

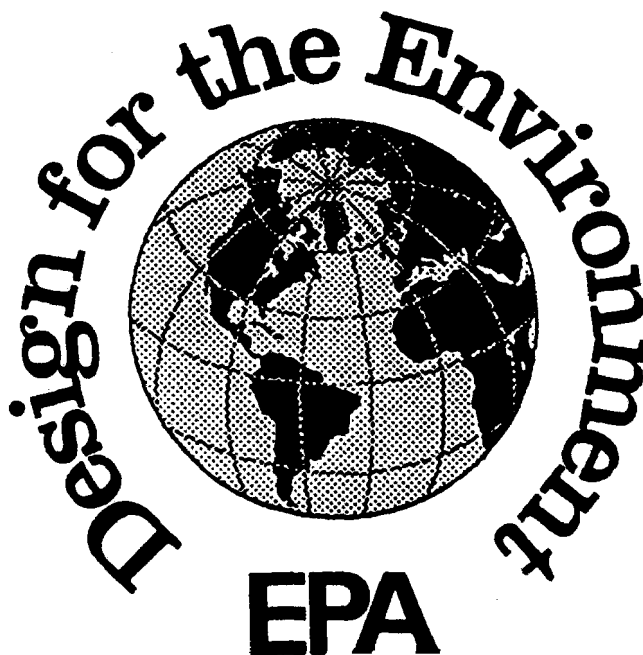


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FEDERAL ENVIRONMENTAL REGULATIONS POTENTIALLY AFFECTING THE COMMERCIAL PRINTING INDUSTRY



Design for the Environment Program
Economics, Exposure and Technology Division
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PREFACE

This discussion of environmental statutes potentially affecting the commercial printing industry is intended for information purposes only. It is not an official EPA guidance document and should therefore not be relied on by companies in the printing industry to determine applicable regulatory requirements.

The applicability of many Federal regulations is determined in part by the chemicals being used at a facility. This draft covers chemicals that the printing industry has identified as being used in the processes of lithography, flexography, gravure, screen printing and letterpress. However, individual facilities have their own chemical use patterns, which means that a particular facility may use chemicals that are not listed in this report or may use some but not all of them. As a result, each facility must identify the universe of rules that apply to it by examining the regulations themselves.

This report only discusses Federal environmental statutes. However, implementation of many Federal programs is delegated to States with programs at least as stringent as the Federal program. Thus, even where Federal regulations apply, State laws may impose additional requirements that are not addressed in this document.

This study covers the following kinds of Federal environmental requirements: Clean Air Act requirements, Clean Water Act requirements, Resource Conservation and Recovery Act (RCRA) requirements, Superfund and Emergency Planning and Community Right-to-Know requirements, and Toxic Substance Control Act requirements. The study provides an overview of regulations affecting the commercial printing industry and of the specific chemicals used in the industry that may trigger particular regulatory requirements.

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CLEAN AIR ACT REQUIREMENTS

Section A. CLEAN AIR ACT REQUIREMENTS

Law: Federal Clean Air Act (Amended 1990)

The Clean Air Act (CAA), with its 1990 amendments, sets the framework for air pollution control as it affects the printing industry. This framework has several elements. Several portions of Title I of the CAA address requirements for the attainment and maintenance of National Ambient Air Quality Standards (NAAQS). Section A.1 discusses how the implementation of Title I of the CAA may affect the printing industry.

Section 112 of the CAA covers emissions of hazardous substances. For a wide variety of such substances, Congress directed the EPA to base its limits on emissions and technologies rather than on ambient air quality per se. Section A.2 discusses how controls on hazardous air pollutants may affect the printing industry.

The 1990 amendments to the CAA provide a new mechanism for implementing both the National Ambient Air Quality Standards and the Act's hazardous substance limitations. This new mechanism is the permit, which would be required of major sources of (1) pollutants affecting ambient air quality, (2) hazardous air pollutants, and (3) new sources. Permits are discussed in Section A.3 and Appendix C of this report.

Finally, Title VI of the Clean Air Act deals with ozone-depleting chemicals. Several solvents used in the printing industry are affected by this law. Regulations affecting the printing industry are discussed in Section A.4 of this report.

A.1 EPA RESTRICTIONS ON NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS (40 CFR 50)

EPA's National Ambient Air Quality Standards (NAAQS) establish levels of air quality that are to be applied uniformly throughout regions in the United States. An air quality control region is classified as a "nonattainment" area if a NAAQS is violated anywhere in the region. (In the case of ozone, a violation occurs if the 4th highest reading over any 24-hour period in the past 3 years exceeds the NAAQS for ozone.) Two types of NAAQS are set:

- (1) Primary standards that define the level of air quality necessary to prevent any adverse impact on human health, and
- (2) Secondary standards that define the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

These standards recognize that the severity of the adverse health effects associated with exposure often depends on the duration of exposure. Accordingly, "short-term" standards set limits for a 1-hour, an 8-hour, or a 24-hour period, while "long-term" standards are established on an annual basis.

The EPA has set National Ambient Air Quality Standards for the six pollutants shown in Exhibit 1. These standards are used as a foundation for the regulatory framework discussed in this section. Of the six, the NAAQS for ozone, NO_x and particulate matter are likely to have a significant impact on the printing industry. **Printing facilities are not, of course, major sources of ozone per se; however, they are sources of emissions of volatile organic compounds (VOCs), the precursors of ozone. Thus, although there is a NAAQS for ozone, the relevant emissions for monitoring purposes are VOCs.**

**EXHIBIT 1. National Ambient Air Quality Standards for Criteria
Pollutants (As of July 1, 1991)**

Pollutant	Primary Standards (Protective of Health) ¹
Ozone	0.120 ppm (235 µg/m ³) (1-hour average)
Carbon Monoxide	9 ppm (10 mg/m ³) (8-hour average) 35 ppm (40 mg/m ³) (1-hour average)
Particulate Matter (PM-10)	150 µg/m ³ (24-hour average) 50 µg/m ³ (annual arithmetic mean)
Sulfur Dioxide	0.140 ppm (365 µg/m ³) (24-hour average) 0.03 ppm (80 µg/m ³) (annual arithmetic mean)
Nitrogen Dioxide	0.053 ppm (100 µg/m ³) (annual arithmetic mean)
Lead	1.5 µg/m ³ (arithmetic mean averaged quarterly)

¹See 40 CFR Part 50. The Clean Air Act also requires that EPA establish secondary standards, which protect against adverse effects on the environment. Secondary standards have been established for most of the listed pollutants, and, in most cases, the levels are lower than those in the primary standards.

A.1.1 Existing Sources of Emissions

A.1.1.1 Ozone non-attainment areas

The "design value" shown in column 3 of Exhibit 2 is the 4th highest reading taken over any 24-hour period in a nonattainment area. Based on this figure, a nonattainment area is classified as Marginal, Moderate, Serious, Severe, or Extreme. As shown in this exhibit, attainment deadlines are based on a sliding scale that reflects the severity of the pollution. Areas that are likely to be classified as Extreme, Severe, or Serious as of late-1990 are presented in Exhibit 3. A single ozone transport region exists for eleven states and the District of Columbia (the northeast ozone transport region).²

EXHIBIT 2. Classification of Ozone Nonattainment Areas

Classification	Deadline to Attain (from November 15, 1990)	Design Value (ppm)
Marginal	3 Years	0.121 - 0.138
Moderate	6 Years	0.138 - 0.160
Serious	9 Years	0.160 - 0.180
Severe	15 Years	0.180 - 0.190
	17 Years	0.190 - 0.280
Extreme	20 Years	Above 0.280

²The States in the northeast ozone transport region are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

A source in a nonattainment area defined as "major" must install Reasonably Available Control Technology (RACT) as prescribed in the applicable State Implementation Plan (SIP).³ A major source is defined both by the size of the source's **facility-wide** emissions and the category of the nonattainment area. These conditions are presented in Exhibit 4. In addition, if a firm has the potential to emit more than 100 tons per year (TPY) , it is also considered to be a major source. The statement "potential to emit" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitations on the capacity of the source to emit a pollutant, provided the limitation or its effect on emissions is federally-enforceable, shall be treated as part of its design.

