fuel heating values, and any control equipment. The General APEN form is available through the APCD and may be downloaded at: <http://www.cdphe.state.co.us/ap/downloadforms.html>. A single APEN may be used to list multiple identical boilers.

Colorado air regulations include two reporting exemptions for small boilers:

1. Boilers that use only gaseous fuel with a maximum heat input capacity of less than or equal to five (5) MMBtu/hr are exempt from APEN requirements, unless the unit is a part of a process (Regulation No. 3, Part A, Section II.D.1.k) and;
2. Boilers that use only gaseous fuel, with a maximum heat input capacity of less than or equal to ten (10) MMBtu/hr, that are used solely for heating buildings for personal comfort are exempt from APEN requirements (Regulation No. 3, Part A, Section II.D.1.ggg)

## 8.9 Emergency Generators

Emergency power generators that were previously exempted from air permitting requirements may now have to be permitted. Emergency power generators that were constructed, reconstructed or modified (including those new to Colorado) after July 11, 2005 may have to be permitted under a new federal standard called a "New Source Performance Standard" (NSPS) found in 40 CFR Part 60 Subpart IIII. If your printing facility has or will purchase an emergency generator, the unit may have to be certified to meet the required Non-road Engine Tier standards and your facility will have to comply with specific emission standards for operating the generator. If you have any questions about these requirements, contact the Small Business Assistance Program.

### Who is subject to Subpart IIII?

- Owners or operators of stationary compression ignition internal combustion engines that commence construction, reconstruction, or modification (as defined at 40 CFR 60.14) after July 11, 2005 or stationary compression ignition internal combustion engines (ICE) that are new to Colorado after July 11, 2005;
- Manufacturers of 2007 and later model year compression ignition ICE.

A specialty APEN is available for generators. If the generator is portable or does not meet the applicability requirements listed above then it may be exempt from permitting. A NSPS IIII guidance document is available from the APCD and is downloadable under "Engines and Generators" at [www.cdphe.state.co.us/ap/stationarylibrary.html](http://www.cdphe.state.co.us/ap/stationarylibrary.html).

## 8.10 Thermal Oxidizers

A thermal oxidizer (TO) is a control device used to combust primarily VOC and HAP emissions. Combustion byproducts such as sulfur oxides (SOx), nitrogen oxides (NOx) and CO emissions are typically negligible from a thermal oxidizer. It is important, however, that you submit information regarding the oxidizer with your APEN, if applicable. This information is used to calculate controlled air emissions from your printing operations. Calculations for controlled air emissions would include those products used with equipment (presses) controlled by the oxidizer. If you plan to add a thermal oxidizer to an existing plant, you will need to submit an APEN for the change in control equipment prior to the change. You will need to report the following specifications for the thermal oxidizer: make, model, and serial number, type of oxidizer (thermal or catalytic), type of fuel (usually natural gas) and quantity burned, and the control efficiency. Typically, an oxidizer has a control efficiency of 95-99% for VOCs. Recordkeeping requirements, if any, for the oxidizer will be included in your air permit, if applicable.

## 8.11 Recordkeeping Requirements



Your print shop may be required to maintain air emission records for VOCs, HAPs, and/or other air pollutants as specified in your air permit. These records must be available to the APCD for inspection upon request. Your facility should maintain a copy of the most recent APEN, fee (check or cancelled check), air permit, air emissions calculations, and other documents as required by your air permit. The air permit number must be permanently affixed on each piece of permitted equipment for ease of identification (e.g., presses and control equipment).

## 8.12 Air Emission and Permitting Fees



**APEN Fee:** \$152.90 per APEN

This includes APENs submitted for administrative changes such as a change in ownership or a change in location.

The APEN fee is subject to change by the legislature on an annual basis.

**Annual Fee:** \$17.97 per ton of criteria pollutant (SOx, NOx, etc.)

\$119.96 per ton of non-criteria reportable pollutant (HAP)

Fees are based on annual actual uncontrolled emissions reported on your most recent APEN form. Fees are subject to change by the legislature on an annual basis.

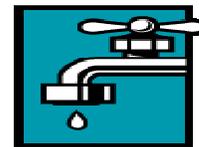
**Permit Processing Fee** \$76.45 per hour

**Fee**

Please submit a cancellation form if you no longer have reportable air emissions or if your printing facility is no longer in operation.

### 8.13 Top Ten Air Pollutant Violations

Top Ten Air Pollutant Violations for Printers	
<input type="checkbox"/>	Failure to notify the Division of air emissions and file an Air Pollutant Emission Notice (APEN).
<input type="checkbox"/>	Failure to comply with air permit limits e.g., exceedance of throughputs or VOC limits.
<input type="checkbox"/>	Failure to maintain appropriate records to demonstrate compliance with an APEN or air permit limit e.g., VOC and HAP emissions records, rolling 12-month totals.
<input type="checkbox"/>	Improper disposal of VOCs by evaporation or spillage.
<input type="checkbox"/>	Failure to file an APEN update within the 5-year renewal period.
<input type="checkbox"/>	Failure to notify the Division of a change in equipment or process.
<input type="checkbox"/>	Failure to notify the Division of a name change or transfer of ownership.
<input type="checkbox"/>	Failure to install control equipment.
<input type="checkbox"/>	Failure to use required control equipment.
<input type="checkbox"/>	Failure to properly maintain control equipment, including documentation of appropriate operating parameters and maintenance.



## 9.0 Wastewater Requirements

### 9.1 Discharges to the Sanitary Sewer

Printing facilities are not allowed to discharge industrial waste (non-domestic wastewater) to the sanitary sewer system without notifying the local sanitation district or publicly owned treatment works (POTW). A list of POTWs is available online at [www.cdphe.state.co.us/wq/PermitsUnit/pretreat/POTWcompletelisting.pdf](http://www.cdphe.state.co.us/wq/PermitsUnit/pretreat/POTWcompletelisting.pdf). Be prepared to provide information to the sanitation district regarding the proposed wastewater discharge. The following information may be requested:

- A description of the substances proposed for discharge;
- A description of the process generating the waste;
- The quantity of waste to be discharged e.g., gallons per day or gallons per month;
- The frequency of discharge e.g., one-time, continuous;
- A description of any treatment prior to discharge e.g., neutralization;
- Analytical data on the proposed discharge;
- Material Safety Data Sheet(s) on the substances proposed for discharge

In addition to your sanitation district's requirements, there are specific state prohibitions for all industrial dischargers.

#### Printing operations are **Not** allowed to:

- Discharge or transport silver-bearing wastewater to a sewer treatment plant in excess of the limitations provided by the POTW.
- Discharge wastewater with a pH lower than 5.0. Facilities should consult with their POTW to determine if their discharge is regulated by any upper pH limitation. Facilities discharging wastewater with a pH of greater than or equal to 12.5, must report these discharges to their local POTW, the Colorado Department of Public Health and Environment (CDPHE), and Region VIII EPA in accordance with the requirements set forth at 40 CFR 403.12.
- Discharge dichromate (chromic acid) film processor cleaners in excess of the limitations provided by the POTW.
- Discharge hazardous wastes to a sewer treatment plant without notification to the local POTW, CDPHE, Region VIII EPA, and approval of the local POTW.
- Discharge petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will interfere with local sewer treatment plant operations.
- Discharge wastewater to a sewage treatment plant any material that may cause a fire hazard or interfere with the local sewage treatment plant operations (e.g., solvents, solids, viscous materials, oxygen demanding pollutants, heated process waters, etc.).

Contact your local sewer authority or the Water Quality Control Division for guidance. Information is available online at [www.cdphe.state.co.us/wq/PermitsUnit/](http://www.cdphe.state.co.us/wq/PermitsUnit/).

### 9.2 Discharges to a Septic System

Printing facilities that have a private septic system must not discharge any industrial wastewater into that septic system. Only domestic wastewater (bathrooms, kitchens, etc.) may be discharged to a septic system.

### 9.3 Shipment of Wastewater Offsite

If your wastewater is hazardous, you must use a licensed transporter to ship it offsite. A precious metals transporter can transport silver-bearing wastewater and sometimes nonhazardous wastewater (developer and rinse water). If the wastewater is nonhazardous, a septage hauler may transport the wastewater to your local POTW if it is permitted to do so. You must have written approval from the local sewer authority prior to transporting wastewater to your local POTW. Reuse or recycling is encouraged when feasible.

### 9.4 Top Ten Non-domestic Wastewater Violations

Top Ten Non-domestic Wastewater Violations For Printers	
<input type="checkbox"/>	Failure to comply with specific effluent limitations.
<input type="checkbox"/>	Failure to self-monitor at the frequency or in the manner prescribed by the POTW.
<input type="checkbox"/>	Failure to maintain records of self-monitoring and waste disposal activities for a minimum of three years.
<input type="checkbox"/>	Failure to maintain records of all calibration and maintenance activities for all equipment used to fulfill self-monitoring requirements.
<input type="checkbox"/>	Failure to update plans (e.g., spill, toxic organic, engineering calculations, etc.) as required.
<input type="checkbox"/>	Failure to provide period compliance, non-compliance, accidental discharge, and other reports within the prescribed time frame.
<input type="checkbox"/>	Failure to accurately report non-compliance.
<input type="checkbox"/>	Failure to provide information as requested by the POTW.
<input type="checkbox"/>	Failure to notify of process waste batch discharges.
<input type="checkbox"/>	Failure to notify of a discharge of hazardous waste.

---

## 10.0 Stormwater Requirements

---



The Water Quality Control Division also regulates stormwater runoff that has been in contact with industrial storage materials, wastes and other potential sources of contamination. Stormwater regulations are designed to prevent chemicals and wastes from contaminating surface and groundwater. Printing and Imaging facilities that fall under Standard Industrial Classification (SIC) major Group 26 – Paper and Allied Products or Group 27 – Printing, Publishing, and Allied Products, are included in the list of industrial activities that may require a stormwater permit if industrial activities are exposed to stormwater. A complete list of regulated industrial activities is available online at [www.cdphe.state.co.us/wq/PermitsUnit/SWFactsheet.pdf](http://www.cdphe.state.co.us/wq/PermitsUnit/SWFactsheet.pdf). If your company keeps potential sources of contamination under cover or protected from stormwater (rain and snow), you may qualify for a “No Exposure Certification”.

### 10.1 No Exposure Certification

If **all** industrial activity, materials handling and storage at your facility is protected from precipitation, you do not need to obtain a permit. Instead, you must complete a “*Stormwater No Exposure Certification for Exclusion from CDPS Stormwater Permitting*”. A copy of the No Exposure Certification and a checklist to help you determine if your facility meets the no exposure exclusion requirements is available online at [www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html](http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html). If any industrial activities or materials are or will be exposed to precipitation, your facility is not eligible for the No Exposure exclusion.

There is no fee associated with submittal of the No Exposure Certification form. However, if you are currently under a stormwater discharge permit, any invoices already received for permit coverage must still be paid.

### 10.2 Stormwater Permitting

If your facility is not eligible for the “No Exposure” exclusion, you will be required to obtain a stormwater permit. Printing facilities that are not eligible for this exclusion must complete the “General Permit Application for Stormwater Discharges Associated with Light Industrial Activity”.

The permit application form is available online at [www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html](http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html). The permit requires you to control and eliminate the sources of pollutants from your facility that may come into contact with stormwater through development and implementation of a Stormwater Management Plan (SWMP). The purpose of the SWMP is to identify possible pollutant sources to stormwater and to apply Best Management Practices (BMPs) that, when implemented, will reduce or eliminate any possible water quality impacts. SWMP guidance is available online at [www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html](http://www.cdphe.state.co.us/wq/PermitsUnit/stormwater/industrial.html). Completion of a SWMP is required prior to application. Full implementation of the SWMP is required at the start of facility operations or when the permit certification becomes effective, whichever is later.

#### **Examples of Best Management Practices** (list is not all inclusive)

- Keep all chemical activities and storage contained within your building or within a protected shelter.
- Caution must be exercised around loading docks and parking lots where materials are moved between vehicles and your print shop. If your loading dock is covered, chemicals or other materials brought into the facility via the loading dock will not be exposed to stormwater.

- Use lids or cover dumpsters, compactors, or other containers outside.
- Materials stored in drums, barrels, and tanks intended for outdoor storage must be tightly sealed and kept in good condition (do not leak).
- Place chemical containers on an impervious surface and provide with secondary containment to prevent leakage or overflow from that area.
- Remember that the addition of material to or withdrawing of material from these containers while outside is deemed exposure.
- Perform maintenance activities on fleet vehicles or material handling equipment inside of a building.
- Clean up spills immediately. Basic precautions are fundamental to reducing the risk of spills and potential exposure to stormwater. Spill control and clean up supplies should be available near chemical storage and material handling areas.
- All personnel involved in industrial activities that may impact stormwater runoff should be trained on your facility's SWMP.
- Review your stormwater management plan and practices and reduce the potential for stormwater exposure.

**Fees**

Annual fee: \$232.00 (fees are subject to change).

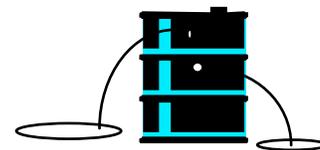
### 10.3 Top Ten Industrial Stormwater Violations

Top Ten Industrial Stormwater Violations For Printers	
<input type="checkbox"/>	Failure to obtain a permit or no exposure certification.
<input type="checkbox"/>	Failure to implement a Stormwater Management Plan (SWMP).
<input type="checkbox"/>	Failure to maintain a Stormwater Management Plan.
<input type="checkbox"/>	Failure to perform basic good housekeeping to clean up spills and materials that could pollute stormwater.
<input type="checkbox"/>	Storage of materials exposed to stormwater without adequate controls to prevent the discharge of pollutants.
<input type="checkbox"/>	Failure to perform and document inspections at least twice a year.
<input type="checkbox"/>	Leaks from vehicles or equipment that are not managed to prevent stormwater pollution.
<input type="checkbox"/>	Failure to train staff, including temporary staff or contractors, on necessary practices to prevent stormwater pollution.
<input type="checkbox"/>	Failure to submit an Annual Report on permit compliance.
<input type="checkbox"/>	Failure to manage waste disposal areas, such as dumpsters, to control stormwater pollution.

---

## 11.0 Spills and Reporting

---



### 11.1 Spill Release Reporting

When a chemical spill or release occurs at a facility in Colorado, there are a number of reporting and notification requirements that must be followed by an authorized person at the facility where the spill or release occurred. The Superfund Amendments and Reauthorization Act (SARA) Title III, a federal law with which facilities must comply in Colorado, requires release reporting. Facilities such as printing operations must immediately report any release that exceeds the reportable quantity (RQ) for a specific chemical to the agencies listed below. Reporting is mandatory for any chemical on the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) list or on the Extremely Hazardous Substance (EHS) list (EPCRA Section 302) and you must report within 15 minutes of the release.

Releases of Extremely Hazardous Substances that equal or exceed the Reportable Quantity (Section 304 EHS RQ) are subject to state and local reporting. Releases of CERCLA Hazardous Substances that equal or exceed the RQ are subject to reporting to the National Response Center (NRC) and also to the state and local agencies listed below. A list of chemicals and their reportable quantities is available online at [www.cdphe.state.co.us/el/sara/tierIIreports.html](http://www.cdphe.state.co.us/el/sara/tierIIreports.html) (go to the bottom of the web page). This list is referred to as the SARA Title III List of Lists (LOL). The List of Lists provides RQs in pounds or curies. If your release is in another unit, such as gallons, you must calculate the release into pounds.

In addition to telephone notification, the responsible party must send written notification describing the release and associated emergency response to both the Colorado Emergency Planning Commission (CEPC) and your Local Emergency Planning Commission (LEPC) as soon as practicable after the release (no later than 2 weeks). An online release and reporting form is available online at [www.cdphe.state.co.us/hm/spillsandreleases.htm](http://www.cdphe.state.co.us/hm/spillsandreleases.htm). Remember to always plan ahead, be prepared to respond and report before an accident happens.

1. National Response Center (NRC)  
1(800) 424-8802 (24-hour)
2. Colorado Department of Public Health (CDPHE is the CEPC)  
1(877) 518-5608 (24-hour)
3. Local Emergency Planning Committee (LEPC)  
A list of LEPC is available online at [www.cdphe.state.co.us/el/sara/lepclist.html](http://www.cdphe.state.co.us/el/sara/lepclist.html)
4. Transportation incidents should be reported to 911.



Information on spill release reporting is available online at [www.cdphe.state.co.us/hm/spillsandreleases.htm](http://www.cdphe.state.co.us/hm/spillsandreleases.htm).

### 11.2 Spill Response

If you have a spill at your facility, the following actions are recommended:

- Have a plan for spill response before an accident happens.
- Train employees on spill response procedures.
- Evacuate the immediate area of personnel.
- Shut down or disconnect equipment that may cause a spark or fire.

- Secure the area with tape or barricades.
- Identify the hazardous materials without being exposed to the material.
- Utilize trained personnel with appropriate personnel protective equipment (gloves, respirator, chemical suit, etc.) to contain and clean up the spill.
- Make sure that you have the Material Safety Data Sheet for all of your products available (and employees know where the MSDS book is kept) in case of an emergency.
- If the spill response exceeds in-house capabilities, contact the fire department or a private emergency response contractor.
- Try to segregate reusable and waste materials. Place waste into approved Department of Transportation (DOT) containers and label the container with the contents.
- Document the clean up effort.
- If soil or water contamination is noted, determine the quantity of material lost and contact the Colorado Department of Public Health and Environment and other agencies as required.
- Ensure proper federal, state, and local government agencies are notified in accordance with the spill reporting requirements in this section.

The Occupational Safety and Health Administration (OSHA) requires that a spill of hazardous materials be controlled and cleaned up promptly. Under OSHA requirements (29 CFR 1910.120), employees responding to hazardous material spills that require personnel beyond those in the immediate area must receive specific training in the emergency procedures and equipment that applies to the response tasks. Refer to the OSHA website for more information at [www.osha.gov](http://www.osha.gov).

---

## 12.0 Emergency Planning and Community Right-to-Know Requirements

---



The Emergency Planning and Community Right-to-Know Act (EPCRA) requires reporting and notification for certain hazardous chemicals. Under EPCRA, businesses are required to report chemical inventories for those chemicals stored in excess of threshold planning quantities (TPQ) and notify authorities in the event of a toxic release. EPCRA was developed to ensure that states and communities have information from businesses like yours in which to develop chemical emergency plans and to provide public access to information about the use and storage of chemicals in their communities.

### 12.1 Emergency Response Planning (EPCRA Sections 301-303)

A facility that possesses any Extremely Hazardous Substances (EHS) at or above the TPQ is obligated to follow emergency planning requirements and must notify the Colorado Emergency Planning Commission (CEPC), the Local Emergency Planning Commission (LEPC) and the fire department. TPQs are listed by chemical name on the list of EHSs. Under this section, your business must designate an emergency coordinator to participate in the emergency planning process and provide any information requested by the LEPC to facilitate emergency planning. A list of LEPCs (listed by county) is available online at [www.cdphe.state.co.us/el/sara/lepclist.html](http://www.cdphe.state.co.us/el/sara/lepclist.html). The Colorado Department of Public Health and Environment represents the CEPC. A search engine is available at <http://dfs.state.co.us/FireDeptInfo.htm> to locate your local fire

#### How Do You Calculate the Quantity of Extremely Hazardous Substances (EHS)?

The quantity calculation includes the total amount of EHS present at a facility at any one time, regardless of location, number of containers, or storage method. Mixtures containing EHS are included and the regulations detail how to calculate them. A list of Extremely Hazardous Substances is available online at [www.cdphe.state.co.us/el/sara/tier1reports.html](http://www.cdphe.state.co.us/el/sara/tier1reports.html).

department. The fire department is typically a member of the LEPC.

## 12.2 Emergency Notification (EPCRA Section 304)

Your facility must notify the CEPC and LEPC if there is a release into the environment of a hazardous substance that exceeds the Reportable Quantity (RQ). This requirement covers Extremely Hazardous Substances (EHS) regulated under EPCRA and CERCLA hazardous substances (refer to Definitions in Appendix A). Initial notification can be made by telephone, radio or in person, with written follow-up submitted to the CEPC and LEPC as soon as practicable after the release. Since emergency notification applies to CERCLA hazardous substances as well as those listed in EPCRA, your business could be subject to emergency notification in the event of a release, even though you may not be required to follow any other provision of EPCRA.

## 12.3 Community Right-to-Know (EPCRA Sections 311 and 312)

Community Right-to-Know Requirements apply to a facility that has at any one time:

- Any EHS in a quantity greater than 500 pounds or the Threshold Planning Quantity (TPQ), whichever is less; or
- Any other hazardous chemical as defined by OSHA in a quantity of 10,000 pounds or more.

For those hazardous chemicals and EHS above these threshold amounts, your business must submit a list of the chemicals and their associated hazards to the CEPC, the LEPC and the local fire department. You must also annually submit a hazardous chemical inventory report to the CEPC, LEPC and the local fire department for those hazardous chemicals and EHS that exceeded thresholds at any one time during the preceding year. The State of Colorado requires you to submit the **TIER II** report as the annual reporting form. A copy of the TIER II form and guidance is available online at [www.cdphe.state.co.us/el/sara/tierIIreports.html](http://www.cdphe.state.co.us/el/sara/tierIIreports.html). You should contact your LEPC and the fire department to determine if they require additional reporting.

## 12.4 Toxic Release Inventory (TRI) (EPCRA Section 313)

Printing facilities with ten or more full-time employees that **Process or Otherwise Use** a listed toxic chemical above threshold quantities are required to complete a **Toxic Chemical Release Inventory (TRI)** form and submit it annually to EPA and the State by July 1 of every year. This report accounts for all losses of a chemical through business activities including air emissions, hazardous wastes, water discharges and accidental spills and releases. Reporting levels are generally 25,000 pounds processed in a reporting year or 10,000 pounds otherwise used. There are lower thresholds for chemicals of special concern which are persistent, tend to bioaccumulate or are highly toxic. For printers, if a chemical becomes part of the final product such as a pigment, it is classified as "Processed". If the chemical does not become part of the final product such as a cleaning solvent or fountain solution additive, it is classified as "Otherwise Used".

Most printers are not required to report under TRI because they do not use enough chemicals on the list to trigger reporting. However, to confirm this, you should prepare a list of the products that are used in the greatest quantity such as inks, coatings, cleaning solvents, etc. and unless 10,000 pounds of any of these products were used, then reporting is not necessary. If more than 10,000 pounds was used, then the ingredients in those products should be compared to the Section 313 list to see if any chemicals in them appear on the list. If so, a calculation of individual usage should be performed. It is important to also look at the Persistent Bioaccumulative and Toxic (PBT) chemicals as they have very low reporting thresholds. TRI forms and instructions are available online at [www.cdphe.state.co.us/el/sara/trireport.html](http://www.cdphe.state.co.us/el/sara/trireport.html) or by calling the EPCRA Hotline at 1(800) 424-9346. A guidance document specifically for printers developed by the EPA entitled, "Emergency Planning and Community Right-to-Know Act Section 313

Reporting Guidance for the Printing, Publishing, and Packaging Industry is available online at [www.epa.gov/tri/guide\\_docs/pdf/2000/00printing.pdf](http://www.epa.gov/tri/guide_docs/pdf/2000/00printing.pdf). This document provides examples and detailed explanations on TRI reporting for the Printing, Publishing, and Packaging Industry.

## 12.5 EPCRA Fees

Facilities required to report under the Federal Emergency Planning and Community Right-to-Know Act, SARA Title III, Sections 302/311/312 (typically Tier II) and/or 313 (TRI), are subject to Pollution Prevention fees under the authorization of the Colorado Pollution Prevention Act. You should not submit payment with Tier II or TRI reports. You will be billed based on your reporting information (refer to Table 8 below).

How are my fees calculated?

**Table 8**

\$10.00	For each facility required to report under EPCRA or SARA Title III.
\$10.00	For each hazardous and/or extremely hazardous substance exceeding EPA reporting thresholds under EPCRA Section 311/312, (Typically reported on the Tier II Hazardous Chemical Inventory Report).
\$25.00	For each hazardous substance exceeding EPA reporting thresholds under the Toxic Release Inventory reporting requirement of EPCRA Section 313, (TRI).

Fees are capped at \$1,000 maximum for any one reporting organization that owns or operates multiple reporting facilities in Colorado.

Your invoice may contain fee information for more than one facility you own or operate. It is also possible that you may receive a separate invoice for each facility. In this situation, you may choose to send one check which will cover all of your facilities, YOU MUST identify, by customer or invoice number, which facilities are to be included with that payment.

## 12.6 Top Ten EPCRA Violations

Violations - EPCRA Section 311/312 And 313 and Spill Reporting	
<input type="checkbox"/>	Failure to report TIER II (Section 311/312) chemicals.
<input type="checkbox"/>	Failure to report TRI (Section 313) chemicals.
<input type="checkbox"/>	Failure to accurately report TIER II or TRI chemicals (leads to underreporting or facility reports lower local thresholds on the federal reports).
<input type="checkbox"/>	Failure to report fuels or refrigerants under TIER II and TRI (facilities don't think of fuels or refrigerants as hazardous chemicals).
<input type="checkbox"/>	Failure to report Sulfuric acid from lead acid batteries under Section 312/312 (TIER II).
<input type="checkbox"/>	Failure to report the lead under Section 313 (TRI) e.g., welding operations.
<input type="checkbox"/>	Failure to report listed metals under Section 313 (TRI) e.g., alloys.
<input type="checkbox"/>	Failure to report Nitric acid under Section 313 (TRI) e.g., facility neutralizes the Nitric acid to discharge as wastewater, neutralization forms Nitrate compounds that are reportable under Section 313.
<input type="checkbox"/>	Failure to report spill releases under Section 302/304 of EPCRA.
<input type="checkbox"/>	Failure to report spill releases in a timely manner (within 15 minutes of the release by telephone and written notification no later than 2 weeks after the release).



## 13.0 Occupational Health and Safety (OSHA)

This section does not contain all relevant safety and health compliance issues but provides a brief overview of some of the health and safety issues that should be addressed at your printing facility, including the top ten OSHA violations. Refer to the resource guide in Appendix F at the end of the workbook for contacts and information on OSHA compliance.

Section 5(a)(1) of the OSH Act, often referred to as the General Duty Clause, requires employers to "furnish to each of its employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to its employees".

Section 5(a)(2) requires employers to "comply with occupational safety and health standards promulgated under this Act".

**Workplace health and safety** is an important management responsibility in your printing facility. To ensure the safety and health of workers in your business, management must establish a focus on safety that includes elements such as:

- management leadership and commitment
- employee engagement
- accountability
- safety programs, procedures, and practices
- safety goals and objectives
- safety inspections for workplace hazards
- safety program audits
- safety tracking & metrics
- hazard identification and control
- safety committees to promote employee involvement
- safety education and training
- safety communications to maintain a high level of awareness on safety

### 13.1 Right-to-Know

The Occupational Safety and Health Administration (OSHA) established Hazard Communication regulations that require employers to inform employees of the potential chemical hazards in the workplace.

In Colorado, the Right-to-Know law requires that employers:

- **Notify** employees of their rights to information, including possible health effects and hazards, concerning all toxic substances present in their workplace.
- **PROVIDE INFORMATION** in response to employee requests with specific information in written form concerning any toxic substance present in the workplace.
- **TRAIN** employees in the identity, properties and safe use of toxic substances they can expect to encounter in the course of their work. Refresher training should be held annually.
- **KEEP RECORDS** of employee exposures.

## 13.2 Hazard Communication

Hazard Communication or Right-to-Know training has five basic compliance requirements addressing chemical hazards in the workplace. The requirements are:



- Preparation and maintenance of an inventory of all hazardous chemicals and products found in the workplace. This inventory needs to be written and employers may choose whether to compile the chemical list for the workplace as a whole or for individual work areas.
- Prepare a written program that must describe how the labels and other forms of warning, the material safety data sheets (MSDS), and the employee information and training requirements of the standard will be met. It must describe who will be responsible for the in-plant labeling system used, employee training, and procedures and person(s) responsible for obtaining, maintaining and updating the MSDSs.

Additionally, the written program must outline the methods that will be used to inform outside contractors, employees of the hazards of non-routine tasks (e.g., cleaning reactor vessels) and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

- Implementation of an employee training program. Training is required for all new employees when new hazards are introduced to the workplace, or if an employee transfers to a new position and is exposed to hazards that were not previously trained. It is recommended that facilities hold annual training. The training program must be written and include:
  - A description of the hazard communication standard,
  - Physical and health hazards associated with the chemicals used in the work area,
  - Routes of entry/exposure of each hazard,
  - Procedures for safe chemical handling, including use of personal protective equipment, work practices and emergency procedures, and
  - Location of MSDS documents and how they are obtained and used.
- Implementation of a chemical container labeling program. All original and secondary containers must be clearly labeled with the chemical trade name, hazard identification (flammable, irritant, etc.) and the target organ(s) affected by the chemical.

### Material Safety Data Sheets (MSDS)

MSDS documents are supplied by the chemical supplier or manufacturer to provide users with information related to safe use, storage and handling of the product. They are your primary source of information about the chemicals used in the workplace.

You must have an MSDS on file for each chemical that is, or has been, used at your facility, prior to initial use of that chemical. MSDS documents must be located in the area where the chemical product is being used. All MSDSs must be made available to all applicable employees.

When an MSDS is revised, the most recent version of the MSDS typically replaces the older version in the file or binder. However, all previous MSDSs for chemicals that are no longer used at the facility must be retained for a

#### **TIP:**

If you store MSDS documents online, you may want to keep a set of hardcopy documents handy in case of emergency.

In the event of a fire or chemical release, fire fighters and rescue personnel may need this information.

minimum of 30 years. There are many acceptable methods for indexing and filing MSDS documents. You may want to consider creating an index or electronic spreadsheet with pertinent MSDS information, such as chemical name, supplier, revision date, personal protective equipment recommendations or other commonly used information. Printing operations often categorize MSDS documents by the process or department where the chemical is used. The arrangement of information on the MSDS may vary between manufacturers; however, all MSDS documents must contain (8) basic sections:

- Product name, manufacturer's name and address, telephone numbers for use in emergencies or to obtain additional information, and the date the MSDS was prepared or last updated;
- Hazardous ingredients and properties, including the common name and trade name;
- Chemical exposure limits, if established, must be included:
- PEL (Permissible Exposure Level) is the level established by OSHA.
- TLV (Threshold Limit Value) is a guideline established by the American Conference of Governmental Industrial Hygienists (ACGIH).
- Physical and chemical characteristics, such as boiling point, vapor pressure, solubility, appearance and odor. The Volatile Organic Compound (VOC) content of the product is typically found in this section;
- Fire and explosion hazard data, including the flash point, flammable limits, extinguishing media and any special fire fighting procedures;
- Conditions to avoid, such as reactivity or incompatibility with other materials;
- Acute and chronic health hazards, routes of entry into the body, target organs, carcinogenic properties, signs and symptoms of exposure and emergency first aid. This section is also where any OSHA regulations for this chemical will be noted;
- Precautions for safe handling and use, such as storage and waste disposal;
- Control measures to protect employees from exposure. These may include personal protective equipment (PPE) recommendations such as gloves or respirator use, or other controls such as ventilation or work practices.