States included in an ozone transport region must submit SIPs to the EPA with special requirements pertaining to enhanced vehicle inspection and maintenance programs and implementation of RACT with respect to all sources of volatile organic compounds in the States. In addition, **a stationary source in an ozone transport region that emits or has the potential to emit at least 50 TPY of VOCs is considered a major source** and is subject to the requirements which would be applicable to major stationary sources if the area were classified as a Moderate nonattainment area.

³EPA has defined 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. RACT for a particular source is determined on a case-by-case basis, considering the technological and economic circumstances of the individual source. EPA regulations provide that less stringent emission limitations than those achievable with RACT are acceptable only if the State plan shows that the less stringent limitations are sufficient to attain and maintain national ambient air quality standards, and show reasonable further progress during the interim before attainment. (44 Fed Reg 53, 762, Sept. 17, 1979)

EXHIBIT 3. Ozone Nonattainment Areas

Extreme (1 area)

Los Angeles-Anaheim-Riverside, CA

Severe (8 areas)

Baltimore, MD

Chicago, IL-IN-WI

Houston-Galveston-Brazoria, TX

Milwaukee-Racine, WI

Muskegon, MI

New York, NY-NJ-CT

Philadelphia, PA-NJ-DE

San Diego, CA

Serious (16 Areas)

Atlanta, GA

Bakersfield, CA

Baton Rouge, LA

Beaumont-Port Arthur, TX

Boston, MA

El Paso, TX

Fresno, CA

Hartford, CT

Huntington-Ashland, WV-KY-OH

Parkersburg-Marrieta, WV-OH

Portsmouth-Dover-Rochester, NH-ME

Providence, RI

Sacramento, CA

Sheboygan, WI

Springfield, MA

Washington, DC-MD-VA

**EXHIBIT 4. Existing Source RACT Requirements for Each Ozone
Nonattainment Category**

Category of Nonattainment Area	Size of VOC or NO _x Sources Affected (Tons/Year)
Extreme	10
Severe	25
Serious	50
Moderate and Marginal	100

A determination of the necessary RACT requirements for major sources is made on the basis of a case-by-case review of each facility. In an attempt to issue uniform guidelines, the EPA has begun to issue Control Techniques Guidelines (CTGs) for industrial categories. The EPA is developing a CTG for offset lithographic printing which will cover both web and sheet feed and newspaper offset, as well as fountain solutions, cleaning inks and the VOCs that occur in inks and heat set printing. A draft document was circulated in October 1991 for comment at a November 1991 public meeting. A revised draft is expected to be available by November 1993. The availability of this draft will be announced in the Federal Register. The final document is expected to be completed by Summer 1994. (Contact Dave Salman 919-541-0859.)

Control Techniques Guideline documents already exist for rotogravure and flexographic printing, fabric coating, and paper coating. Many of the state regulations for rotogravure and flexographic printing are based on guidance provided by EPA in the 1978 control techniques guidelines for these printing processes. These regulations often apply only to sources with

potentially uncontrolled VOC emissions greater than 100 tons per year. Many of the regulations for fabric coating and paper coating are based on guidance provided by EPA in a 1977 CTG for these processes. The fabric coating regulations cover vinyl printing and coating which include printing on such items as vinyl wallpaper and automobile upholstery. The paper coating regulations cover the application of coatings to paper, film and foil. (See Appendix A for more details on CTGs for rotogravure, flexographic, and coating operations.)

To the extent that a printing industry source is covered by any of EPA's CTGs, it may be covered by a State Implementation Plan (SIP) RACT rule even if it is not a major source. Each State is required to develop a SIP for all nonattainment areas. SIPs contain a wide range of requirements that are designed to decrease ambient ozone concentrations.

The EPA has studied the economic and technical feasibility of control options for small (less than 100 tons per year potential uncontrolled emissions) rotogravure and flexographic printing facilities. A 1992 EPA document, Alternative VOC Control Technique Options for Small Rotogravure and Flexography Facilities, PB93-1223071, can be used as a reference for identifying capture and control technologies and the costs associated with these technologies. Industry representatives caution that the costs for capture and control technologies may be severely underestimated⁴. Another EPA publication, Best Demonstrated Control Technology Guidelines for Graphic Arts, PB91-168427 compiles numerous case studies of rotogravure and flexographic facilities that have achieved VOC control efficiencies of 90% or better.⁵

A.1.2 New Sources of Emissions

New major stationary sources of air pollution and major modifications to major stationary sources are required by the Clean Air Act to obtain an air pollution permit before commencing

⁴Industry representatives at the Technical Meeting of the Environmental Conservation Board of the Graphics Communications Industry, September 22, 1993.

⁵These documents are available to the public through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847).

construction. The process is called **new source review** (NSR) and is required whether the major source or modification is planned for an area where the NAAQS are exceeded (nonattainment areas) or an area where air quality is acceptable (attainment and unclassifiable areas). Permits for sources in attainment areas are referred to as **prevention of significant air quality deterioration** (PSD) requirements and include the following:

- Installation of Best Available Control Technology (BACT)⁶;
- A detailed air quality analysis showing that there will be no violation of PSD "increments;"
- Prediction of future air quality standards; and
- Possible monitoring of air quality for one year prior to the issuance of the permit.
- Demonstration of standard attainment through the undertaking of an air quality analysis.

Restrictions in nonattainment areas are more severe. The principal requirements of NSR in nonattainment areas are:

- Installation of Lowest Achievable Emission Rate (LAER)⁷ technology;
- Provision for "offsets" (see Exhibit 5) representing emission reductions that must be made from other sources; and

⁶EPA determines BACT requirements by: (1) identifying all control technologies; (2) eliminating technically infeasible options; (3) ranking remaining control options by control effectiveness; (4) evaluating the most effective controls and documenting results; and (5) selecting BACT. See *Draft New Source Review Workshop Manual*, U.S. EPA, Office of Air Quality Planning and Standards, October 1990.

⁷LAER is the most stringent emission limitation derived from either of the following: (1) the most stringent emission limitation contained in the implementation plan of any State for such class or category of source; or (2) the most stringent emission limitation achieved in practice by such class or category of source. See CAA 171 (3).

**EXHIBIT 5. Major Source Definitions and Offset Ratios in Ozone
Nonattainment Areas**

Category	Size of Major Source ⁸ (Tons/Year of VOCs)	Offset Ratios ⁹
Marginal	100	1.1:1
Moderate	100	1.15:1
Serious	50	1.2:1
Severe	25	1.3:1
Extreme	10	1.5:1

**A.2 HAZARDOUS AIR POLLUTANTS AND MAXIMUM ACHIEVABLE
CONTROL TECHNOLOGY (MACT) STANDARDS**

The National Ambient Air Quality Standards apply only to a small number of the most common pollutants. Additional requirements that directly restrict the emission of 189 hazardous air pollutants are established in Part 112 of the Clean Air Act. The EPA is authorized to establish Maximum Achievable Control Technology (MACT) standards for source categories that emit at least one of the pollutants on the list. Chemicals listed in Part 112 of the Clean Air Act

⁸States have the option of choosing a major source definition of 5 tons per year (TPY) (and accepting other conditions) to avoid complying with the requirement that emissions be reduced by 15 percent over the first 6 years. See Section 182(b)(1)(A)(ii).

⁹Emissions offsets are generally obtained from existing sources located in the vicinity of a proposed source and must (1) offset the emissions increase from the new source or modification and (2) provide a net air quality benefit. The amount of net air quality benefit depends on the category of the nonattainment area and is listed in Exhibit 5. In general emission reductions which have resulted from some other regulatory action are not available as offsets.

that are used in the printing industry are shown in Exhibit 6. MACT standards for the flexography, publication gravure and rotogravure sections of the commercial printing industry are currently scheduled for proposal in 1993, and final in 1994.