### 13.3 Chemical Hazards in the Workplace

Chemicals in the workplace may present a physical hazard, such as flammability, or a health hazard such as an irritant or chemical burn.

Chemicals can be found in different forms in the workplace:

- Solids (particulates), such as toner, powder developer, dust or fumes
- Liquids, such as inks, solvents or prepress chemistry
- Gases and vapors, such as chemical vapors and natural gas or propane

Chemicals enter the body through 3 major routes: inhalation, absorption or ingestion. Refer to Table 9 below for information on routes of entry, types of hazards and prevention measures.

**Table 9**

Route	Description	Prevention
Nose or mouth	Airborne contaminants (dust, fumes, vapors) can be inhaled directly into the lungs through the nose or mouth.	Standard or localized ventilation and, in rare instances, respirators or masks. The use of respirators requires a full compliance program.
Eye	Liquids, particulates (toner, dust), gases and vapors can have direct contact with the eyes.	Personal protective equipment such as safety glasses, goggles, full face masks
Skin	Chemicals, particularly certain solvents can be absorbed through the skin.	Gloves, protective aprons, good hygiene practices such as washing hands before breaks and lunch.
Ingestion	Chemical dusts inhaled and swallowed, or contaminated objects (such as cigarettes) placed in the mouth.	Dust masks, good hygiene practices. Do not allow smoking or food to be stored or consumed in work areas where harmful chemicals are used.

### 13.4 Personal Protective Equipment



Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, and respiratory devices must be provided wherever it is necessary in your print shop e.g., chemical hazards.

OSHA requires that you assess the workplace to determine if hazards are present, or are likely to be present, that necessitate the use of personal protective equipment (PPE). If hazards are present or likely to be present, you must select, and have each affected employee use, the types of PPE that will protect them from the hazards identified in the assessment. The assessment must be formal, written and certified by the person performing the assessment.

You must provide training to each employee required to use PPE. Each employee must be trained in at least the following:

- When PPE is necessary;
- What PPE is necessary;
- How to properly put on, take off, adjust, and wear PPE;
- The limitations of the PPE; and,
- The proper care, maintenance, useful life, and disposal of the PPE.

#### **Respiratory Protection**

You must provide respirators in areas where engineering controls do not protect the health of employees from inhalation hazards and in emergencies. A respiratory protection program must be developed and maintained. The respiratory program must be regularly evaluated to determine its effectiveness. The program must include training for respiratory users on:

- Selection;
- Use;
- Maintenance;
- Limitations of respirators; and
- Training on the respiratory hazards.

All respirators must be inspected, repaired, and cleaned at least monthly or after each use. You should consult a local physician to determine which employees are physically able to use respiratory equipment. Employees must not use respirators unless they have been authorized and trained to use them properly. Fit testing must be performed before an employee first starts wearing a respirator in the workplace, whenever a different respirator face piece is used and at least annually thereafter. For further information on respiratory protection, visit the OSHA website at [www.osha.gov](http://www.osha.gov) or refer to the resource guide at the end of this document (refer to Appendix F).

### 13.5 Hearing Conservation

OSHA requires that you implement a continuing, effective hearing conservation program whenever employee are exposed to noise levels of 85 decibels or greater over an 8 hour time period. The maximum allowable exposure is 90 dBA for an eight hour TWA.



The TWA is calculated based on the level of noise and length of exposure. For example, a 90 dBA TWA limit means that an employee can be exposed to noise up to 90 dBA for 8 hours. However, as the noise level increases, the length of exposure decreases. This means that employee exposure to 95dBA (protected or unprotected) may be for no more than four hours before the OSHA threshold is exceeded.

#### TIP:

If you have to raise your voice or shout to be heard in a work area, you should consider a noise monitoring study to make sure employee noise exposure is below the OSHA threshold.

Minimum requirements of a hearing conservation program include the following:

**Monitoring Program** – Typically, noise-monitoring studies are performed by an Industrial Hygienist who will sample work areas and provide you with a written report of the results. Remember to repeat noise monitoring whenever there is a change in process, equipment or production that could cause a change in exposure, especially if the changes result in a lower level of noise.

**Audiometric Testing Program** – If noise exposures are at or above the 85 dBA TWA threshold, affected employees must have a baseline within six months of employment and annual audiometric tests. If the baseline cannot be performed prior to exposure, then the employee must be provided with and wear hearing protection. Your local urgent care or industrial medicine provider usually can perform these tests. You can also check with your Workers' Compensation carrier.

**Hearing Protection Devices (HPDs)** – HPDs are used to reduce employee exposure to noise. HPDs are required to be used when employee exposure exceeds 90 dBA in an 8 hour TWA. It is recommended that web press operators and folder operators use hearing protection when operating that equipment due to noise exposures that could exceed the 90 dBA. There are many different types of HPDs available, from one-time use foam earplugs to earmuffs. Try to provide at least two different types of HPDs, so that employees can select the type that is most comfortable and effective for them.

You must be sure that the HPD Noise Reduction Rating (NRR) is sufficient to reduce employee exposure to an acceptable TWA threshold. For example, if your employee is going to be working an 8- hour shift, then the final exposure level needs to be 90 dBA. Appendix B of OSHA 1910.95 has more information on methods for estimating the adequacy of hearing protector attenuation.

**Training** – If noise exposures are at or above the 85 dBA TWA threshold, affected employees must be provided with a copy of his or her audiometric test results and given training on hearing conservation. The training should include the purpose of audiometric testing and the proper fitting and use of HPDs.

**Posting of the standard** – If noise exposures are at or above the 85 dBA TWA threshold, then a copy of OSHA's standard must be posted in a location that is accessible by all employees.

### 13.6 Medical Services and First Aid



You must ensure that medical personnel are available for employees in matters of health. In the absence of a clinic or hospital in near proximity to the workplace, someone in your shop must be adequately trained to render first aid. If your shop is in a metropolitan area, it is unlikely that you will need to have first aid trained personnel onsite. Adequate first aid supplies, however, should be readily available.

Where the eyes or body may be exposed to injurious corrosive materials or wherever a chemical or physical hazard could harm the eye, an emergency eyewash unit should be installed for quick flushing of the eyes and body within the work area for immediate emergency use (within 10 seconds of a site splash). Employees must be trained on emergency eye wash use and location. Eyewash units must be tested regularly (weekly) to assure proper operation in case of an emergency.

### 13.7 Injury and Illness Prevention Program (IIPP)

Many states require an “Injury and Illness Prevention Program” (IIPP) also called “Accident Prevention”, “Workplace Safety” or a “Health and Safety Program”. Although not OSHA required in Colorado, this program is the cornerstone of a quality safety program and its implementation is essential for your company to have the safest possible operations. Experience indicates that a high percentage of serious accidents are due in part or totally to employees breaking one or more safety rules. An Injury and Illness Prevention Program gives detailed information concerning the following areas:

- Safety Policy
- Code of Safe Practices
- Disciplinary Action
- Accident Investigation
- Hazard Assessment
- Safety Committee Guidelines

### 13.8 Injury and Illness Reporting

OSHA requires employers, including printers, with more than 10 employees to prepare and maintain annual records of recordable occupational injuries and illnesses. OSHA regulations (29 CFR 1904) for injury and illness reporting provide specific record keeping, reporting, and communication requirements for all employers. Some of the specifics include: records retention time; employee access to records; time in which specific types of injuries and illnesses must be reported; and record keeping requirements related to change of ownership. Information on injury and illness reporting is available online at [www.osha.gov/recordkeeping/index.html](http://www.osha.gov/recordkeeping/index.html). A list of basic OSHA recordkeeping requirements are listed below:

- All OSHA recordable injuries and illnesses that occur in the workplace or during the course of an employee’s duties must be entered on the OSHA 300 form (Log of Work-Related Injuries and Illnesses) and an Injury and Illness Incident Report form (OSHA 301 form), or equivalent.
- A copy of the OSHA 300A Summary of Work-Related Injuries and Illnesses for the previous completed year must be posted in the facility no later than February 1 and you must keep it posted where employees can see it until May 1.
- All employers covered by OSHA, regardless of the number of employees, must report any workplace incident that results in a fatality or the hospitalization of three or more employees.

- In the event of a fatality or three or more employees are hospitalized within 3 days of an incident, OSHA must be notified within 8 hours (or less) after the incident (accident) occurred.
- Each year a new OSHA 300 form must be completed and the subsequent OSHA 300 and 301 forms must remain in the employer's files for at least 5 years.

### 13.9 Machine Guarding

Machine guarding must be provided to protect the operator and other employees in the machine area from hazards such as rotating parts and pinch and nip points. Examples of guarding methods are two-hand tripping devices, electronic safety devices, and guarding by location (positioning hazards so they are inaccessible to employees). Guards must be affixed to the machine if possible. Fixed machinery must be secured to prevent shifting. A power cut-off device for equipment must be provided at the operator's working position. Employee training in the safe operation of each machine is required. Machinery must be inspected regularly for safe operation.

Rotating parts, such as gears and pulleys that are located 7 feet or less above working surfaces must be guarded to prevent employee contact with moving parts. Gears, sprockets, chains, belts must be guarded to prevent employees from coming into contact with moving parts.

Grinders must be permanently mounted, grounded with metallic conduit wiring, have adequate adjusted work rests (within 1/8 inch of grinding wheel) and tongue guards (within ¼ inch of wheel), individual on and off switches, ample side and splashguards and dust collection, if necessary.

Each piece of equipment should be evaluated at least annually to determine whether the guarding is adequate, effective and properly used by the operators. An evaluation should also be done anytime an employee is injured to determine if the guarding was adequate and whether it was used properly. Once the machine guarding has been evaluated and upgraded, if necessary, each operator should be trained to inspect the guards before using the machine, to use the guards properly, and never to remove or circumvent the guards.

### 13.10 Lock-out/Tag-out (LO/TO)

Lock-out/Tag-out (LO/TO) allows employees to work on presses or other equipment safely. Per OSHA standards, equipment must be locked out and tagged out before any preventive maintenance or servicing is performed. Lock-out is the process of removing the source of electrical power and installing a lock that prevents the power from being turned ON. Tag-out is the process of placing a danger tag on the source of electrical power that indicates the equipment may not be operated until the danger tag is removed.

OSHA provides a standard procedure for equipment lock-out/tag-out:

- Equipment shutdown.
- Isolating the equipment from its energy source(s).
- Machinery or equipment isolation.
- Application of the Lock-out and/or Tag-out device.
- Release of stored energy.
- Verification that the equipment is safe to work on.

Except in an emergency, a lock-out/tag-out device must not be removed by any person other than the person installing it on the equipment. In an emergency, only authorized personnel must remove the lock-out/tag-out device. The authorized personnel shall follow approved procedures. Your printing facility



should have documented lock-out/tag-out procedures. A list of company rules and procedures should be given to any person that may use a lock-out/tag-out device. Minor servicing activities that take place during normal production operations are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection such as machine guarding techniques or the *inch-safe-service technique*.

The following summarizes the essential elements of the *inch-safe-service technique*, including safeguarding practices:

- Servicing or maintenance must not be conducted when machine components are moving. Before performing any minor servicing, the machine must be STOPPED, and its drive control must be in STOP/SAFE position.
- Procedures to INCH a machine must include a pre-startup check to assure the safe positioning of employees and to assure that all tools, etc. are positioned so that they do not create a hazard for employees.
- DEACTIVATE the SAFE function immediately before safely inching the machine component for positioning purposes.
- By use of the INCH control, the components of the machine are moved to their desired position. Before beginning or resuming the minor serving activity, the drive control must be placed on STOP/SAFE by each employee working in a hazardous area.
- Steps (2) through (4) are repeated as necessary until the minor servicing is completed.

The following tasks are identified as examples of minor servicing activities commonly performed in the printing industry:

- Clearing certain types of paper jams;
- Minor cleaning, lubricating, and adjusting operations;
- Certain plate and blanket changing tasks; and,
- In some cases, paper webbing and paper roll changing.

### 13.11 Emergency Action and Fire Prevention Plans



Any printing facility that employs more than 10 people must develop a written Emergency Action and Fire Prevention Plan (29 CFR 1930.38). Facilities that employ less than 10 people do not have to develop a written plan; however, they are required to verbally communicate emergency action procedures to each employee. The written plan should cover emergencies that an employer may reasonably expect to occur in the work place. Examples are: fire; toxic chemical releases; hurricanes; tornadoes; blizzards; floods; and others disasters. The plans should include items such as:

- Fire hazards in the facility;
- Proper handling and storage procedures for chemical hazards;
- Procedures for reporting a fire or other emergencies;
- Procedures for emergency evacuation, including type of evacuation and exit route assignments;
- Procedures to be followed by employees who remain to operate critical plant operations;
- Fire protection equipment and maintenance.
- Procedures to account for all employees after evacuation;
- Availability and use of fire extinguishers, alarm systems, and automatic suppression systems;
- Responsibilities and means of egress during fire emergencies, including properly marked exits; and,

- Fire extinguisher operation and maintenance (must be inspected monthly).

### 13.12 Emergency File

It is recommended that you create an emergency file containing MSDS documents, employee roster, emergency contacts and other information that may be needed in case of an evacuation or other emergency. Keep the emergency file near a main exit point and designate an individual responsible for evacuating it during an emergency.

### 13.13 Electrical Safety

Electrical safety has long been recognized as a serious workplace hazard, exposing employees to electric shock, burns, fires, and explosions. OSHA's electrical standards are based on the National Fire Protection Association Standards NFPA 70, National Electric Code, and NFPA 70E, Electrical Safety Requirements for Employee Workplaces. Electrical accidents are largely preventable through safe work practices. Examples of these practices include the following:

- De-energizing electric equipment before inspection or repair.
- Keeping electric tools properly maintained.
- Exercising caution when working near energized equipment.
- Using appropriate protective equipment.
- Inspection and repair of frayed wiring.

All employees should be trained to be thoroughly familiar with safety procedures for their particular jobs. Moreover, good judgment and common sense are integral to preventing electrical accidents.

#### Cords, Equipment, and Tool Grounding

- Make sure all equipment and extension cords bear the mark of an independent testing laboratory such as UL, CSA, ETL or MET Labs.
- Protect flexible cords and cables from physical damage. Check cords for cut, broken, or cracked insulation. Cover cords to prevent a trip hazard.
- Keep slack in flexible cords to prevent tension on electrical terminals.
- Make sure the insulating qualities of a splice are equal to or greater than the original cord.
- Extension cords are for temporary use. Install permanent wiring when use is no longer temporary.
- Electrical panels must have 36 inches accessibility and be properly marked.
- Verify that all three-wire tools and equipment are grounded.
- Water, electrical equipment, and power cords do not mix! Use GFCI protection in wet or damp environments.
- Ground exposed parts of fixed equipment that could be energized.
- Use non-conductive tools whenever possible.
- Always double-check the operation of your voltage testers by testing a live circuit.

**Here are some ways to avoid electrical shock:**

- ▼ Keep electrical cords away from traffic areas and heat or water sources that could damage the insulation & create a shock hazard.
- ▼ Don't use an extension cord as a replacement for permanent wiring.
- ▼ Never use cords that are cracked, damaged, or broken.



You can help increase electrical safety awareness by making sure those in your workplace understand basic electrical safety guidelines. Posting labels or signs reminds employees to follow established safety procedures.