**EXHIBIT 6. Chemicals Used in the Printing Industry That are Listed as
Hazardous Air Pollutants in the Clean Air Act Amendments**

HAZARDOUS AIR POLLUTANT	
Benzene	Lead compounds
Cadium compounds	Methanol
Carbon tetrachloride	Methyl ethyl ketone
Chromium compounds	Methyl isobutyl ketone
Cobalt compounds	Methylene chloride
Cumene	Perchloroethylene
Dibutylphthalate	Polycyclic organic matter
Diethanolamine	Propylene oxide
Ethyl benzene	Toluene
Ethylene glycol	2,4-Toluene diisocyanate
Formaldehyde	1,1,2-Trichloroethane
Glycol ethers	Trichloroethylene
Hexane	Vinyl chloride
Hydrochloric acid	Xylenes
Isophorone	

A source will receive a 6-year extension in the compliance date for a MACT standard if it achieves a 90-percent reduction in its HAP emissions (or 95 percent for particulate emissions) prior to the date on which the MACT standard is proposed for its industry category. There is no requirement to notify EPA before issuance of the standard; however, the demonstration of emissions reduction must be made before the standard is proposed. A source should submit its demonstration either along with its Title V permit application or as a permit modification. EPA is issuing guidance that will specify how the demonstration must be made.

A.3 PERMITS (40 CFR 70)

The CAA Title V (promulgated at 40 CFR 70) defines the minimum standards and procedures required for State operating permit programs. The permit system is a new approach established by the Amendments that is designed to define each source's requirements and to facilitate enforcement. In addition, permit fees will generate revenue to fund implementation of the program.

Any facility defined as a "major source" is required to secure a permit. Part 70.2 defines a source as a single point from which emissions are released or as an entire industrial facility that is under the control of the same person(s), and a major source is defined as any source that emits or has the potential to emit:

- 10 TPY or more of any hazardous air pollutant;
- 25 TPY or more of any combination of hazardous air pollutants; or
- 100 TPY of any air pollutant.

For **ozone nonattainment areas**, major sources are defined as sources with the potential to emit:

- 100 TPY or more of volatile organic compounds (VOCs) in areas defined as marginal or moderate;
- 50 TPY or more of VOCs in areas classified as serious;
- 25 TPY or more of VOCs in areas classified as severe; and
- 10 TPY or more of VOCs in areas classified as extreme.

In addition to major sources, all sources that are required to undergo New Source Review, are subject to New Source Performance Standards, or are identified by Federal or State regulations, **must** obtain a permit. The permit requirement for all other sources has been deferred five years.

By November 15, 1993, each State must submit a design for an operating permit program to the EPA for approval. The EPA must either approve or disapprove the State's program within one year after submission. Once approved, the State program goes into effect.

Major sources, as well as the other sources identified above, must then develop and submit their permit applications to the State within one year (this will take place near the end of 1995). Once a source submits an application, it may continue to operate until the permit is issued. This may take years because permit processing allows time for terms and conditions to be presented to and reviewed by the public and neighboring States, as well as by the EPA. When issued, the permit will include all air requirements applicable to the facility. Among these are compliance schedules, emissions monitoring, emergency provisions, self-reporting responsibilities, and emissions limitations. Five years is the maximum permit term.

However, for small businesses, such as printers, who are required to obtain a permit, many States will issue a **general permit**. A general permit is a single permitting document which can cover a category or class of many similar sources. Public notice and an opportunity for a public hearing must be provided by the permitting authority when considering issuance of a general permit, but not when the individual sources subsequently submit requests for coverage and are evaluated for a permit reflecting the terms of the general permit. Thus, printers that are eligible for coverage under a general permit need only submit a single notification form, rather than a detailed application. In addition, such printers will not have to undergo the time-consuming public notice process associated with issuing a permit. Permit conditions will be generally applicable to the source category and not tailored to the individual printing facility.

As established in Title V (40 CFR 70), the States are required to develop fee schedules to ensure the collection and retention of revenues sufficient to cover permit program costs. CAA sets a presumptive fee of \$25 per ton for all regulated pollutants (except carbon monoxide), but States can set higher or lower fees so long as they collect sufficient revenues to cover program costs.

If a printing facility is not classified as a major source, the printer should still check with the appropriate air authorities to determine if their facility requires air permits. Potential air permit requirements include:

- Federal/State/Local permits required to construct/operate new presses, coaters,

control devices, boilers, cyclones, evaporators, distillation units, and some proofing and bindery equipment.

- Federal/State/Local permits required to operate existing presses, coaters, control devices, boilers, cyclones, evaporators, distillation units, and some proofing and bindery equipment.
- Federal/State/Local permits required to modify existing equipment or changing materials (e.g., inks, fountain solutions, coatings, cleaning solvents, and other chemistries).

A.4 STRATOSPHERIC OZONE PROTECTION (40 CFR 82)

The CAA Amendments provide for a phase-out of the production and consumption of chlorofluorocarbons (CFCs) and other chemicals that are causing the destruction of the stratospheric ozone layer. Requirements apply to any individual, corporate, or government entity that produces, transforms, imports, or exports these controlled substances.

Section 602 of the Clean Air Act identifies ozone-depleting substances and divides them into two classes. Class I substances are divided into five groups; the chemicals that are used by the commercial printing industry are shown in Exhibit 7. Section 604 of the Clean Air Act calls for a complete phase-out of Class I substances by January 1, 2000 (January 1, 2002 for methyl chloroform). Class II chemicals, which are hydrochlorofluorocarbons (HCFCs), are generally seen as interim substitutes for Class I CFCs.

EXHIBIT 7. Class I Substances

<u>Group IV</u>	<u>Group V</u>
Carbon tetrachloride	Methyl chloroform

Class II substances consist of 33 HCFCs. The law calls for a complete phase-out of Class II substances by January 1, 2030. The schedule for the HCFC phase-out has not yet been

finalized; however, EPA has proposed to begin phase-out of some HCFCs by 2002, with a complete phase-out of all HCFCs to take place by 2030. This same proposal would phase-out CFCs, carbon tetrachloride, hydrobromofluorocarbons, and methyl chloroform by January 1, 1996. Halons used as fire extinguishers would be phased-out by January 1, 1994.

On February 11, 1993, EPA issued a rule under Section 611 of the Clean Air Act that, effective May 15, 1993, requires both domestically produced and imported goods containing or manufactured with Class I chemicals to carry a warning label. The rule covers items whose manufacture involves the use of Class I chemicals, even if the final product does not contain such chemicals.

Exports are exempt from this rule's labeling requirements, as are products that do not have direct contact with these chemicals. In addition, if direct contact occurs but is non-routine and intermittent (e.g., spot-cleaning of textiles), no labeling is required. Moreover, if a second manufacturer incorporates a product made with an ozone-depleting chemical into another item, the final product need not carry a label.

WATER REQUIREMENTS

Section B. CLEAN WATER ACT REQUIREMENTS

Law: Federal Water Pollution Control Act (Clean Water Act)

The Clean Water Act (CWA) is the basic Federal law governing water pollution control in the United States today. The commercial printing industry produces a number of pollutants that are potentially regulated under the CWA. Applicable provisions of the CWA are described below, including Spills of Oil and Hazardous Substances and the discharge of water into waters of the United States, publicly owned treatment works (POTWs), storm water discharges and storm sewers. The Underground Injection Control Program, which may impact the printing industry in the future, is discussed in Appendix B. Permit program regulations that apply across all industries and specifically to the printing industry are detailed in Sections B.2, B.3, and B.4, and Appendix C.

B.1 SPILLS OF OIL AND HAZARDOUS SUBSTANCES

B.1.1 Discharge of Oil (40 CFR 110)

The regulations in this part apply to the discharge of oil, which is prohibited by Section 311(b)(3) of the CWA. Prohibited discharges include certain discharges into or upon the navigable waters of the United States or adjoining shorelines or into or upon the waters of the contiguous zone, those occurring in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or those that may affect natural resources belonging to, appertaining to, or under the exclusive management of the United States.

These regulations define the term "discharge" used in Section 110.11 of the CWA as including (but not limited to) any spilling, leaking, pumping, pouring, emitting, emptying, or dumping into the marine environment of quantities of oil that:

- (1) Violate applicable water quality standards, or
- (2) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon the adjoining shorelines.

B.1.2 Designation and Reportable Quantities of Hazardous Substances Under the Federal Water Pollution Control Act (40 CFR 116 and 40 CFR 117)

Part 116 of the Federal Water Pollution Control Act (FWPCA) designates hazardous substances under Section 311(b)(2)(a) of the Clean Water Act, and Part 117 of the FWPCA establishes the Reportable Quantity (RQ) for each substance listed in Part 116. When an amount equal to or in excess of the RQ is discharged, the facility must provide notice to the Federal government of the discharge, following Department of Transportation requirements set forth in 33 CFR 153.203. This requirement does not apply to facilities that discharge the substance under an NPDES Permit or a Part 404 Wetlands (dredge and fill) Permit, or to a Publicly Owned Treatment Works (POTW), as long as any applicable effluent limitations or pretreatment standards have been met. RQs are listed in 40 CFR 117.3 (see Appendix B), some of which are used in the printing industry (e.g. toluene, xylene)

B.2 EPA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM (40 CFR 122)

Sections 301, 304, 306, 307 and 402 of the Clean Water Act authorize the establishment of regulations and the issuance of permits to control the discharge of pollutants to waters of the United States. The National Pollutant Discharge Elimination System (NPDES) permit program includes regulations governing these discharges. Thirty-nine States and one territory are authorized to administer NPDES programs that are at least as stringent as the federal program; the EPA administers the program in States that are not authorized to do so. The following discussion covers federal NPDES requirements; where a State implements the program, the facility may be required to comply with additional requirements not covered in this document.

The NPDES program requires permits for the discharge of "pollutants" from any "point source" into "navigable waters". The Clean Water Act defines all of these terms broadly. The term "pollutant" encompasses almost anything that a source might discharge, including dredge spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock,

sand, cellar dirt, and industrial, municipal and agricultural wastes discharged into water. The term "point source" means any discernible, confined and discrete conveyance, such as a ditch or a pipe. The Act defines "navigable waters" as "waters of the United States". Courts have construed the term "waters of the United States" very broadly; the waters need not be navigable in fact, and can include wetlands.

Thus, a source will be required to obtain an NPDES permit if it discharges almost anything directly to surface waters. A source that sends its wastewater to a publicly owned treatment works (POTW) will not be required to obtain an NPDES permit, but may be required to obtain an industrial user permit from the POTW to cover its discharge. Even if the source does not produce any wastewater, it may still be subject to the NPDES permit program if it discharges storm water associated with industrial activity, including construction activity that results in the disturbance of five or more acres of land area. Section B.4 of this document discusses when facilities need to obtain a storm water permit.

For a detailed discussion of NPDES regulations and possible application in the printing industry, see Appendix C.

B.3 INDIRECT DISCHARGER REQUIREMENTS

B.3.1 Categorical Pretreatment Standards for the Printing Industry

As mentioned above, only those facilities that discharge pollutants directly into United States waters need to obtain an NPDES permit. Facilities that discharge to a publicly owned treatment works (POTW), however, must comply with pretreatment requirements. These facilities may also be required to obtain industrial user permits from the POTW. Pretreatment requirements were developed because of concern that such waste containing toxic, hazardous, or concentrated conventional industry wastes might "pass through" POTWs or interfere with the proper and continuing operation of the POTW. In the commercial printing industry, no categorical pretreatment standards are applicable.

B.3.2 General EPA Pretreatment Standards (40 CFR 403)

General pretreatment standards apply to all facilities discharging to a POTW. Contact the appropriate POTW for permission to discharge process wastewater effluent and for permitting requirements. The general pretreatment standards prohibit the following from being introduced into a POTW:

- (1) Pollutants that create a fire hazard in the POTW including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using specified test methods;
- (2) Pollutants that will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such discharges;
- (3) Solid or viscous pollutants in amounts that will cause obstruction to the flow in the POTW, resulting in interference;
- (4) Any pollutant, including oxygen demanding pollutants (Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), etc.), released in a discharge at a flow rate and/or pollutant concentration that will cause interference with the POTW;
- (5) Heated effluents in amounts that will inhibit biological activity in the POTW, resulting in interference, but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 degrees Centigrade, unless the approval authority, upon request of the POTW, approves alternate temperature limits;
- (6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil in amounts that will cause interference or pass through;
- (7) Pollutants that result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and
- (8) Any trucked or hauled pollutants, except at discharge points designated by the POTW (40 CFR 403.5).

When a POTW uses physical, chemical, or biological means to reduce the amount of a pollutant during treatment, industrial users may be granted removal credits to reflect the level of

treatment achieved by the POTW. Removal credits enable the user to revise his/her discharge limits, which may, in turn, help to ensure that indirect dischargers do not expend resources unnecessarily to treat their own effluents to levels below the removal level achievable by the POTW.

A single discharger may find it advantageous to combine wastestreams prior to treatment, which often results in more cost-effective treatment. In Section 403.6(e), EPA provides a "combined wastestream formula" that incorporates flow, mass, and concentration to establish effluent limits.

A discharger to a POTW should be aware of the following requirements:

Recording, monitoring and reporting for discharge of wastewater to POTW (40 CFR 403.12 (o))

A business that discharges wastewater to a POTW must keep records, monitor discharges, and prepare and submit periodic monitoring reports, as determined by the POTW.

Notice of POTW of discharge of wastewater that causes problems (40 CFR 403.12(f))

A business that discharges wastewater to a POTW must immediately notify the POTW of all discharges that could "cause problems" to the POTW.

Notice to POTW of changed discharge of wastewater (40 CFR 403.12 (j))

A business that discharges wastewater to a POTW must give prompt notice of the POTW if there is a significant change in the discharge.

Notice to POTW of upset (40 CFR 403.16)

A business that discharges wastewater to a POTW must notify the POTW orally within 24 hours and in writing within 5 days of becoming aware of an exceptional incident in which there is an unintentional and temporary noncompliant discharge because of factors beyond the reasonable control of the business.

Notice to POTW of bypass (40 CFR 403.17)

A business that discharges wastewater to a POTW must notify the POTW (1) ten days in advance of the known need for an intentional diversion of wastewater streams, if possible, or (2) orally within 24 hours and in writing within 5 days of becoming aware of a bypass.

Notice to POTW of discharge of hazardous waste (40 CFR 403.12 (p))

A business that discharges to a POTW a substance which, if otherwise disposed of, would be a hazardous waste must give a one-time notice to the local sanitary district, EPA, and the appropriate State agency unless exempted. Discharges of more than 33 pounds/month of hazardous waste or any acute wastes mixed with domestic sewage require written notification to local EPA office, State waste agency, and POTW.

Notice to POTW of violation (40 CFR 403.12 (g)(2))

A business that discharges wastewater to a POTW must notify the POTW within 24 hours of becoming aware that it is in violation of a legal requirement. In addition, "significant industrial users," those who discharge more than 25,000 gallons per day, must submit to the POTW a semiannual description of the nature, concentration and flow of pollutants (the POTW will determine the pollutants for which reporting is required).

B.4 STORM WATER PERMITS (40 CFR 122.26)

Storm water permits are required for areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or

industrial machinery are exposed to storm water which drains to a municipal separate storm sewer system or directly to a receiving water. A storm water permit is not required for storm water discharges to combined municipal sewer systems (such as for those systems that carry both storm water and sewage to a POTW for treatment prior to discharge), but notification to the POTW is required. Storm water permit applications must include a site map showing the topography of the facility, including: drainage and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within each drainage area; areas used for outdoor storage or disposal; each existing structural control measure to reduce pollutants in storm water runoff; materials loading and access areas; areas where pesticides, herbicides, soil conditioners, and fertilizers are applied; each of the facility's hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and springs and other surface water bodies that receive storm water discharges. An estimation of the area of impervious surfaces, the total area drained by each outfall, and a description of the storage, handling, and disposal of "significant" materials in the three years prior to the submittal of the application must also be documented.

A certification that all outfalls have been tested or evaluated for the presence of non-storm water discharges that are not covered by a NPDES permit must be made, and this certification must include a description of the method used, dates, and the observed on-site drainage points.

Quantitative data based on samples collected during storm events from all outfalls for the following must be documented:

- (1) Any pollutant limited in an effluent guideline to which the facility is subject;
- (2) Any pollutant listed in the facility's NPDES permit;
- (3) Oil, grease, pH, BOD₅, COD, Total Suspended Solids (TSS), total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite nitrogen;
- (4) Certain pollutants known to be in the discharge;¹⁰

¹⁰See discussion of effluent characteristics at Appendix C-1 and Table C.2.