### 13.14 Forklift Safety

During the movement of products and materials, there are numerous opportunities for personal injury and property damage if proper safety procedures are not in place. OSHA requires that all employees operating a forklift must be trained and follow specific procedures for operation and maintenance of powered industrial trucks (PIT). The OSHA reference for Powered Industrial Trucks (forklifts) is 29 CFR 1910.178. This section provides a brief overview of some of the forklift safety requirements.



The training consists of three elements:

- Formal training (lecture, interactive computer, written material)
- Practical training (site-specific, demonstrations by the trainer and practical exercises performed by the trainee)
- Evaluation of the operator's skill in the workplace

Anyone who has the knowledge, training, and experience to train and evaluate forklift operators can conduct the training. All employees must be evaluated every three years to ensure that they are still operating the forklifts in a safe manner. You must keep a record of forklift training and evaluations.

Records should include the following:

- The name of the operator,
- Date of the training,
- Date of evaluation, and
- The name of the person(s) giving the training and evaluation.

Initial training must include the following topics:

<b>General Forklift Topics:</b>		<b>Workplace-specific Topics:</b>	
	Operating instructions, warnings and precautions for types of industrial truck the operator will be authorized to operate.		Surface conditions where the vehicle will be operated.
	Differences between the forklift and an automobile.		Composition of loads to be carried and load stability.
	Vehicle controls and instrumentation: Where they are located, what they do and how they work.		Load manipulation, stacking and unshackling.
	Engine or motor operation.		Pedestrian traffic where the vehicle will be operated.
	Steering and maneuvering.		Narrow aisles and other restricted places where the vehicle will be operated.
	Visibility (including restrictions due to loading).		Hazardous (classified) locations where the vehicle will be operated.
	Fork and attachment adaptation, operation and use limitations.		Ramps and other sloped surfaces that could affect the vehicle's stability.
	Vehicle capacity.		Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust.
	Vehicle stability.		Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
	Vehicle inspection and maintenance that the operator will be required to perform.		Hands-on demonstration using the type of vehicle that the operator will actually be using.
	Refueling and/or charging and recharging of batteries.		Changes in workplace conditions that could affect safe operation (such as: new trenches, new worker access routes or new staging areas on construction sites).
	Operating limitations.		
	Other operating instructions, warnings or precautions listed in the operator's manual for the types of vehicle that the employee is being trained on.		

Refresher training, including an evaluation of the effectiveness of that training, must be conducted to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely. Safe operating procedures and rules must be followed according to the OSHA standard. Forklifts must be properly maintained. Prior to use of the forklift each shift, a check of the following items (as applicable) must be conducted by the operator:

- Lights
- Horn
- Brakes
- Leaks
- Warning Beacon

If any deficiencies are noted, the unit is to be placed OUT OF SERVICE until the problem has been corrected. For further information on the requirements for powered industrial truck safety, visit the OSHA website at [www.osha.gov](http://www.osha.gov) or refer to the resource guide in Appendix F of this workbook.

### 13.15 OSHA Recordkeeping

Recordkeeping is an important part of compliance. At a minimum, you should retain the following records related to health and safety:

- OSHA Form 300/300A. Remember, your summary form for the previous year



should be posted from February 1 to May 1 of the following year.

- Employee Right-to-Know, Personal Protective Equipment, Lock-out/Tag-out and other training records. (e.g., dates, names of employees, trainer and a description of the training provided).
- MSDS documents for all workplace chemicals used in the past 30 years or that are currently being used.
- Noise monitoring studies, audiometric tests and training records associated with a Hearing Conservation program.
- Industrial hygiene monitoring and/or chemical exposure data.
- Hazard assessment documentation for PPE and other health and safety programs.
- Documentation of written plans or programs such as a fire prevention plan, respiratory protection program, LOTO, etc.
- Maintenance and recordkeeping required under PPE, Respirators, LOTO, and other standards.

You must have a legible and conspicuous sign, informing employees of their right to information regarding toxic substances found in the workplace. This must be posted in the workplace, such as on employee bulletin boards or similar locations.

### 13.16 OSHA – Top Ten Violations

Top Ten OSHA Violations For Printers	
<input type="checkbox"/>	Failure to control hazardous energy (no lock-out/tag-out program).
<input type="checkbox"/>	Failure to develop a Hazard Communication Plan or Training.
<input type="checkbox"/>	Failure to develop a Forklift Safety Program or Training.
<input type="checkbox"/>	Failure to follow safe practices for Electrical Hazards (wiring methods, general safety procedures).
<input type="checkbox"/>	Failure to provide adequate machine guarding.
<input type="checkbox"/>	Failure to provide adequate Personal Protective Equipment (PPE) or Training.
<input type="checkbox"/>	Failure to develop an adequate Emergency Evacuation Plan or Training.
<input type="checkbox"/>	Failure to follow fire/evacuation procedures (e.g., lack of fire extinguisher training, fire extinguishers are inaccessible, exit lights are out, or exit doors are blocked).
<input type="checkbox"/>	Failure to maintain/post OSHA 300A forms.
<input type="checkbox"/>	Failure to comply with Occupational Noise Exposure Requirements.

For more information on OSHA requirements, refer to the resource guide in Appendix F or visit the OSHA website at [www.osha.gov](http://www.osha.gov).



## 14.0 Additional Considerations

### 14.1 Hazardous Material Handling and Storage

The storage and handling of flammable and combustible materials are governed by OSHA regulations and the Fire Prevention Division at the City and/or County level. If the local fire codes are more stringent than OSHA regulations, which is almost always true, then the local fire codes need to be followed. Most fire departments use the International Fire Code.

The fire code requires limits of quantities of flammable and combustible liquids in your printing facility. OSHA and the Internal Fire Codes use the National Fire Protection Associations (NFPA) classification system where flammable substances are Class I and combustibles are Class II and Class III. The classes are further broken down as follows:

- Class 1A (flash point below 73° F and a boiling point below 100° F)
- Class 1B (flash point below 73° F and a boiling point above 100° F)
- Class 1C (flash point above 73° F and below 100° F)
- Class II (flash point above 100° F)
- Class IIIA (flash point above 140° F and below 200° F)
- Class IIIB (flash point above 200° F)

The classification of the liquid will determine the quantity of product that can be stored in your building. As an example, a printing operation can keep 30 gallons of a Class 1A liquid “in storage” without any special protection. Special protection means fire sprinklers or a flammable liquid cabinet. To exceed that amount, the special protection is required.

Table 10 lists the quantities of flammable and combustible liquids that are allowed in an area without any special protection. This table is based upon the requirements from the 2006 International Fire Code (most fire departments use the 2006 IFC when conducting inspections).

Example of Quantities of Flammable and Combustible  
Liquids Allowed in an Area Without Special Protection

**Table 10**

Class of material	Storage (gallons)	Open Use (gallons)
Class 1A	30	10
Class 1B & 1C	120	30
Class II	120	30
Class IIIA	330	80
Class IIIB	13,200	3,300

Contact your local fire department or fire district concerning specific quantities of product that can be stored in your business and the proper storage procedures (refer to Resources in Appendix F).

#### 14.1.1 NFPA Requirements for Storage in Process Areas

- Do not use glass or open containers for transportation or storage of liquids.
- The volume of Class I, Class II, and Class IIIA liquids stored in a storage cabinet shall not exceed 120 gallons.
- Class I liquids must not be dispensed into metal containers or tanks unless metal to metal contact is maintained during filling e.g., bonded and grounded.
- In an industrial occupancy, additional storage cabinets are permitted if a minimum of 100 ft. is maintained between each group and the total volume of each group does not exceed 360 gallons.
- Class I and Class II liquids must be kept in original shipping containers or metal containers or tanks when not in use.
- Ignitable and reactive wastes must be stored at least 50 feet from your property line.
- There are local and state requirements regarding the location of floor drains in proximity to hazardous material and waste storage. Open floor drains are not allowed near storage areas.

#### 14.2 Hazardous Materials Inventory Statement (HMIS)

If your business uses, stores or handles hazardous materials and quantities exceed the permit thresholds listed in the Uniform Fire Code (UFC), you are required to obtain an annual Hazardous Materials Permit from your local fire department. Permit levels (based on aggregate quantities of hazardous materials used or stored) can be obtained from your local Fire Department. The Hazardous Materials Permit constitutes permission to maintain, store, use or handle materials or conduct processes that produce conditions hazardous to life or property. The following items are typically required to obtain your Hazardous Materials Permit:

- General Information form
- Chemical Inventory Report (a spreadsheet with quantities of hazardous materials used/stored and a aggregate sheet that totals the materials by hazard class)
- Hazardous Materials Management Plan (HMMP)
- Facility Graphic Maps
- Information on NFPA placarding (a sign or notice regarding chemical hazards at your facility).

A list of local fire department contacts is available online at <http://dfs.state.co.us/FireDeptInfo.htm>.

Note: if you have chemical reporting calculations for the Emergency Planning Community Right-to-Know Act (EPCRA) reporting discussed in Section 12.0, you may be able to use these calculations to determine your hazardous material reporting requirements.

---

## 15.0 Continual Improvement

---



If you own or operate a commercial printing operation and are concerned with business competitiveness, environmental regulations, waste, and a sustainable business environment, moving beyond compliance is essential for your business. Using this workbook and incorporating its concepts into your current business practices could be one of the most important business planning decisions you make. Stringent environmental health and safety regulations increase demands on the competitive printer to stay one step ahead of costs related to environmental health and safety compliance – continual improvement is the key.

Periodically evaluating your practices and the status of all of your environmental health and safety requirements through a comprehensive Sustainable Management System (SMS) is a good business decision. It is important to review these programs at least annually and the SMS will help your company look more closely at your impacts to the environment and help build objectives and targets to help you continually improve in your environmental health and safety business practices.

Your goal is to go beyond compliance and reduce your liabilities and costs, improve your bottom line, and provide a better and safer environment for your employees and your community. The Compliance Certification for the Printing and Imaging Sector has been designed to help you conduct regular self-assessments, get back on track, and work towards continual improvement. The compliance certification checklists and workbook can help you evaluate your regulatory requirements, sustainable business and best management practices. Make a point to evaluate at least one sustainable idea or pollution prevention opportunity each year and move your company towards a more sustainable future, beyond compliance. A Sustainable Management System (SMS) can help you manage your environmental concerns, measure your performance and document your successes on the path to environmental leadership for your company. The 2008 Compliance Certification is voluntary but make sure you participate and help move your company towards a “Greener” future.

---

## Appendix A

---

### DEFINITIONS

**Accumulation** – accumulation of hazardous waste is different from “storage”. Accumulation time is the time allowed under RCRA to accumulate hazardous waste before a generator is required to transport the hazardous waste to a permitted treatment, storage, or disposal facility (TSDF). The allowable accumulation time period depends on your generator status. Allowable accumulation time periods are outlined in Section 6.7.

**Actual Uncontrolled Emissions** – actual air pollutant emissions before considering the efficiency of air pollution control equipment. Note: Your facility is billed an annual emissions fee based on uncontrolled actual emissions in tons per year and not on the quantity of air pollutant emissions requested on your air permit.

**Acutely Hazardous Waste** - Solid wastes determined to be very dangerous even in small amounts. Includes wastes listed in 6CCR 1007-3, Section 261.31 that are followed by the symbol (H), and all of the "P" wastes listed in Section 261.33 (e), that have been found to be fatal to humans in low doses e.g., some cyanide and mercury compounds. Few acutely hazardous wastes are generated in the printing sector.

**Aerosol** – material dispensed from its container as a mist, spray or foam by a propellant under pressure.

**Air Purifying Respirator (APR)** – a respirator that removes contaminants from the air by passing air through an air purifying filter before it reaches the user.

**Air Emissions** - any discharge or release of an air contaminant to the ambient air. For printers, air emissions can originate from press and screen cleaning solutions, coatings, adhesives, alcohol or alcohol substitutes and inks.

**Attainment areas** - Any area within Colorado in which the ambient air concentrations of any designated pollutants are in compliance with National Ambient Air Quality Standards (NAAQS).

**Audiometric tests** – testing of a person’s ability to hear various sound frequencies.

**Boiling point** – temperature at which the vapor pressure of a substance is equal to the external pressure (temperature a liquid turns into gas).

**Characteristic waste** – designated as characteristic because of constituents in the waste or the process generating the waste and has waste codes beginning with “D”:

**D001 – Ignitable**, any liquid waste that has a flashpoint below 140°F (60°C). Any non-liquid capable of spontaneous combustion under normal conditions. An ignitable compressed gas or oxidizer. Examples include blanket and roller washes, isopropyl alcohol, solvent-based coatings, and some contaminated rags.

**D002 – Corrosive**, an aqueous (water-based) material with a pH less than 2.0 or greater than 12.5. Examples include film/plate processing chemicals, acids, waste battery acid, and highly alkaline cleaners.

**D003 - Reactive**, unstable materials, potentially explosive or produce toxic gases when mixed with water, air or other incompatible materials. Examples include waste bleaches and oxidizers.

**D004 – Toxic**, contain specific chemicals above listed threshold levels. Typically determined using the Toxicity Characteristic Leaching Procedure or TCLP test. Examples include clean-up solvents, plate processing chemicals, and corrosive cleaners.

**Combustible** – a liquid whose flashpoint is above 37.8°C (100°F) but below 93.3°C (200°F).

**Stationary Internal Combustion Engine (ICE)** - Any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. A *stationary ICE is not a nonroad engine* as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition. Stationary ICE includes reciprocating ICE, rotary ICE, and other ICE except combustion turbines.

**Control Device** - the air pollution control equipment used to remove air pollutants generated by a source e.g., a heatset web press.

**Extremely Hazardous Substance (EHS)** – chemicals that present the most serious hazards during release (in terms of toxicity, reactivity, volatility, combustibility and flammability), regulated under the Emergency Planning and Community Right-To-Know Act (EPCRA). The list of EHS chemicals can be found in EPCRA, Section 302, 40 CFR, Part 355, appendices A & B. The EHS list consists of 360 substances and is included in EPA's List of Lists.

**Engineering controls** - help reduce exposure to potential hazards either by isolating the hazard or by removing it from the work environment. Engineering controls include mechanical ventilation and process enclosure. They are important because they are built into the work process.

**F-listed wastes** – specifically listed in the hazardous waste regulations at 6 CCR 1007-3, Section 261.31. These are generally spent cleaning solvents that contain 10% or more of at least one hazardous chemical. If the solvent is an ingredient and not being used for its solvent properties, it would not be an F-listed waste.

**Flammable** – material that ignites easily and burns rapidly with a flame.

**Flash point** - temperature at and above which a liquid gives off enough vapor to form an ignitable mixture with air.

**Fit Testing** – respirators that rely on a mask-to-face seal need to be annually checked to determine whether the mask provides an acceptable fit to a wearer.

**Guarding** - means shielded, fenced, or guarded by position or location.

**Hazardous Air Pollutant** - an air pollutant that presents, through inhalation or other routes of exposure, a threat of adverse human health effects (e.g., substances that are known to be, or may reasonably be anticipated to be carcinogenic, mutagenic, cause reproductive dysfunction or other adverse effects on health or on the environment).

**Hazardous Materials (HM)** – any material that is required to have a MSDS by OSHA. Examples of hazardous materials are gasoline, oil, diesel fuel, isopropyl alcohol, etc.

**Hazardous Substance (HS)** – chemicals posing a hazard to human health or the environment, regulated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) at 40 CFR 302. The HS list is included in EPA's List of Lists.