- (5) Flow measurements or estimates of the flow rate, and the total amount of discharge for the storm event(s) sampled and the method of the measurement; and
- (6) The date and duration of the storm event(s) sampled and rainfall measurements and the duration between the storm event sampled and the end of the previous measurable storm event.

EPA's **general permits** cover the majority of storm water discharges associated with industrial activity. Storm water discharges associated with industrial activity that cannot be authorized by EPA's general permits include those:

- With an existing effluent limitations guideline for storm water;
- That are mixed with non-storm water, unless the non-storm water discharges are in compliance with a different NPDES permit;
- With an existing NPDES individual or general permit for the storm water discharges;
- That are or may reasonably be expected to be contributing to a violation of a water quality standard;
- That are likely to adversely affect a listed or proposed to be listed endangered or threatened species or its critical habitat;
- From inactive mining, or inactive oil and gas operations or inactive landfills occurring on Federal lands where an operator cannot be identified (industrial permit only).

A facility must submit a Notice of Intent (NOI) to the EPA to be authorized by the general permit. A NOI does not require the collection of discharge sampling data. Facilities which discharge to a large or medium municipal separate storm sewer system must also submit signed copies of the NOI to the operator of the municipal system. Operators of all facilities covered by EPA's general permits must prepare and implement a storm water pollution prevention plan. Questions can be directed to the Storm Water Hotline at (703) 821-4823.

In September 1992, EPA issued general permits for construction and industrial activities which were intended to initially cover the majority of storm water discharges associated with industrial activity in 12 States and 6 territories without authorized NPDES programs. As of

March 1993, 35 of the 39 authorized NPDES States have the authority to issue general permits. Facilities in authorized NPDES States should contact their State permitting agencies to determine the status of the general permitting program.

RCRA-RELATED REQUIREMENTS

Section C. RCRA-RELATED REQUIREMENTS
(Hazardous and Solid Waste Management)

Law: Resource Conservation and Recovery Act of 1976 (Amended in 1984)

The Resource Conservation and Recovery Act (RCRA) of 1976 (as amended in 1984) may have a direct regulatory impact on the printing industry in three ways. First, RCRA sets up a cradle-to-grave system for tracking and regulating hazardous wastes; this system affects all segments of the printing industry. Second, Subtitle I of RCRA sets up a system for regulating underground storage tanks containing petroleum or other hazardous substances; a facility in the printing industry would be affected by regulations issued under Subtitle I only if it owns an underground storage tank containing petroleum or hazardous substances. Third, Subtitle D of RCRA sets up a framework for regulating solid wastes that are not classified as hazardous wastes. In general, the impacts of Subtitle D on the industry are indirect, i.e., come into play as a result of the industry's use of Federal or State regulations for solid waste disposal facilities, including municipal solid waste landfills. Subtitle I and Subtitle D requirements are not discussed further in this report because they will not directly impact most printing industry facilities.

The EPA has issued regulations, found in 40 CFR Parts 260-299, which implement the Federal statute. These regulations are Federal requirements. **Many States have been authorized to implement the RCRA program and may include more stringent requirements in their authorized RCRA programs. In addition, non-RCRA-authorized States may have State laws that set out hazardous waste management requirements. A facility should always check with the State when analyzing which requirements apply to their activities.**

The Federal regulations are summarized in the 1990 edition of the RCRA Orientation Manual (#055-000-00364-5), copies of which are available from the Superintendent of Documents at the Government Printing Office (202-512-0000) for \$16.00. The federal regulations are updated annually and additional provisions to RCRA may have been added or amended since the printing of the 1990 RCRA Orientation Manual. For up-to-date information, the current regulations should

be consulted. Since the EPA anticipates that most printing facilities which generate hazardous waste will not be subject to the permitting requirements for treatment, storage or disposal facilities and full RCRA regulation, the EPA has set forth in this survey a summary only of key RCRA provisions that are likely to affect waste generators. It is anticipated that very few (if any) facilities in the industry will be regulated as treatment, storage, or disposal (TSD) facilities. Owners and operators of TSD facilities are urged to review the RCRA regulations at Parts 264-267 of Title 40.

C.1 HAZARDOUS WASTE CLASSIFICATION

Assuming the material is a solid waste, the first evaluation to be made is whether it is also considered a hazardous waste. Part 261 of 40 CFR addresses the identification and listing of hazardous waste. The waste generator has the responsibility for determining whether a waste is hazardous, and what classification, if any, may apply to the waste. The generator must examine the regulations and undertake any tests necessary to determine if the wastes generated are hazardous. Waste generators may also use their own knowledge and familiarity with the waste to determine whether it is hazardous. Appendix I of 40 CFR Part 260 contains a valuable flow chart for determining what RCRA regulations may apply in given situations. Generators may be subject to enforcement penalties for improperly determining that a waste is not hazardous.

Wastes can be classified as hazardous either because they are listed by EPA through regulation and appear in the 40 CFR Part 261 or because they exhibit certain characteristics. Listed wastes are specifically named, e.g., discarded commercial toluene, spent non-halogenated solvents. Characteristic wastes are defined as hazardous if they "fail" a characteristic test, such as the RCRA test for ignitability.

C.1.1. Listed Wastes

There are four separate lists of hazardous wastes in 40 CFR 261. The listing is often defined by industrial processes, but all wastes are listed because they contain particular chemical

constituents (these constituents are listed in Appendix VII to Part 261). Section 261.31 lists wastes from non-specific sources and includes wastes generated by industrial processes that may occur in several different industries; the codes for such wastes always begin with the letter "F." F001, F002, F003, F004, and F005 which designate various types of spent solvent wastes, are examples of wastes from non-specific sources that may be generated by facilities in the printing industry. The second category of listed wastes (40 CFR 261.32) includes hazardous wastes from specific sources; these wastes have codes that begin with the letter "K." The remaining lists (40 CFR 261.33) cover commercial chemical products that have been or are intended to be discarded; waste codes beginning with "P" are considered acutely hazardous, while those beginning with "U" are simply considered hazardous. Exhibits 8 and 9 show listed wastes that are commonly used in the printing industry. While these exhibits are intended to be as comprehensive as possible, individual facilities may generate other hazardous wastes and may wish to consult the lists at 40 CFR 261.31-261.33.

In addition, most wastes that are (1) derived from a listed hazardous waste, or (2) are a mixture of a listed hazardous and non-hazardous waste are considered hazardous wastes. Environmental media (such as soil or ground water) that contain a hazardous waste may also be considered hazardous. EPA is currently investigating a number of solvent wastes and may propose to list some or all as hazardous wastes. Exhibit 10 summarizes those solvents and gives projected rulemaking deadlines. Of these solvents, only cumene and isophorone are common in the printing industry.

EXHIBIT 8. Examples of Listed Wastes (F) Found in the Printing Industry

Waste Code	Name or Description of Waste
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent 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, methylene chloride, trichloroethylene, 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 ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	The following spent non-halogenated 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 ten percent or more (by volume) of one or more of 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 ten percent 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.

EXHIBIT 9. Examples of Listed Wastes (U) Found in the Printing Industry

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

Exhibit 10 Solvents under EPA Investigation for Listing as Hazardous Wastes

Solvents III (Proposal by April 1994, Final by June 1995)

Cumene, phenol, isophorone, acetonitrile, furfural, epichlorohydrin, methyl chloride, ethylene dibromide, benzyl chloride, p-dichlorobenzene

Solvents II (Proposal by September 1997, final by September 1998)

2-methoxyethanol, 2-methoxyethanol acetate, 2-ethoxyethanol acetate, cyclohexanol

Solvent Study (Due September 1996)

Diethylamine, aniline, ethylene oxide, allyl chloride, 1,4-dioxane, 1,1-dichloroethylene bromoform

C.1.2 Characteristic Wastes

EPA also considers a waste hazardous if it exhibits one or more of four characteristics. The first three characteristics are determined by the physical properties of the waste; these characteristics (and the section of the CFR defining the tests and applicable waste codes) are:

- Ignitability (40 CFR 261.21, D001)¹¹;
- Corrosivity (40 CFR 261.22, D002)¹²; and

¹¹If a solid waste is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume, and has flash point less than 60°C, (140°F), as determined by a Penskey-Martens Closed Cup Tester (ASTM Standard D-93-79 or D-93-80), or a Setaflash Closed Cup Tester (ASTM Standard D-3278-78) or another EPA approved test, it exhibits the characteristic of ignitability. For non-liquids, ignitable compressed gases and oxidizers, reference §261.22.

¹²A solid waste exhibits the characteristic of corrosivity if it is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using either an EPA test method (Method 5.2 in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods") or an EPA approved test method. If a solid waste is a liquid and corrodes steel at a rate greater than 6.35 mm (0.250") per year when tested at 55°C as determined by the test method specified in the National Association of Corrosion Engineers (Standard TM-01-69) or by an approved EPA test method, than it is considered corrosive.

- Reactivity (40 CFR 261.23, D003)¹³.

Several waste streams in the printing industry may be characterized as hazardous because they exhibit one of these characteristics.

The fourth characteristic is toxicity. The toxicity characteristic applies to a list of 40 substances, including metals, non-metals, pesticides, and other organic chemicals. If a waste leachate (derived from putting the waste through a test called the Toxicity Characteristic Leaching Procedure, or TCLP) contains any one of these 40 constituents at levels above the level of regulatory concern, the waste is considered a hazardous waste. Exhibit 11 lists some of the toxicity characteristic substances that are likely to be constituents of printing industry wastes. Individual facilities may generate wastes containing other constituents that exhibit the toxicity characteristic.

EXHIBIT 11. EPA Toxic Characteristic Contaminants That May be Found in Printing Industry Waste

Waste Code	Contaminant
D005	Barium
D007	Chromium
D019	Carbon tetrachloride
D035	Methyl ethyl ketone
D011	Silver
D040	Trichloroethylene
D043	Vinyl chloride

¹³A solid waste is considered reactive if it exhibits any of the following properties: (1) is normally unstable and readily undergoes violent change without detonating; (2) reacts violently or forms potentially explosive mixtures with water; (3) when mixed with water, generates toxic gases, vapors or fumes in a quantity that can present a danger to human health or the environment (for a cyanide or sulfide bearing waste, this includes when exposed to pH between 2 and 12.5); (4) is capable of detonation or explosive reaction if subjected to a strong initiated source or if heated under confinement; or (5) is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

C.2 GENERATOR STATUS

The hazardous waste generator is defined as any person, by site, who creates a hazardous waste or makes a waste subject to RCRA Subtitle C. Generators are divided into three categories:

- Large Quantity Generators -These facilities generate at least 1000 kg (approximately 2200 lbs.) of hazardous waste per month, or greater than 1 kg (2.2 lbs) of acutely hazardous waste¹⁴ per month.
- Small Quantity Generators (SQG) — These facilities generate greater than 100 kg (approx. 220 lbs.) but less than 1000 kg of hazardous waste per month, and up to 1 kg (2.2 lbs) per month of acutely hazardous waste.
- Conditionally exempt small quantity generators (CESQG) — These facilities generate no more than 100 kg (approx. 220 lbs) per month of hazardous waste and up to 1 kg (2.2 lbs) per month of acutely hazardous waste.

Large and small quantity generators must meet many similar requirements. 40 CFR 262 provides that SQGs may accumulate up to 6000 kg of hazardous waste on-site at any one time for up to 180 days without being regulated as a treatment, storage, or disposal (TSD) facility and thereby having to apply for a TSD permit. The provisions of 40 CFR 262.34 (f) allow SQGs to store waste on-site for 270 days without having to apply for TSD status provided the waste must be transported over 200 miles. Large quantity generators have only a 90-day window to ship wastes off-site without needing a RCRA TSD permit. **Keep in mind that most provisions of**

¹⁴The provisions regarding acutely hazardous waste are not likely to affect printers. Acutely hazardous waste includes certain "F" listed wastes that do not apply to printers, and "P" listed wastes, none of which were identified as in use in the commercial printing industry. (See 40 CFR 261.31-33 for more information).

40 CFR 264 and 265 (for hazardous waste treatment, storage and disposal facilities) do not apply to generators who send their wastes off-site within the 90- or 180-day window, whichever is applicable.

Hazardous waste generators that do not meet the conditions for conditionally exempt small quantity generators must (among other requirements such as record keeping and reporting):

- Obtain a generator identification number;
- Store and ship hazardous waste in suitable containers or tanks (for storage only);
- Manifest the waste properly;
- Maintain copies of the manifest, a shipment log covering all hazardous waste shipments, and test records;
- Comply with applicable land disposal restriction requirements; and
- Report releases or threats of releases of hazardous waste.

The latter five requirements are discussed further below.

C.2.1 Requirements That Apply to All Generators But Vary In Accordance With the Volume of Waste Generated

C.2.1.1. Waste Containers

All generators must ensure that hazardous wastes to be shipped off site are kept in areas that meet basic safety requirements. The wastes must be properly stored in containers in good condition to prevent leaks and must be labeled as hazardous waste.

- (1) 40 CFR Part 262.34 requires that containers maintained on site be labeled with the words "HAZARDOUS WASTE."
- (2) 40 CFR Parts 262.31 and 262.32 require that containers be labeled with the name of the waste and that labels and placards be used in accordance with applicable EPA (40 CFR 262.32 and 262.33) and Department of Transportation (49 CFR Part 172 Subpart F) requirements.

- (3) 40 CFR Part 262.34 requires that the date on which accumulation begins be shown on the container.
- (4) 40 CFR 265 Subpart I requires that, except when adding or removing waste, hazardous waste must be stored in a closed container that is in good condition, be inspected at least weekly (40 CFR 265.174), and be compatible with the waste to be stored. This subpart also explains special requirements for ignitable (40 CFR 265.176) and incompatible wastes (40 CFR 265.177).

Wastes stored in tanks or tank systems and waste generators that use drip pads are subject to more extensive requirements (see 40 CFR 265 Subparts J and W, respectively).

A generator may accumulate up to 55 gallons of hazardous waste in containers at or near any point of generation where wastes initially accumulate without triggering the more onerous permit requirements for treatment, storage and disposal facilities (40 CFR 262.34(c)). The storage site must be under the control of the operator and containers must be marked hazardous waste. In addition, the containers must be in good condition, must be made of or lined with materials that will not react with, and are otherwise compatible with, the hazardous waste being stored, and must always be closed, except when adding or removing waste.

Owners and operators of facilities that use tank systems for storing hazardous waste must meet numerous requirements outlined in 40 CFR 265 Part J. These requirements include an assessment of an existing tank system's integrity in which the owner or operator must determine that the tank system is not leaking or is unfit for use. To prevent the release of hazardous wastes or constituents to the environment, secondary containment meeting the requirements of 40 CFR 265.193 must be provided. Inspections of the entire tank system must occur each operating day. Owners or operators of new tank systems or components must ensure that the foundation, structural supports, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be stored, and corrosion protection so that it will not collapse, rupture, or fail. Special requirements exist for generators of between 100 and 1000 kg (220-2200 lbs)/month that accumulate hazardous waste in tanks (40 CFR 265.201).

C.2.1.2. Determination of When a Generator Becomes a Treatment, Storage, or Disposal Facility

Any generator (except some conditionally exempt small quantity generators (see 40 CFR 261.5 (g)), no matter what monthly waste output, who disposes of waste on site is classified as a treatment, storage, or disposal facility. A small quantity generator who stores waste on site for more than 180 days without seeking an extension is also classified as a hazardous waste storage facility, as is any large generator who stores waste on site for more than 90 days without seeking an extension. Every hazardous waste treatment, storage, or disposal facility must comply with 40 CFR 264 through 267 and 40 CFR 270, including requirements to apply for a permit and meet certain technical and financial responsibility requirements.

C.2.1.3. Biennial Reporting (40 CFR Part 262.41)

Large quantity generators must submit a biennial report of their hazardous waste generation and management activity by March 1 of every even-numbered year. In the report, the generator must identify each waste transporter and each TSD facility used throughout the year. The generator also must describe hazardous waste generated and shipped, efforts made to reduce the volume and toxicity of the waste, and changes made in the volume and toxicity of the waste compared with those achieved in previous years. For generators who treat, store, or dispose of wastes on-site, additional reporting is required on methods of treatment, storage, or disposal.