**Hazardous waste** – a solid, a liquid, or a contained gaseous material that is no longer used or that no longer serves the purpose for which it was produced and is either stored, disposed or recycled. A hazardous waste is either “listed” in the regulations or exhibits a hazardous “characteristic”, or a

combination of both. For printers, hazardous wastes can include press/screen cleaning solutions, untreated fixer, parts cleaning solvents, and solvent-based inks, coatings, or adhesives.

**Industrial stormwater permit** – industrial facilities that discharge industrial stormwater either directly to surface waters or indirectly, through a storm sewer system, must be covered by a permit allowing them to discharge. The SIC Code for the facility usually determines permit coverage.

**Industrial Wastewater** – any non-domestic wastewater resulting from a process of industry, manufacturing, trade or business, regardless of volume or pollutant content.

**Listed wastes** – designated as listed wastes because of constituents in the waste or the process generating the waste and have waste codes beginning with “F”, “P”, “U”, or “K”. The U and P listed wastes are for those discarded, unused commercial chemical products that are either 100% pure, technical grade or any formulation where the chemical is the active ingredient. K-listed wastes are those from specific industrial manufacturing processes such as lead chrome pigment manufacturing. Of the U, P, or K listed wastes, the only wastes that could be generated by printers are those on the U list (refer to Appendix A).

**List of Lists (LOL)** – EPA has published a “List of Lists” that is a compendium of the lists of chemical subject to reporting requirements. The LOL includes CERCLA HSs and EPCRA EHSs as well as EPCRA 313 Toxic Chemicals and CAA 112R regulated chemicals for accidental release prevention

**Major Source** – a stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit, considering controls, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.

**Nip point** – point where two gears mesh which can pinch or crush fingers or other body parts.

**No Exposure** – No industrial materials or activities are exposed to stormwater.

**Non-attainment areas** – any area within Colorado in which the ambient air concentrations of any designated pollutants are out of compliance with the National Ambient Air Quality Standards (NAAQS).

**Non-domestic wastewater** - wastewater that is not from a domestic source (e.g., bathrooms, kitchens, etc.).

**Nonhazardous waste** – a waste that does not meet the requirements of a hazardous waste as defined above.

**NRR** – Noise Reduction Rating, represents the NRR approximate dB(A) noise reduction afforded by the protector.

**OSHA** – Occupational Safety and Health Administration. OSHA regulations for general industry are outlined in 29 CFR 1910.

**Permissible exposure limits (PEL)** – regulatory limits on the amount or concentration of a substance in the air.

**Personal protective equipment** – specialized clothing or equipment worn by employees for protection against health and safety hazards.

**Pinch point** – point at which it is possible for a part of the body to be caught between moving parts or between moving and stationary parts of a piece of equipment.

**Point Source Discharge** – stormwater that has come into contact with industrial materials and/or activities and is discharged to surface waters or storm sewers.

**Pollution Prevention (P2)** – reduction or elimination of discharges or emissions to the environment. P2 can be accomplished by eliminating or reducing the generation of wastes at the source or by using, reusing, or reclaiming wastes once they are generated.

**POTW** – Publicly Owned Treatment Works means a treatment facility by a District such as Metro District. The treatment works includes any sewers that convey wastewater to the POTW treatment plant.

**Pretreatment** - reduction or elimination in the amount of pollutants or alteration of pollutant properties in wastewater to a less harmful state prior to or in lieu of discharging such pollutants into a POTW.

**RCRA** – Resource Conservation and Recovery Act. The federal Hazardous Waste regulations listed in 40 CFR Part 261-265.

**Reportable Quantities (RQ)** – applies to the amount of Hazardous Substances (HSs) or Extremely Hazardous Substances (EHSs) released within a 24-hour period. Note that the 24-hour period is the time frame for *measuring the quantity released, not the time frame for reporting a release*. RQs are included in EPA's List of Lists.

**Rolling 12-month** – last consecutive 12-month period of time.

**Secondary containment** - containment external to the primary container; a system installed so that any material that is discharged or has leaked from the primary container is prevented from reaching the soil or ground water outside the system. Secondary containment should be able to contain 110% of the contents of the primary container.

**SIC Code** – Standard Industrial Classification Codes (SIC) are assigned to the primary activities performed by a company. Manufacturing industries are generally represented by SIC Codes 20-39. A two-digit code, such as 26 or 27 for printers, means that all industries under that heading are covered.

**Storage** – the maximum quantity of hazardous waste maintained onsite at any given time. The maximum allowable storage quantity is also determined by generator status.

**Sustainability** - the ability to provide for the needs of the world's current population without damaging the ability of future generations to provide for themselves. When a process is sustainable, it can be carried out over and over without negative environmental effects or impossibly high costs to anyone involved.

**SWMP** – Stormwater Management Plan. The SWMP identifies potential pollutant sources at the facility, assesses the potential of these sources to contribute pollutants from industrial activities to stormwater, and describes appropriate best management practices implemented at the facility to reduce the potential of these sources to contribute pollutants to stormwater discharges.

**TLV** – threshold limit value; airborne concentration of a substance below which all workers are believed to be protected while exposed to it day after day for 8-hour periods.

**TWA** – time weighted average, the average amount of a substance you can be exposed to over an eight-hour day.

**Universal Waste** - low risk hazardous waste generated by a variety of people. This waste has three categories: CRTs, thermostats, batteries and lamps (fluorescent tubes, discharge lamps, mercury vapor lamps, batteries (not auto), and mercury thermostats. This waste must be disposed of properly.

**Used Oil** - any oil that has been refined from crude oil, or any synthetic oil that has been used and, as a result of such use, is contaminated by physical or chemical impurities e.g., motor oil and refrigeration oils.

**U.S. EPA Method 24** – EPA standard analytical sampling method for determination of VOC matter content, density, volume solids, and weight solids of surface coatings.

**Volatile Organic Compound (VOC)** – organic compounds (containing carbon) that react with nitrogen oxides to form ozone, a regulated pollutant in Colorado. Ozone in the lower atmosphere combines with particles of dust and other materials and contributes to smog formation.

## Appendix B

<b>SUSTAINABLE BUSINESS (POLLUTION PREVENTION) PRACTICES</b>	
<input checked="" type="checkbox"/>	<b>Review Material Safety Data Sheets (MSDS)</b> before purchasing a product. The MSDS provides key environmental, health and safety information. Know before you buy! Remember to maintain current copies of MSDSs for all chemicals in your shop.
<input checked="" type="checkbox"/>	<b>Start by paying attention to what you use.</b> Examine your use of materials by process. Are there new technologies that can replace your existing process or materials and reduce toxics, volatile organic compound (VOC) emissions or waste?
<input checked="" type="checkbox"/>	<b>Inventory reduction.</b> Make one person responsible for chemical purchases and inventory control in your department. Decisions should be made on a basis of product performance, environmental and safety requirements, and cost. Store chemicals in a central location. Coordinate your purchasing with environmental recordkeeping so you can track chemical use and wastes to identify reduction opportunities.
<input checked="" type="checkbox"/>	<b>Inventory control.</b> Conduct an inventory to reduce the type and quantity of chemicals used in your shop. Avoid accepting samples from different suppliers and have them take back unused samples. Use multi-task products as much as possible. Date all materials and use the first-in, first-out method of inventory control. Purchase frequently used materials in larger containers.
<input checked="" type="checkbox"/>	<b>Ink management.</b> Use existing stocks whenever possible. For example, consider offering discounts for smaller jobs using leftover inks. Blend and reuse current ink supplies instead of disposing of them. Utilize an ink mixing system. Use inks with pigments that do not contain heavy metals. Keep ink containers closed to minimize solvent evaporation and control ink temperature and run ability.
<input checked="" type="checkbox"/>	<b>Reduce your cleaning solvent usage</b> by improving your solvent management practices and replacing quickly evaporating washes with alternatives that are either low VOC or have low vapor pressure (<10 mm Hg at 68°F). Avoid using F-listed solvents and those with flashpoints below 140°F. Dispense cleaning solvent with a squirt bottle instead of pouring directly from the container to control application rate and reduce evaporation. Consider installing non-liquid type of automatic blanket wash systems.
<input checked="" type="checkbox"/>	<b>Use low or zero VOC fountain solutions.</b> Replace isopropyl alcohol with alcohol substitutes and avoid chemicals such as glycol ethers or ethylene glycol that are classified as hazardous air pollutants.
<input checked="" type="checkbox"/>	<b>Use a laundry service for rags.</b> After use, remove excess liquids and store in a fireproof container. Gravity drain or use other methods to remove excess solvents prior to laundering.
<input checked="" type="checkbox"/>	<b>Routinely clean and maintain presses.</b> Regular maintenance, cleaning and adjustments of rollers, cylinders and other key press components will reduce cleaner consumption and prevent buildup of inks, dust and other debris that can reduce print quality.
<input checked="" type="checkbox"/>	<b>Conserve water.</b> Have the local water utility or water conservation service conduct a water audit of your facility. Establish a preventative maintenance schedule to ensure maximum efficiency of water-using appliances and equipment. Replace high-flow toilets with water-efficient 1.6 gallons or less per flush models. Install low-flow aerators as low as 0.5 gallons per minute for lavatory sinks.
<input checked="" type="checkbox"/>	<b>Recycle.</b> Recycle glass, plastic bottles (#1 and 2), aluminum and steel cans, newspapers, office paper, direct mail and cardboard. Recycle all computers, electronics, toner and inkjet cartridges. Use office paper, toilet tissues, paper towels and paper napkins that contain 30% post-consumer recycled content.
<input checked="" type="checkbox"/>	<b>Conserve energy.</b> Ask your energy company or an energy service to conduct an energy assessment of your facility. Install a programmable thermostat and use the night setback. Use an energy management system to control lighting, heating and cooling. Turn off computers, monitors, printers, copiers and other small appliances such as coffee machines when they are not in use. Use indoor and outdoor sensor lighting.
<input checked="" type="checkbox"/>	<b>Educate your staff.</b> Document your operating procedures including waste reduction and recycling measures. Educate and train staff on purchasing, handling, recycling, and maintenance procedures. Develop an environmental health and safety policy and get buy-in from staff and management.
<input checked="" type="checkbox"/>	<b>Consider xeriscaping.</b> Limit lawn areas. Install low-volume irrigation, use ground cover, mulch or drought-resistant plants; and water only when needed.
<input checked="" type="checkbox"/>	<b>Expand “green” fleets.</b> When replacing light-duty vehicles, replace with hybrids or the highest efficiency vehicles available. Shift diesel vehicles to biodiesel fuel, if feasible.
<input checked="" type="checkbox"/>	<b>Promote your Actions.</b> Let your customers know that you are working toward becoming a “Green Printer”. Let your colleagues know about your accomplishments.

## Appendix C

HAZARDOUS WASTE GENERATOR REQUIREMENTS – SUMMARY TABLE			
GENERATOR REQUIREMENT	GENERATOR CATEGORY		
	Conditionally Exempt Small Quantity Generator (CESQG)	Small Quantity Generator (SQG)	Large Quantity Generator (LQG)
Hazardous Waste Determination	Required through process knowledge or analysis (supporting documentation recommended)	Required through process knowledge or analysis (supporting documentation required)	Required through process knowledge or analysis (supporting documentation required)
On-site Storage & Disposal	Part "B" Permit required	Part "B" Permit required	Part "B" Permit required
Monthly Generation Rate	< 1 kg of acutely HW < 100 kg of HW *	< 1 kg of acutely HW > 100 kg but < 1,000 kg of HW *	> 1 kg of acutely HW > 1,000 kg of HW *
Maximum Accumulation	< 1 kg of acutely HW < 1,000 kg of HW *	< 1 kg of acutely HW < 6,000 kg of HW *	<b>No limit</b>
On-site Treatment	Unrestricted (Knowledge of proper & safe treatment methods implied)	Part "B" Permit, Permit-by-Rule, Treat in WWTU or Treat to meet LDR	Part "B" Permit, Permit-by-Rule, Treat in WWTU or Treat to meet LDR
Accumulation Time Period	<b>None</b>	180 days or 270 days if TSD facility is > 200 miles away (30 day extension available)	90 days (30 day extension available)
EPA ID Number	Required if generate >3 gal/yr hazardous waste codes F001, F002, F004 and/or F005	Required	Required
Manifests & LDR	Not Required (recommended)	Required	Required
Exception Reports	Not Required (recommended)	Notify CDPHE within 60 days & include a copy of the Manifest	Contact handler within 35 days, Report to CDPHE within 45 days
Biennial Reports	Not Required	<b>Not Required</b>	Required (March 1 <sup>st</sup> of even numbered year)
Contingency Plan	Not Required (recommended)	Basic Plan Required	Written Plan Required
Container Management	Not Required (recommended)	Good Condition, Compatible with Waste, Labeled as Haz. Waste, Aisle Space, Lids, Weekly Inspections & Acc. Start Date <u>unless</u> at Satellite Accumulation Area	Good Condition, Compatible with Waste, Labeled as Haz. Waste, Aisle Space, Lids, Weekly Inspections & Acc. Start Date <u>unless</u> at Satellite Accumulation Area, <b>Subparts AA, BB &amp; CC apply</b>
Tank Management	Not Required (recommended)	Good Condition, Compatible with Waste, Labeled as Haz. Waste, Acc. Start Date Tracked & Daily Inspections	Good Condition, Compatible with Waste, Labeled as Haz. Waste, Acc. Start Date Tracked, Daily Inspections. <b>Subparts AA, BB &amp; CC apply &amp; Secondary Containment is Required</b>
Personnel Training	Not Required (recommended)	Basic Training Required	<b>Written Training Plan Required</b>
Record Keeping	Disposal Receipts & Waste Analysis Records (recommended)	Manifests, LDR & Waste Analysis Records	Manifests, LDR, Waste Analysis Records, Training Records, Biennial Reports & Exception Reports
1 kg ~ 1 qt 100 kg ~ 27 gal (~ ½ of a 55 gal drum) or 220 lbs, depending on material 1,000 kg ~ 270 gal (~ 5/55 gal drums) or 2,200 lbs, depending on material 6,000 kg ~ 1,620 gal (~30/55 gal drums) or 13,200 lbs, depending on material For liquids, specific gravity X 8.er lb./gallon - density			

**Characteristics of Hazardous Waste**

<b><u>Characteristic</u></b>	<b><u>Criteria Of Characteristic Waste</u></b>	<b><u>Possible Printing-Related Sources</u></b>	<b><u>Waste Code</u></b>
Ignitability	<ul style="list-style-type: none"> <li>• A liquid (except solutions containing less than 24% alcohol) that has a flash point below 140°F (60°C); or</li> <li>• A non-liquid capable of spontaneous and sustained combustion under normal conditions; or</li> <li>• An ignitable compressed gas (as defined by DOT); or</li> <li>• An oxidizer (as defined by DOT)</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical products such as blanket and roller washes, cleanup solvents, isopropyl alcohol, and inks.</li> <li>• Shop towels being thrown out for disposal</li> </ul>	D001
Corrosivity	<ul style="list-style-type: none"> <li>• An aqueous material with a pH less than 2.0 or greater than or equal to 12.5; or</li> <li>• A liquid that corrodes steel at a rate greater than ¼ inch per year at a temperature of 130°F (55°C)</li> </ul>	<ul style="list-style-type: none"> <li>• Plate and film processing chemicals, particularly etching chemicals. Acids, waste battery acid, and alkaline cleaners, depending on their pH.</li> </ul>	D002
Reactivity	<ul style="list-style-type: none"> <li>• Normally unstable and reacts violently without detonating; or</li> <li>• Reacts violently or forms an explosive mixture with water; or</li> <li>• Generates toxic gases, vapor, or fumes when mixed with water; or</li> <li>• Contains cyanide or sulfide and generates toxic gas vapors or fumes at a pH between 2 and 12.5.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste bleaches and oxidizers</li> </ul>	D003
Toxicity	<ul style="list-style-type: none"> <li>• Contains specific toxic contaminants above threshold levels;</li> <li>• waste should be tested</li> </ul>	<ul style="list-style-type: none"> <li>• Waste fixer, plate processing chemicals, ink, and cleanup solvents, and specific pesticides.</li> </ul>	D004-D043

**List of Chemicals Regulated by TCLP (Toxic)**

<u>Organics</u>	<u>Regulatory Levels</u>	<u>Waste Code</u>	<u>Metals</u>	<u>Regulatory Levels</u>	<u>Waste Code</u>
Benzene	0.50 ppm	D018	Arsenic	5.0 ppm	D004
Carbon tetrachloride	0.50 ppm	D019	Barium	100.0 ppm	D005
Chlordane	0.03 ppm	D020	Cadmium	1.0 ppm	D006
Chlorobenzene	100.0 ppm	D021	Chromium	5.0 ppm	D007
Chloroform	6.0 ppm	D022	Lead	5.0 ppm	D008
Cresol	200.0 ppm	D026	Mercury	0.2 ppm	D009
m-Cresol	200.0 ppm	D024	Selenium	1.0 ppm	D010
o-Cresol	200.0 ppm	D023	Silver	5.0 ppm	D011
p-Cresol	200.0 ppm	D025			
1,4-Dichlorobenzene	7.5 ppm	D027			
1,2-Dichloroethane	0.50 ppm	D028			
1,1-Dichloroethylene	0.70 ppm	D029			
2,4-Dinitrotoluene	0.13 ppm	D030			
Heptachlor (and its epoxide)	0.008 ppm	D031			
Hexachlorobutadiene	0.5 ppm	D033			
Hexachlorobenzene	0.13 ppm	D032			
Hexachloroethane	3.0 ppm	D034			
Methyl ethyl ketone	200.0 ppm	D035			
Nitrobenzene	2.0 ppm	D036			
Pentachlorophenol	100.0 ppm	D037			
Pyridine	5.0 ppm	D038			
Tetrachloroethylene	0.7 ppm	D039			
Trichloroethylene	0.5 ppm	D040			
2,4,5-Trichlorophenol	400.0 ppm	D041			
2,4,6-Trichlorophenol	2.0 ppm	D042			
Vinyl chloride	0.20 ppm	D043			
Endrin	0.02 ppm	D012			
Lindane	0.4 ppm	D013			

**Possible EPA Toxic Characteristic Contaminants Found in Printing Waste**

<u>Contaminant</u>	<u>Waste Code</u>	<u>Regulatory Threshold</u>	<u>Contaminant</u>	<u>Waste Code</u>	<u>Regulatory Threshold</u>
Barium	D005	100.0 ppm	Silver	D011	5.0 ppm
Benzene	D018	0.5 ppm	Trichloroethylene	D039	0.5 ppm
Chromium	D007	5.0 ppm	Vinyl chloride	D043	0.2 ppm
Carbon tetrachloride	D019	0.5 ppm			
Methyl ethyl ketone	D035	200.0 ppm			

**Examples of F-Listed Wastes**

**F001** The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10% or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

**F002** The following spent halogenated solvents: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of 10% or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

**F003** The following ignitable non-toxic solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing before use, one or more of the above non-halogenated solvents, and a total of 10% or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

**F004** Toxic non-halogenated solvents: Aerosols, cresylic acid and nitrobenzene, all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of 10% or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

**F005** The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of 10% or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

**Possible U-Listed Wastes Found In Printing Waste**

<u>Name/Description</u>	<u>Waste Code</u>	<u>Name/Description</u>	<u>Waste Code</u>
Acetone	U002	Methyl chloroform	U226
Benzene	U019	Methylene chloride	U080
Carbon tetrachloride	U211	Methyl ethyl ketone (MEK)	U159
Chromium	U007	Methyl isobutyl ketone	U161
Cumene	U055	Tetrachloroethylene	U210
Cyclohexane	U056	(perchloroethylene)	
Dibutyl phthalate	U069	Toluene	U220
Ethyl acetate	U112	Toluene diisocyanate	U223
Ethanol, 2-ethoxy	U359	Trichloroethylene	U228
Ethylene glycol monoethyl ether	U359	Vinyl chloride	U043
Formaldehyde	U122	Xylene	U239
Methanol	U154		

## Emergency Contacts Telephone Posting

Post this sheet near the telephone(s) in areas where hazardous waste is handled or stored

<b>Company Emergency Coordinator(s)</b>	<b>Work Phone</b>	<b>Pager # or Home Phone</b>
_____	_____	_____
_____	_____	_____
<b>Fire Department</b>		Phone _____
<b>Police Department</b>		Phone _____
<b>Hospital</b>		Phone _____
<b>Colorado 24-hour Emergency Response Line</b>		Phone <u>1-877-518-5608</u>
<b>National Response Center (24-hour)</b>		Phone <u>1-800-424-8802</u>

### Location of Emergency Response Equipment

**\*Fire extinguishers** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**\*Fire alarm (if present)** \_\_\_\_\_

**\*Spill control material** \_\_\_\_\_

**\*Special equipment (if present)** \_\_\_\_\_  
\_\_\_\_\_

(Fulfills emergency contact telephone posting requirements for SQG's)

## Appendix D

### NEGLIGIBLY REACTIVE VOLATILE ORGANIC COMPOUNDS (NRVOCs)

- Methyl Acetate
- Acetone
- Methane Ethane
- Methylene Chloride (Dichloromethane)
- 1,1,1-Trichloroethane (Methylchloroform)
- 1,1,2-Trichloro-1,2,2-Trifluoroethane (CFC-113)
- Trichlorofluoromethane (CFC-11)
- Dichlorodifluoromethane (CFC-12)
- Chlorodifluoromethane (HCFC-22)
- Trifluoromethane (HFC-23)
- 1,2-Dichloro 1,1,2,2-Tetrafluoroethane (CFC-114)
- Chloropentafluoroethane (CFC-115)
- 1,1,1-Trifluoro 2,2-Dichloroethane (HCFC-123)
- 1,1,1,2-Tetrafluoroethane (HCFC-134A)
- 1,1-Dichloro 1-Fluoroethane (HCFC 141B)
- 1-Chloro 1,1-Difluoroethane (HCFC-142B)
- 2-Chloro-1,1,1,2-Tetrafluoroethane (HCFC-124)
- Pentafluoroethane (HFC-125)
- 1,1,2,2-Tetrafluoroethane (HFC-134)
- 1,1,1-Trifluoroethane (HFC-143A)
- 1,1-Difluoroethane (HFC-152A)
- Parachlorobenzotrifluoride (PCBTF)
- Cyclic, Branched, or linear completely methylated siloxanes
- Perchloroethylene (Tetrachloroethylene)
- 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)
- 1,3-dichloro-1.1.2.2.3-pentafluoropropane (HCFC-225cb)
- 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee)
- Difluoromethane (HFC-32)
- Ethylfluoride (HFC-161)
- 1,1,1,3,3,3-hexafluoropropane (HFC-236fa)
- 1,1, 2, 2,3-pentafluoropropane (HFC-245ca)
- 1,1,2,3,3-pentafluoropropane (HFC-245ea)
- 1,1,1,2,3-pentafluoropropane (HFC-245eb)
- 1,1,1,3,3-pentafluoropropane (HFC-245fa)
- 1,1,1,2,3,3-hexafluoropropane (HFC-236ea)
- 1,1,1,3,3-pentafluorobutane (HFC-365mfc)
- Chlorofluoromethane (HCFC-31)
- 1 chloro-1-fluoroethane (HCFC-151a)
- 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)
- 1,1,1,2,2,3,3,4,4-nonfluoro-4-methoxy-butane (C4F9OCH3)
- 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ((CF3)2CFCF2OCH3)
- 1-ethoxy-1,1,2,2,3,3,4,4,4-nonfluorobutane (C4F9OC2H5)
- 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ((CF3)2CFCF2OC2H5)
- 1,1,1,2,2,3,3,-heptafluoro-3-methoxy-propane
- 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2(trifluoromethyl)hexane
- 1,1,1,2,3,3,3-heptafluoropropane methyl formate,
- Tertiary Butyl Acetate (2-Butanone), and
- Perfluorocarbon Compounds in these categories:
  - Cyclic Branched or Linear, Completely Fluorinated Alkanes
  - Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations
  - Cyclic, Branched, or Linear, Completely Fluorinated Tertiary amines with no unsaturations
  - Sulfur containing Perfluorocarbons with no Unsaturations and with Sulfur Bonds only to Carbon and Fluorine

**LIST OF HAPS AND METHOD FOR IDENTIFYING HAP REPORTING THRESHOLDS**

**AIR CONTAMINANT EMISSIONS NOTICES FROM APPENDIX A, REGULATION NO. 3  
Method for Determining De Minimis Levels For Non-criteria Reportable Pollutants**

The following procedures must be followed in order to determine the appropriate de minimis (minimum) reporting level for each pollutant that is emitted from each emission point at a contiguous site. If you do not wish to use the three-scenario approach at your facility, you may elect to use Scenario 1 for all emission points.

**DEFINITIONS**

Release Point - the lowest height above ground level from which the pollutants are emitted to the atmosphere.

Property Boundary - the distance from the base of the release point to the nearest property boundary.

Point - an individual emission point or a group of individual emission points reported on one Air Pollutant Emission Notice as provided for in Part A, section II.B.4.

**METHODOLOGY**

To determine the de minimis level for a single pollutant being emitted from a point (single or grouped).

**STEP 1:**

Determine which of the three scenarios below applies to the emission point. If different scenarios can be applied to the same emission point, use the highest numbered scenario that applies. In the case of grouped emission points, use the lowest scenario number (for the entire group) that applies to any of the single emission points within the group.

Scenario 1: Release point less than 10 meters or property boundary less than 100 meters;

Scenario 2: Release point equal to or greater than 10 meters, but less than 50 meters, or property boundary equal to or greater than 100 meters, but less than 500 meters; or

Scenario 3: Release point equal to or greater than 50 meters, or property boundary equal to or greater than 500 meters.

**STEP 2:**

Use Appendix B to identify which of the three bins (Bin A, B, or C) the chemical is listed under.

If the pollutant is not listed, it does not have to be reported unless it is included in a chemical compound group.

**STEP 3:**

Use the table below to determine the de minimis level. All values are in pounds per year.

Chemical Bin	<u>Scenario 1</u> De Minimis	<u>Scenario 2</u> De Minimis	<u>Scenario 3</u> De Minimis
Bin A	50	125	250
Bin B	500	1250	2500
Bin C	1000	2500	5000

**STEP 4:**

Repeat the above steps for each pollutant emitted from each emission point (single or grouped). One Air Pollutant Emission Notice must be filed for each emission point that emits one or more chemicals above the de minimis level.

**LIST OF HAPS****REGULATION NO. 3  
AIR CONTAMINANT EMISSIONS NOTICES****-APPENDIX B-****Non-criteria Reportable Pollutants (Sorted Alphabetically)**

Note: HAP means federal, or federal and state hazardous air pollutant  
 HAPs means state-only hazardous air pollutant  
 No Designation means not a HAP, but still reportable.

<b><u>LIST OF HAPS</u></b>			
CAS		Toxics	BIN
HAP	71556	1,1,1-Trichloroethane (Methyl chloroform)	C
HAP	79345	1,1,2,2-Tetrachloroethane	A
HAP	79005	1,1,2-Trichloroethane	A
HAP	75354	1,1-Dichloroethylene (Vinylidene chloride)	A
HAP	57147	1,1-Dimethyl hydrazine	A
HAP	120821	1,2,4-Trichlorobenzene	A
HAP	96128	1,2-Dibromo-3-chloropropane	A
HAP	122667	1,2-Diphenylhydrazine	A
HAP	106887	1,2-Epoxybutane	A
HAP	75558	1,2-Propylenimine (2-Methyl aziridine)	A
HAP	106990	1,3-Butadiene	A
HAP	542756	1,3-Dichloropropene	A
HAP	1120714	1,3-Propane sultone	B
HAPs	55981	1,4-Butanediol dimethanesulphonate	A
HAPs	7644410	1,4-Dichloro-2-butene	A
HAP	106467	1,4-Dichlorobenzene	A
HAP	123911	1,4-Dioxane (1,4-Diethyleneoxide)	A
HAP	540841	2,2,4-Trimethylpentane	C
HAP	1746016	2,3,7,8-TCDD (Dioxin)	A
HAP	95954	2,4,5-Trichlorophenol	C
HAP	88062	2,4,6-Trichlorophenol	A
HAP	94757	2,4-D, salts and esters (2,4-Dichlorophenoxyacetic acid)	A
HAP	51285	2,4-Dinitrophenol	A
HAP	121142	2,4-Dinitrotoluene	A
HAP	95807	2,4-Toluene diamine	B
HAP	584849	2,4-Toluene diisocyanate	A
	91087	2,6-Toluene diisocyanate	A
HAP	53963	2-Acetylaminofluorene	C
HAPs	132274	2-Biphenylol sodium salt	B
HAP	532274	2-Chloroacetophenone	A

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
HAP	79469	2-Nitropropane	A
HAPs	60153493	3-(N-Nitrosomethylamine) (Propionitrile)	B
HAP	91941	3,3-Dichlorobenzidine	A
HAP	119904	3,3-Dimethoxybenzidine	A
HAP	119937	3,3'-Dimethyl benzidine	A
HAP	101144	4,4-Methylene bis (2-chloroaniline)	A
HAP	101779	4,4-Methylenedianiline	A
HAP	534521	4,6-Dinitro o-cresol, and salts	A
HAP	92671	4-Aminobiphenyl	A
HAP	92933	4-Nitrobiphenyl	C
HAP	100027	4-Nitrophenol	C
HAP	75070	Acetaldehyde	A
HAP	60355	Acetamide	B
HAP	75058	Acetonitrile	A
HAP	98862	Acetophenone	C
HAP	107028	Acrolein	A
HAP	79061	Acrylamide	A
HAP	79107	Acrylic acid	A
HAP	107131	Acrylonitrile	A
	814686	Acrylyl chloride	C
HAPs	1402682	Aflatoxins	A
	116063	Aldicarb (Temik)	A
HAPs	309002	Aldrin	A
	107186	Allyl alcohol	A
HAP	107051	Allyl chloride	A
	20859738	Aluminum phosphide	A
	54626	Aminopterin	C
	78535	Amiton	C
	3734972	Amiton oxalate	C
	7664417	Ammonia	B
HAP	62533	Aniline	A
	88051	Aniline,2,4,6-Trimethyl	C
HAP	0	Antimony compounds	A
	1397940	Antimycin A	C
	86884	ANTU (alpha-naphthylthiourea)	A
HAP	0	Arsenic compounds	A
HAP	1332214	Asbestos	A
HAP	71432	Benzene	A