C.2.1.4. Document Retention Period

Large and small quantity generators must maintain copies of each manifest, exception report, test result, and waste analysis, for at least three years (40 CFR Part 262.40). Large quantity generators must maintain copies of their biennial report for the same period of time. This time period is automatically extended during the course of an unresolved EPA enforcement action regarding the regulated activity, or as requested by the Administrator.

The generator must keep a copy of each land disposal restriction notification form for at least 5 years (40 CFR Part 268.7).

C.2.1.5. Training, Preparedness, and Emergency Procedures (40 CFR Part 262.34(a)(4), (d)(5)(iii))

These sections, respectively, apply only to large or small quantity (between 100 and 1000 kg/month of hazardous waste) generators who store on-site for up to 90/180 days. The requirements in these sections state that, among other things, personnel must be familiar with emergency procedures to be followed in the event of spills, fires or other releases of hazardous wastes. Large quantity generators must establish an appropriate hazardous waste handling training program for their employees. Small quantity generators must ensure that employees handling hazardous wastes are familiar with proper waste handling procedures and that there is always a person on call or at the premises with responsibility for coordinating all response measures in the event of an emergency. Large quantity generators also must prepare for each facility a contingency plan designed to minimize hazards to human health or the environment from fires, explosions or any unplanned release of hazardous waste or hazardous waste constituents.

C.2.1.6. Exception Reporting (40 CFR 262.42)

If a signed manifest copy has not been received from the designated facility within 35 days of shipment, large quantity generators must contact the transporter and/or the designated facility to determine the status of the hazardous waste. If the manifest copy has still not been received at 45 days, an exception report must be submitted to the EPA (exception reports are submitted to the Regional Administrator or to appropriate EPA Regional Office). This exception report must include:

- A legible copy of the manifest, and
- A cover letter signed by the generator explaining efforts taken to locate the waste and the results of those efforts.

Small quantity generators must submit a legible copy of the manifest, with an indication that the generator has not yet received confirmation of delivery, to the appropriate Regional Administrator if they do not receive a signed copy of the manifest within sixty days of shipment. (States may impose more stringent requirements for exception reporting.)

C.2.2 Requirements for All Generators Other Than Conditionally Exempt Small Quantity Generators

C.2.2.1. Hazardous Waste Shipments

Hazardous wastes being shipped off site must go to a RCRA- permitted facility. Large and small quantity generators must complete a Uniform Hazardous Waste Manifest (40 CFR Part 262.20), which can usually be obtained from State environmental agencies. (Small quantity generators who have a contractual agreement with a reclaimer that specifies the waste types and frequency of shipments and states that the reclaimer provides the vehicle used to transport the waste do not need to manifest these wastes if they maintain a copy of the agreement in their files. See 40 CFR 262.20 for details.) The manifest must have enough copies to provide the generator, each transporter, and the owner or operator of the designated facility with one copy each for their records, and another copy to be returned to the generator. If the State to which the shipment is manifested supplies the manifest, then the generator must use that manifest. If the State to which the shipment is manifested does not supply the manifest, but the State in which the generator is located supplies the manifest and requires its use, then the generator must use that State's manifest. If neither of these States supplies the manifest, then the generator may obtain the manifest from any source.

C.2.2.2. Land Disposal Restriction Notification

To prevent wastes that can be safely treated or disposed of by other means from being land disposed, 40 CFR 268 sets up a series of restrictions on the land disposal of solid waste and methods of enforcing these restrictions. 40 CFR Part 268.7 requires that a written land disposal restriction notification be transmitted to the destination facility with each shipment of hazardous waste.

(1) The notification must be signed by the generator and must include the following:

- EPA hazardous waste number (e.g., F002);
- The corresponding treatment standard(s) (see 40 CFR 268.7(a)(1)(ii) for details);

- The manifest number associated with the shipment of waste; and
 - Waste analysis data, where available.
- (2) A copy of the written notification and certification statement must be filed with the associated manifest copies.

Most printing industry hazardous wastes are covered by the land disposal restrictions. For example, spent solvents that are hazardous wastes are banned from land disposal unless treated to appropriate levels.

C.2.2.3. Release or Threat of Release Reporting
(40 CFR Part 262.34)

In case of fire, explosion, or other release of hazardous material which could threaten human health outside the facility,, the generator must immediately notify the National Response Center at 800-424-8802 and be prepared to supply the following information:

- Generator name, address, and EPA Identification Number;
- Date, time, and type of incident;
- Quantity and type of hazardous waste(s) involved;
- Extent of injuries, if any;
- Estimated quantity and disposition of recovered material, if any; and
- For large quantity generators, an assessment of the actual or potential hazards to human health and the environment.

C.3 UNDERGROUND STORAGE TANK MANAGEMENT

Subtitle I of the Resource Conservation and Recovery Act (as amended) establishes a program to control and prevent leaks from underground storage tanks. Subtitle I covers underground storage tanks containing petroleum products and hazardous substances as defined

by Superfund¹⁵, except for hazardous waste storage tanks, which are regulated under Subtitle C of RCRA. A storage tank is defined as underground if 10 percent or more of the volume, including the volume of underground pipes, is beneath the surface of the ground. Thus a tank that is 90 percent aboveground is classified as an underground storage tank. Some types of underground storage tanks are not covered by Subtitle I. For example, in the printing industry, the following Subtitle I exceptions may apply: underground storage tanks storing heating oil used on the premises, septic tanks and other tanks for collecting waste water and storm water, flow-through process tanks, and emergency spill tanks that are emptied immediately after use.

If a facility in the printing industry owns or operates an underground storage tank that is not covered by any of the allowed exemptions, the facility must comply with the requirements set forth in 40 CFR 280 or, if the facility is located in a State authorized to carry out the Underground Storage Tank program, with the requirements of the approved State program. These generally include requirements for:

- Design, construction, installation, and notification;
- General operations;
- Release detection;
- Release reporting, investigation, and confirmation;
- Release response and corrective action (for petroleum underground storage tanks);
- Closure of underground storage tanks; and
- Financial assurance (for petroleum underground storage tanks).

¹⁵ See the next section for a partial listing of hazardous substances covered by Superfund.

**SUPERFUND AND EMERGENCY PLANNING AND COMMUNITY
RIGHT-TO-KNOW ACT**

Section D. SUPERFUND AND COMMUNITY RIGHT-TO-KNOW REQUIREMENTS

Laws: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or commonly known as Superfund) and Emergency Planning and Community Right-to-Know Act (EPCRA)

This section describes the reporting requirements established by the Comprehensive Environmental Response, Compensation and Liability Act (also known as CERCLA, or more commonly as Superfund) and the Emergency Planning and Community Right-to-Know Act. CERCLA is the Act that created the Superfund and set up a variety of mechanisms to address risks to public health, welfare, and the environment caused by hazardous substance releases. CERCLA was enacted in 1980 and, among other amendments, was amended in 1986 by Title I of the Superfund Amendments and Reauthorization Act (SARA). Title III of SARA is the Emergency Planning and Community Right-to-Know Act (EPCRA), which created an emergency planning framework and established the right of local governments and members of the public to obtain information on the hazards posed by potential toxic substance releases. This section does not address Superfund liability rules, but focuses instead on regulatory reporting requirements.

The relevant regulatory reporting requirements derived from these acts mandate the reporting of: (1) releases of CERCLA hazardous substances equal to or exceeding the reportable quantity to the National Emergency Response Center (40 CFR 302); (2) the presence of certain amounts of extremely hazardous substances at a facility (40 CFR 355 and 370); (3) the emergency release of certain extremely hazardous substances to the State and local emergency response authorities (40 CFR 355); and (4) other toxic chemical releases (40 CFR 372). Although these reporting requirements often use similar phrases, e.g., "reportable quantity," and "threshold planning quantity," these terms may have different definitions or may apply differently under various requirements.