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
HAP	92875	Benzidine (p-Diamino diphenyl)	A
HAP	98077	Benzotrichloride	A
HAP	100447	Benzyl chloride, (Chloromethyl)benzene	A
HAP	0	Beryllium compounds	A
HAP	92524	Biphenyl	C
HAP	117817	Bis(2-ethylhexyl) phthalate (DEHP) (Diocetyl phthalate)	A
	534076	Bis(chloromethyl)ketone	C
HAP	542881	Bischloromethyl ether	A
	10294345	Boron trichloride	C
	7726956	Bromine	A
	28772567	Bromodiolone	C
HAP	75252	Bromoform	A
HAP	0	Cadmium compounds	A
HAP	156627	Calcium cyanamide	A
HAP	133062	Captan	A
HAP	63252	Carbaryl	C
	1563662	Carbofuran	A
HAP	75150	Carbon disulfide	A
HAP	56235	Carbon tetrachloride	A
HAP	463581	Carbonyl sulfide	C
	786196	Carbophenothion	C
HAP	120809	Catechol	A
HAP	133904	Chloramben (3-amino-2,5-dichloro benzoic acid)	A
HAP	57749	Chlordane	A
HAPs	115286	Chlorendic acid	B
	470906	Chlorfenvinfos	C
HAPs	108171262	Chlorinated paraffins (C12, 60% chlorine)	B
HAP	7782505	Chlorine	A
	24934916	Chlormephos	C
HAP	79118	Chloroacetic acid	A
HAP	108907	Chlorobenzene	A
HAP	510156	Chlorobenzilate (ethyl-4,4'-dichlorobenzilate)	B
	107073	Chloroethanol	A
HAP	67663	Chloroform (Trichloromethane)	A
HAP	107302	Chloromethyl methyl ether	A
	3691358	Chlorophacinone	C
HAP	126998	Chloroprene (2-Chloro-1,3-butadiene)	A
	1982474	Chloroxuron	C

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
	21923239	Chlorthiophos	C
HAP	0	Chromium compounds (incl. 6+ compounds, etc.)	A
HAPs	117102	Chrysazin (Dorbane)	B
HAPs	2646175	CI Solvent Orange 2	B
HAP	0	Cobalt compounds (as cobalt metal dust and fumes)	A
HAP	0	Coke Oven Emissions	A
	56724	Coumaphos	C
	5836293	Coumatetralyl	C
HAP	1319773	Cresylic acid/Cresols	A
	535897	Crimidine	C
	4170303	Crotonaldehyde	A
	123739	Crotonaldehyde (E)	A
HAP	98828	Cumene	A
HAP	0	Cyanide compounds	A
	675149	Cyanuric fluoride	C
	66819	Cyclohexamide	C
	108918	Cyclohexylamine	C
HAP	3547044	DDE (Dichlorodiphenyldichloroethylene)	A
	8065483	Demeton	A
	919868	Demeton-s-methyl	C
	10311849	Dialifor	C
HAP	334883	Diazomethane	A
HAP	132649	Dibenzofurans	C
	19287457	Diborane	A
HAP	84742	Dibutyl phthalate	C
HAP	111444	Dichloroethyl ether (Bis(2-chloroethyl)ether)	A
	149746	Dichloromethylphenylsilane	C
HAP	62737	Dichlorvos	A
	141662	Dicrotophos	A
HAPs	60571	Dieldrin	A
	1464535	Diepoxybutane	B
HAP	111422	Diethanolamine	A
HAP	64675	Diethyl sulfate	B
	1642542	Diethylchlorophosphate	B
	115264	Dimefox	A
	60515	Dimethoate	A
HAP	60117	Dimethyl aminoazobenzene	B
HAP	79447	Dimethyl carbamoyl chloride	B

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
HAP	131113	Dimethyl phthalate	C
HAP	77781	Dimethyl sulfate	A
	75183	Dimethyl sulfide (Methyl sulfide)	C
HAP	68122	Dimethylformamide	A
	2524030	Dimethylphosphorochloridothioate	C
	99989	Dimethyl-p-phenylenediamine	C
	644644	Dimetilan	C
	1420071	Dinoterb	C
	78342	Dioxathion	A
	82666	Diphacinone	C
	152169	Diphosphoramidate, octamethyl	A
HAPs	2475458	Disperse Blue 1	B
	298044	Disulfoton	A
	541537	Dithiobiuret	C
	115297	Endosulfan	A
	2778043	Endothion	C
	72208	Endrin	A
HAP	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	A
	563122	Ethion	A
	13194484	Ethoprophos (Ethoprop)	C
HAP	140885	Ethyl acrylate	A
	2642719	Ethyl azinphos	C
HAP	100414	Ethyl benzene (Phenylethane)	C
	538078	Ethyl bis (2-chloroethyl)amine	C
HAP	51796	Ethyl carbamate (Urethane)	B
HAP	75003	Ethyl chloride (Chloroethane)	C
	107153	Ethylene diamine	C
HAP	106934	Ethylene dibromide (1,2-Dibromoethane)	A
HAP	107062	Ethylene dichloride (1,2-Dichloroethane)	A
	371620	Ethylene fluorohydrin	C
HAP	107211	Ethylene glycol	C
HAP	151564	Ethylene imine (Aziridine)	A
HAP	75218	Ethylene oxide	A
HAP	96457	Ethylene thiourea	A
HAP	75343	Ethylidene dichloride (1,1-Dichloroethane)	B
	542905	Ethylthiocyanate	C
	22224926	Fenaminophos (Fenamiphos)	A
	122145	Fenitrothion	C

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
	115902	Fensulfothion	A
HAP	0	Fine mineral fibers	A
	4301502	Fluenetil	C
	144490	Fluoracetic acid	B
	7782414	Fluorine	C
	640197	Fluoroacetamide	C
	359068	Fluoroacetyl chloride	C
	944229	Fonofos	A
HAP	50000	Formaldehyde	A
	23422539	Formotamate hydrochloride	C
	2540821	Formothion	C
	17702577	Formparanate	C
	21548323	Fosthietan	C
	3878191	Fuberidazole	C
	110009	Furan	A
HAP	0	Glycol ethers	A
HAP	76448	Heptachlor	A
HAP	118741	Hexachlorobenzene	A
HAP	87683	Hexachlorobutadiene	A
HAP	77474	Hexachlorocyclopentadiene	A
HAP	67721	Hexachloroethane	A
HAP	822060	Hexamethylene-1,6-diisocyanate	A
	4835114	Hexamethylenediamine, N,N-dibutyl	C
HAP	680319	Hexamethylphosphoramide	B
HAP	110543	Hexane	C
HAP	302012	Hydrazine	A
HAP	7647010	Hydrochloric acid (Hydrogen chloride)	A
HAP	7664393	Hydrogen fluoride (Hydrofluoric acid)	A
	7783064	Hydrogen sulfide	A
HAP	123319	Hydroquinone	C
	297789	Isobenzan	C
	465736	Isodrin	A
	55914	Isofluorophate	B
HAP	78591	Isophorone	A
	4098719	Isophorone diisocyanate	A
	108236	Isopropyl chlorformate	C
	625558	Isopropyl formate	C
	119380	Isopropylmethylpyrazolyl dimethylcarbamate (Isolan)	C

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
HAPs	64091914	Ketone, 3-pyridyl-3-(N-methyl-N-nitrosoamino) propyl	B
HAP	0	Lead compounds (except elemental lead)	A
	21609905	Leptophos	C
HAP	-	Lindane (all isomers of hexachlorocyclohexane)	A
HAP	108316	Maleic anhydride	C
HAP	0	Manganese compounds	A
HAP	108394	m-Cresol	B
	950107	Mephosfolan	A
HAP	0	Mercury compounds	A
	126987	Methacrylonitrile	A
	10265926	Methamidophos	A
HAP	67561	Methanol (Methyl alcohol)	C
	950378	Methidathion	A
	2032657	Methiocarb	C
	16752775	Methomyl	B
HAP	72435	Methoxychlor	A
	86500	Methyl azinphos	A
HAP	74839	Methyl bromide (Bromomethane)	A
HAP	74873	Methyl chloride (Chloromethane)	A
	79221	Methyl chloroformate	B
	624920	Methyl disulfide	C
HAP	60344	Methyl hydrazine	A
HAP	74884	Methyl iodide (Iodomethane)	A
HAP	108101	Methyl isobutyl ketone (MIBK) (Hexone)	B
HAP	624839	Methyl isocyanate	A
	556616	Methyl isothiocyanate	C
	74931	Methyl mercaptan (Methanethiol)	A
HAP	80626	Methyl methacrylate	C
	3735237	Methyl phenkapton	C
	78944	Methyl vinyl ketone (3-butene-2-one)	C
HAP	75092	Methylene chloride (Dichloromethane)	A
HAP	101688	Methylene diphenyl diisocyanate (MDI)	A
HAPs	78988	Methylglyoxal	B
	7786347	Mevinphos	A
	315184	Mexacarbate	C
HAP	1634044	MTBE (Methyl tertiary butyl ether)	C
	505602	Mustard gas (Dichlorodiethyl sulfide)	A
HAP	108383	m-Xylene	C

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
HAP	121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	A
HAP	91203	Naphthalene	B
HAP	0	Nickel compounds (incl. nickel subsulfide)	A
	54115	Nicotine	A
	7697372	Nitric acid	A
HAPs	-	Nitrilotriacetic acid, Ca-, Na-, K salts	B
HAP	98953	Nitrobenzene	A
	1122607	Nitrocyclohexane	C
HAPs	55185	N-Nitrosodiethylamine	A
HAP	62759	N-Nitrosodimethylamine	A
HAPs	924163	N-Nitroso-di-n-butylamine	A
HAP	59892	N-Nitrosomorpholine	B
HAP	684935	N-nitroso-N-methylurea	B
HAPs	615532	N-nitroso-N-methylurethane	C
	991424	Norbormide	C
HAP	90040	o-Anisidine	A
HAP	95487	o-Cresol	B
HAP	95534	o-Toluidine	A
	23135220	Oxamyl	B
	2497076	Oxydisulfoton	C
HAP	95476	o-Xylene	C
	-	Ozone depleting compounds (CFC, etc.)	C
	1910425	Paraquat	A
	2074502	Paraquat methosulfate	A
HAP	56382	Parathion	A
	298000	Parathion-methyl	A
HAP	106445	p-Cresol	A
HAP	82688	Pentachloronitrobenzene (Quintobenzene)	A
HAP	87865	Pentachlorophenol	A
	79210	Peracetic acid	C
HAP	127184	Perchloroethylene (Tetrachloroethylene)	A
HAP	108952	Phenol	C
	64006	Phenol,3-(1-methylethyl)-methylcarbamate	C
HAPs	122601	Phenyl glyceryl ether (3 phenoxy 1,2 propanediol)	A
	298022	Phorate	A
	947024	Phosfolan	C
HAP	75445	Phosgene	A
	732116	Phosmet	B

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
	13171216	Phosphamidon	C
HAP	7803512	Phosphine	A
HAP	7723140	Phosphorous	A
HAP	85449	Phthalic anhydride	B
	110894	Piperidine	C
	23505411	Pirimifos-ethyl	C
HAP	1336363	Polychlorinated biphenyls (PCBs) (Aroclors)	A
HAP	0	POLYCYCLIC ORGANIC MATTER	A
HAP	106503	p-Phenylenediamine	C
	2631370	Promecarb	C
	106967	Propargyl bromide	C
HAP	57578	Propiolactone, beta	A
HAP	123386	Propionaldehyde	C
HAP	114261	Propoxur (Baygon)	A
HAP	78875	Propylene dichloride (1,2-Dichloropropane)	A
HAP	75569	Propylene oxide	A
HAP	106423	p-Xylene	C
	140761	Pyridine, 2-methyl-5-vinyl	C
	53558251	Pyriminil	C
HAP	91225	Quinoline	A
HAP	106514	Quinone	A
HAP	0	Radionuclides (including radon)	A
	107448	Sarin	B
HAP	0	Selenium compounds	A
	62748	Sodium fluoroacetate	A
	131522	Sodium pentachlorophenate	A
	57249	Strychnine	A
	60413	Strychnine sulfate	C
HAP	100425	Styrene	C
HAP	96093	Styrene oxide	C
	3689245	Sulfotep	A
	7446119	Sulfur trioxide	C
	7664939	Sulfuric acid	B
	77816	Tabun	B
	13494809	Tellurium	A
	107493	TEPP (Tetraethyldithiopyrophosphate)	A
	13071799	Terbufos	A
	509148	Tetranitromethane	A

<b>LIST OF HAPS</b>			
CAS		Toxics	BIN
	-	Thallium compounds	A
	297972	Thionazin (o,o diethyl-0-2-pyridinylphosphorothioate)	C
	108985	Thiophenol (Phenyl mercaptan)	A
	79196	Thiosemicarbazide	C
HAP	7550450	Titanium tetrachloride	C
HAP	108883	Toluene	C
HAP	8001352	Toxaphene (Camphechlor)	A
	110576	TRANS 1,4-DICHLOROBUTENE	B
HAP	79016	Trichloroethylene (TCE)	C
HAP	121448	Triethylamine	A
HAP	1582098	Trifluralin	A
	555771	Tris(2-chloroethyl)amine	C
	2001958	Valinomycin	C
HAP	108054	Vinyl acetate	C
HAP	593602	Vinyl bromide	A
HAP	75014	Vinyl chloride	A
	81812	Warfarin	A
	129066	Warfarin sodium	A
HAP	1330207	Xylene (and mixed isomers)	C
	28347139	Xylylene dichloride	C
	1314847	Zinc phosphide	A

## COLORADO OZONE NON-ATTAINMENT OR ATTAINMENT MAINTENANCE AREAS

### I. CHRONOLOGY OF ATTAINMENT STATUS

#### Denver Metropolitan Area Only

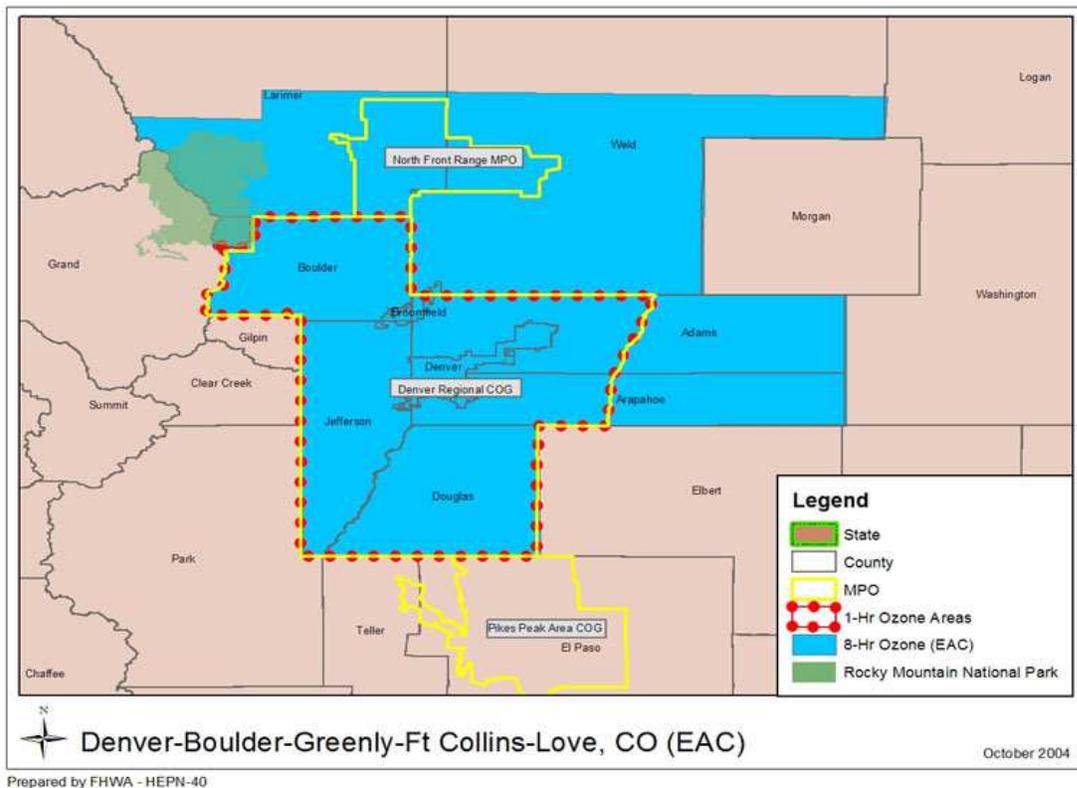
DATE 1977	DENVER 1-HOUR OZONE NON-ATTAINMENT AREA DESIGNATION FIRST BECOMES EFFECTIVE IN 7-COUNTY DENVER METROPOLITAN AREA
10/11/01	DENVER 1-HOUR OZONE ATTAINMENT MAINTENANCE AREA DESIGNATION REPLACES NON-ATTAINMENT DESIGNATION AND BECOMES EFFECTIVE IN 7-COUNTY DENVER METROPOLITAN AREA
9/2/05	1-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD IS REVOKED IN COLORADO EXCEPT FOR THE DENVER 1-HOUR OZONE ATTAINMENT MAINTENANCE AREA.

#### Denver Metropolitan Area and North Front Range

10/11/01	1-HOUR ATTAINMENT MAINTENANCE AREA REPLACES NON-ATTAINMENT DESIGNATION FOR THE DENVER METRO AREA/NORTH FRONT RANGE AREA
4/15/04	EPA DESIGNATES THE DENVER METRO AREA/NORTH FRONT RANGE REGION AS AN 8-HOUR OZONE NON-ATTAINMENT AREA, DESIGNATION DEFERRED DUE TO THE IMPLEMENTATION OF THE EARLY ACTION COMPACT
11/20/07	DENVER 8-HOUR OZONE NON-ATTAINMENT DESIGNATION BECOMES EFFECTIVE IN 9 COUNTY DENVER METROPOLITAN AREA

### II. MAPS

#### Denver Metropolitan Area and North Front Range



## Appendix E

### **OSHA PROGRAMS RECORDKEEPING REQUIREMENTS SUMMARY**

- 1. Hazardous Communication(HAZCOM)/Employee Right to Know (RTK)**
  - a. Documentation Requirements;
    - 1) Written Program
    - 2) Chemical List
    - 3) Current MSDS
    - 4) Training Program
  - b. Records
    - 1) Sign-in-sheets
    - 2) Tests, signed certificates
    - 3) Old MSDS sheets (keep for 30 years)
- 2. Personal Protective Equipment (PPE)**
  - a. Documentation Requirements;
    - 1) Written Program
    - 2) Training Program
    - 3) Written Assessments
  - b. Records;
    - 1) Written assessments
    - 2) Sign-in-sheets
    - 3) Tests, signed certifications
    - 4) Annual review of program
- 3. Lock-out/Tag-out (LO/TO)**
  - a. Documentation Requirements;
    - 1) Written Program
    - 2) Written procedures specific to machines
    - 3) Training Program per Authorized, Affected and Other employees
  - b. Records;
    - 1) Written procedures/energy hazard assessments specific to machines that require them
    - 2) Sign-in-sheets
    - 3) Tests, signed certificates
    - 4) Annual Review of written program and procedures
    - 5) Maintenance Logs indicating that LO/TO was performed **HIGHLY RECOMMENDED!**
- 4. Fire Prevention (more than 10 employees)**
  - a. Documentation Requirements;
    - 1) Written Program
    - 2) Training Program
    - 3) Evacuation Procedures
    - 4) Site Plan (if necessary)
  - b. Records;
    - 1) Sign-in-sheets
    - 2) Tests, signed certificates
    - 3) Record of annual fire extinguisher training NOTE: This can be done by Fire Department or your company's Fire Extinguisher servicing company.
    - 4) Record of evacuation training i.e. fire drills
    - 5) Monthly fire extinguisher check (i.e. checking for sign over top, accessibility, charged and mounted.)
- 5. Fire Prevention (10 or less employees)**
  - a. Documentation Requirements;
    - 1) None, however highly recommend that your company have one in order to prove 'good faith' efforts.
  - b. Records;

- 1) Record of informing employees of emergency procedures and fire prevention guidelines
  - 2) Record of annual fire extinguisher training. NOTE: This can be done by Fire Department or your company's Fire Extinguisher servicing company.
  - 3) Monthly fire extinguisher checks (e.g., checking for sign over top, accessibility, charged and mounted.)
- 6. Forklift Operator (Training done every 3 years)**
- a. Documentation Requirements;
    - 1) Written Program not required however **HIGHLY RECOMMENDED!**
    - 2) Daily Maintenance checklists
    - 3) Operator's Manual
    - 4) Data Plate on forklift
  - b. Records;
    - 1) Record of Classroom and Operational training (i.e. Driving test)
    - 2) Sign-in-sheets
    - 3) Tests, both classroom and operational training certificates
    - 4) Daily checklists (filled in, thereby proving that it is done)
- 7. Respiratory Protection**
- a. Documentation Requirements;
    - 1) Written Program
    - 2) Training Program
  - b. Records;
    - 1) Medical records of annual physical
    - 2) Training records i.e. fit-testing, maintenance procedures etc.
    - 3) Records of equipment maintenance i.e. cartridges changed periodically
- 8. Hearing Conservation (required if employees exposed to 85 dba/TWA)**
- a. Documentation Requirements;
    - 1) Written Program
  - b. Records;
    - 1) Medical Records of hearing tests including baseline reports (Annual)
    - 2) Training records of how employees should utilize hearing protection
    - 3) Dosimeter sound-level readings
- 9. Injury and Illness Prevention/Accident Prevention (not a federally required program therefore only certain states have this requirement i.e. Washington, Oregon, Nevada, California) - Recommended in Colorado**
- a. Documentation Requirements;
    - 1) Written Program including (but not limited to);
      - a) Company Safety Policy
      - b) Code of Safe Practices
      - c) Disciplinary Policies
      - d) Safety Committee guidelines
  - b. Records;
    - 1) Written hazard assessments
    - 2) Training records i.e. tests, signed certificates
    - 3) Sign-in-sheets
    - 4) Safety Committee Meeting Minutes
- 10. OSHA 300 Forms. Maintaining OSHA Forms 300, 300A, 301 (for companies with 10 or more employees)**
- a. Documentation Requirements;
    - 1) **OSHA 300 Forms** (Have at least 5 years worth on hand)
      - a) **300 Form:** Filled out completely as 'recordable-cases' occur.
      - b) **300A Form:** Filled out completely totaling a given year's recordable injuries/illnesses i.e. Year 2006 injuries to be totaled and posted by February 1, 2007 until April 30, 2007
      - c) **301 Form:** For each entry on the '300-Form' there should be a corresponding 301 form filled out. EXCEPTION: If you have already filled out an Insurance-Claim Form with the same information required on the 301 Form then you can use that form instead.
  - b. Records (maintain for 5 years).

### **OSHA Departmental Compliance Checklist**

Sometimes especially in larger facilities it may be difficult to manage your company's overall compliance. In these situations it is obviously necessary to delegate to supervisors the responsibility of employee compliance in their respective departments. However, using our four-page complete checklist may be too daunting or cumbersome to a supervisor to use. Therefore, the following checklist can be used to help your departmental supervisors or managers to audit their respective areas.

- Have my employees been trained in the following areas?
  - Right to Know (RTK)
  - Personal Protective Equipment (PPE)
  - Injury and Illness Prevention Plan (IIPP) or Accident Prevention (CA, WA, OR, NV only), recommended in Colorado
  - Lock-out/Tag-out (LO/TO)
  - Forklift training
  - Fire Prevention
  - Fire Extinguisher
  - Evacuation Training
  - Other
- Is the use of PPE enforced?
- Is proper PPE available?
- Are my employees obeying the Code of Safe Practices?
- Are my employees or contractors implementing LO/TO?
- Are my employees familiar with our evacuation procedures?
- Are my employees familiar with our spill response procedures per our emergency response plan (or the Business Plan in California)?
- Are my employees familiar with how to report any injuries or illnesses they may have?
- Are the containers in my area (especially secondary containers) properly labeled i.e. Manufacturer's Name, Common or Product Name, Appropriate Hazard Warning?
- Are the Exits in my area unblocked and accessible?
- Are the fire extinguishers in my area charged, accessible and checked monthly?
- Are my eyewashes functioning properly and tested no less than monthly?
- Are the first aid kits in my area stocked i.e. materials not expired, kit clean and sanitary?
- Are the aisles in my department at least 24" wide and not blocked?
- Are possible trip hazards in my area eliminated i.e. cords, pallets, trash etc.?
- Is my department clean i.e. free of trash, debris, chemicals on floor etc.? Also, pallets laid flat?
- Is there any unauthorized use of extension cords i.e. used on a permanent basis?
- Are ladders in my area secured? (Especially 8 foot or taller?)
- Are my employees handling flammable properly i.e. grounding, no smoking etc.?
- Are propane tanks in my area secured?
- Are all electrical panels or cut-off switches accessible i.e. at least 36" clearance in front of them?
- Are my employees lifting properly i.e. lifting with legs and not back?
- Are rag containers closed?
- In pre-press is silver-recovery unit functioning properly?
- Are any Hazardous Waste Containers in my area leaking or unlabeled?

## Appendix F

### RESOURCES

#### **Trade Associations**

Printing & Imaging Association Mountain States  
(303) 771-1578  
[www.piams.org](http://www.piams.org)

Flexographic Technical Association (FTA)  
(631) 737-6020  
[www.fta-ffta.org](http://www.fta-ffta.org)

Printing Industries of America/Graphic Arts Technical Foundation (PIA/GATF)  
(800) 910-GATF  
[www.gain.net](http://www.gain.net)

Gravure Association of America (GAA)  
(585) 436-2150  
[www.gaa.org](http://www.gaa.org)

Screenprinting & Graphic Imaging Association International (SGIA)  
(888) 385-3588  
[www.sgia.org](http://www.sgia.org)

#### **Colorado Department of Public Health and Environment Contacts**

Small Business Assistance Program (SBAP)  
(303) 692-3175 and (303) 692-3148  
[www.cdphe.state.co.us/ap/sbap/index.html](http://www.cdphe.state.co.us/ap/sbap/index.html)

Small Business Ombudsman (SBO)  
(303) 692-2135  
[www.cdphe.state.co.us/el/sbo/sbomain.html](http://www.cdphe.state.co.us/el/sbo/sbomain.html)

Generator Assistance Program (GAP)  
(303) 692-3307  
[www.cdphe.state.co.us/hm/gap/index.htm](http://www.cdphe.state.co.us/hm/gap/index.htm)

Hazardous Material and Waste Management  
Division (HMWMD)  
Technical Assistance Line  
(303) 692-3320 or toll-free (888) 569-1831  
Ext. 3320  
Division General Number: (303) 692-3300  
[www.cdphe.state.co.us/hm/index.htm](http://www.cdphe.state.co.us/hm/index.htm)

Spill Release Reporting  
Hazardous Material and Waste Management  
Division  
[www.cdphe.state.co.us/hm/spillsandreleases.htm](http://www.cdphe.state.co.us/hm/spillsandreleases.htm)

Sustainability/P2 Program  
(303) 692-2186  
[www.cdphe.state.co.us/el/index.html](http://www.cdphe.state.co.us/el/index.html)

Environmental Leadership Program  
(303) 692-3477  
[www.cdphe.state.co.us/el/elp/index.html](http://www.cdphe.state.co.us/el/elp/index.html)

Water Quality Control Division (WQCD)  
Pretreatment Program  
(303) 692-3618

Stormwater Permits Unit (WQCD)  
(303) 692-3500  
[www.cdphe.state.co.us/wq/index.html](http://www.cdphe.state.co.us/wq/index.html)

Air Pollution Control Division (APCD)  
(303) 692-3100  
[www.cdphe.state.co.us/ap/index.html](http://www.cdphe.state.co.us/ap/index.html)

## RESOURCES

### **Local Health Department Contacts**

[www.cdphe.state.co.us/wq/index.html](http://www.cdphe.state.co.us/wq/index.html)

### **Local Fire Department Contacts**

<http://dfs.state.co.us/FireDeptInfo.htm>

### **OSHA Information**

Printing & Imaging Association Mountain States  
(303) 771-1578  
[www.piams.org](http://www.piams.org)

Assured Compliance Solutions, Inc.  
(480) 829-9051 or toll-free (800) 280-5415  
[www.complianceanswers.com](http://www.complianceanswers.com)

Hellman & Associates  
(303) 384-9828  
[www.ehscompliance.com](http://www.ehscompliance.com)

OSHA Consultation Program, Colorado State University  
(970) 491-6151  
[www.bernardino.colostate.edu](http://www.bernardino.colostate.edu)  
e-mail: [ohss@lamar.colostate.edu](mailto:ohss@lamar.colostate.edu)

OSHA  
[www.osha.gov](http://www.osha.gov)

OSHA's Safety & Health Achievement Recognition Program (SHARP)  
[www.osha.gov/dcsp/smallbusiness/sharp.html](http://www.osha.gov/dcsp/smallbusiness/sharp.html)

OSHA Assistance for the Printing Industry  
[www.osha.gov/SLTC/printing\\_industry/index.html](http://www.osha.gov/SLTC/printing_industry/index.html)

## RESOURCES

### Other Useful Internet Sites for Printers

EPA/OECA, Profile of the Printing Industry

[www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/printing.html](http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/printing.html)

Printer's National Environmental Assistance Center (PNEAC)

[www.pneac.org](http://www.pneac.org)

EnviroSense, Waste Reduction for the Commercial Printing Industry

<http://es.epa.gov/techinfo/facts/fact2.html>

U.S. EPA Online Library

[www.epa.gov/natlibra/ols.htm](http://www.epa.gov/natlibra/ols.htm)

National Environmental Compliance Assistance Clearinghouse

<http://cfpub2.epa.gov/clearinghouse/index.cfm>

Business Assistance Tools

<http://es.epa.gov/cooperative/topics/printing.html>

TRI Guide for Printing and Publishing

[www.epa.gov/tri/guide\\_docs/2000/00printing.pdf](http://www.epa.gov/tri/guide_docs/2000/00printing.pdf)

Printers' Simplified Total Environmental Partnership (PrintSTEP)

[www.epa.gov/compliance/assistance/sectors/printstep.html](http://www.epa.gov/compliance/assistance/sectors/printstep.html)

Pollution Prevention and Environmental Assistance (N. Carolina)

[www.p2pays.org](http://www.p2pays.org)

EPA's Design for the Environment (DfE) Publications

[www.epa.gov/dfe/pubs](http://www.epa.gov/dfe/pubs)

Commercial Printing Compliance and Pollution Prevention Workbook (PPRC)

[www.pprc.org/pubs/pubslst.cfm](http://www.pprc.org/pubs/pubslst.cfm)

Pollution Prevention for Printers

[www.greenerprinter.com/grp/home.do](http://www.greenerprinter.com/grp/home.do)

Sustainability Programs

[www.co.boulder.co.us/sustain/](http://www.co.boulder.co.us/sustain/)

[www.ci.fort-colins.co.us/sustainability/?departments](http://www.ci.fort-colins.co.us/sustainability/?departments)

Pacific Northwest Pollution Prevention Resource Center Website

[www.pprc.org/pprc](http://www.pprc.org/pprc)

Hazardous Chemical Database

<http://ull.chemistry.uakron.edu/erd/>

Oxford MSDS Database

<http://physchem.ox.ac.uk:80/MSDS>

## NOTES

## NOTES

**The Compliance Certification Workbook  
Managing your Environmental Health and Safety Programs  
was developed by  
Printing & Imaging Association Mountain States &  
Colorado Department of Public Health & Environment  
Small Business Assistance Program  
November 2009**