D.1 REPORTING OF RELEASES TO THE NATIONAL RESPONSE CENTER

Substances deemed hazardous by CERCLA are listed in 40 CFR 302.4. Based on criteria that relate to the possibility of harm associated with the release of each substance, CERCLA assigns a substance-specific reportable quantity (RQ); RQs are either 1, 10, 100, 1000, or 5000 pounds (except for radionuclides). Appendix D lists RQs for some of the chemicals used in the commercial printing industry. Any person in charge of a facility (or a vessel) must immediately notify the National Response Center as soon as a person has knowledge of a release (within a 24-hour period) of an amount of a hazardous substance that is equal to or greater than its RQ. There are some exceptions to this requirement, including exceptions for certain continuous releases and for Federally permitted releases.

D.2 EMERGENCY PLANNING AND NOTIFICATION FOR EXTREMELY HAZARDOUS SUBSTANCES

For the purposes of emergency response planning, any facility that has an extremely hazardous substance present or Superfund hazardous substance present at or above threshold planning quantities needs to notify the State emergency response commission and the local emergency planning commission. Any facility producing, using, or storing a hazardous chemical, as defined by Occupational Safety and Health Administration (29 CFR 1910.1200), that releases a reportable quantity of an extremely hazardous substance or a Superfund hazardous substance must immediately notify the local emergency planning committee and the State emergency planning commission. (See 40 CFR 355 for further details concerning these reporting requirements.) Appendix E shows the threshold planning quantities and reportable quantities for some EPCRA-designated extremely hazardous chemicals used in the printing industry.

Some States have more stringent requirements than the federal regulations. For example, California requires businesses that handle "acutely hazardous materials" (at or below federal thresholds) to file a registration form and may require the business to prepare a risk management prevention plan.

D.3. REPORTING OF PRESENCE, STORAGE, OR USE OF HAZARDOUS CHEMICALS

The minimum threshold quantity for reporting hazardous chemicals present at the facility at any one time is 10,000 pounds; for extremely hazardous chemicals, the minimum threshold quantity for reporting is the lesser of 500 pounds or the threshold planning quantity (TPQ). Any facility that is required by OSHA's Hazard Communication Standard (29 CFR 1910.1200) to have Material Safety Data Sheets (MSDSs) for certain hazardous chemicals, and that has such chemicals above certain minimum threshold levels, must provide copies of the MSDSs for these substances or a list of the substances to the State emergency response commission, the local emergency planning commission, and the local fire department. In addition, facilities must annually submit to the State emergency response commission, the local emergency planning commission, and the fire department a Tier I report indicating the aggregate amount of chemicals (above threshold quantities) at their facilities, classified by hazard category. If any agency that receives a Tier I report requests a Tier II report requiring additional information, facilities must submit this second report to the agency within 30 days of receiving a request for such a report. Tier II reports include an inventory of all chemicals at the facility. Since several commonly used chemicals in the printing industry may be stored in quantities of 10,000 pounds or more, or above the TPQ, these chemicals will be subject to MSDS and Tier reporting requirements (40 CFR 370). The minimum threshold for reporting in response to requests for submission of an MSDS or a Tier II form under 40 CFR 370.21(d) or 370.25(c) is **zero**.

Many States and some communities have similar laws but with lower threshold planning quantities and additional reporting requirements. For example, California requires a business that handles "hazardous materials" (at lower thresholds than those set by EPA) to prepare business plans. Some cities regulate any amount of a hazardous chemical which businesses handle.

D.4 REPORTING REQUIREMENTS FOR RELEASES OF TOXIC SUBSTANCES

A facility in the printing industry that **has more than 10 employees and that manufactures, processes or otherwise uses more than 10,000 or 25,000 pounds per year of any toxic chemical listed in 40 CFR 372.65** must file a toxic chemical release inventory (TRI)

reporting form (EPA Form R) covering releases of these toxic chemicals (including those releases specifically allowed by EPA or State permits) with the EPA and a State agency. The threshold for reporting releases is 10,000 or 25,000 pounds, depending on how the chemical is used (40 CFR 372.25). Form R is filed annually, covers all toxic releases for the calendar year, and must be filed on or before the first of July of the following year. Appendix F lists toxic chemicals used by firms in the printing industry that are listed in the Toxic Release Inventory.

A supplier notification requirement exists for any business that imports, sells, or otherwise distributes a product containing listed toxic chemicals to provide notice as specified in 40 CFR 372.45 to recipients of the product. Except for singular instances listed in 40 CFR 372.45(d), printers should be aware that suppliers of products containing TRI chemicals are **required** to notify each printer (to whom the mixture or trade name product is sold or otherwise distributed from the facility) of the name of each toxic chemical and the percent by weight of each toxic chemical in the mixture or trade name product.

TOXIC SUBSTANCES CONTROL

Section E. TOXIC SUBSTANCES CONTROL

Law: Toxic Substances Control Act (40 CFR 700 to 799)

The Toxic Substances Control Act (TSCA), originally passed in 1976 and subsequently amended, applies to the manufacturers, processors, importers, distributors, users, and disposers of chemical substances or mixtures. The major sections of interest to this report, and their areas of coverage, are:

- Section 4, which authorizes EPA to require testing of certain chemical substances or mixtures to determine their potential risk to human health or the environment;
- Section 5, which grants EPA the authority to require testing of new chemical substances,
- Section 6, which provides EPA with the authority to regulate the manufacture, processing, distribution in commerce, and use and disposal of chemical substances; and
- Section 8, which requires manufacturers and others to keep required records and submit reports to EPA.

The major requirements having the potential to impact the printing industry are briefly described below. Printers should note that the importation of a chemical substance or mixture triggers numerous requirements under TSCA.

Pre-Manufacturing Notice Requirement (Section 5)

A business that manufactures or imports a new chemical substance, or that manufactures, imports, or processes a chemical substance for a significant new use, must notify EPA at least 90 days before manufacturing, importing, or processing the substance (40 CFR 720-723).

Reporting and Recordkeeping for Identified Chemical Substances (Section 8)

A business (except a "small business") that imports, manufactures, or processes chemical substances identified by EPA by rule must keep records and reports as required. Small businesses are required to reprint or keep records in some situations.

Records of Significant Adverse Reactions to Health or the Environment (Section 8)

A business that manufactures, imports, processes, distributes, or uses chemical substances and mixtures must keep records of significant adverse reactions to health or the environment as specified.

Notice of Substantial Risk of Injury to Health or the Environment Reporting Requirement (Section 8)

A business that (1) manufactures, imports, processes, or distributes in commerce a chemical substance or mixture, and (2) obtains information that reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment, must report as required to EPA.

General Import Requirements and Restrictions (Section 13)

Importers of chemical substances and mixtures are responsible for ensuring that chemical importation complies with TSCA just as domestic manufacturers are responsible for insuring that chemical manufacturing complies with TSCA. Importers who may be involved in the importation of inks or other substances should reference 40 CFR 707.20. Printers who import inks are subject to inventory reporting regulations under TSCA Section 8(a) and should reference 40 CFR 710.

In addition, Section 8(b) of TSCA requires EPA to compile and maintain a list (the TSCA Inventory) of all chemical substances manufactured or processed in the United States, and the printing industry is required to report the information necessary to allow EPA to develop and maintain the inventory.

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APPENDIX A

FEDERAL AIR REGULATIONS FOR GRAVURE AND FLEXOGRAPHIC PRINTERS

(Contact David Salman 919-541-0859).

40 CFR Part 60: Standards of Performance for New Stationary Sources

Subpart QQ - Standards of Performance for the Graphic Arts Industry: Publication Rotogravure

§60.430 The affected facility to which the provisions of this subpart apply is each publication rotogravure printing press. A facility that commences construction, modification, or reconstruction after October 28, 1980 is subject to the requirements of this subpart. The provisions do not apply to proof presses.

§60.432 During the period of performance testing, VOCs discharged to the atmosphere from any affected facility must be below 16 percent of the total mass of VOC solvent and water used at the facility during any one 30-day performance averaging period.

§60.433 Performance Test and Compliance Provisions

§60.434 Monitoring of Operations and Recordkeeping

§60.435 Test Methods and Procedures

Subpart FFF - Standards of Performance for Flexible Vinyl and Urethane Coating and Printing

§60.580 The affected facility to which the provisions of this subpart apply is each rotogravure printing line used to print or coat flexible vinyl or urethane products at any facility that begins construction, modification, or reconstruction after January 18, 1983.

§60.582 On and after the date on which the performance test required by §60.8 has been completed, each owner or operator subject to this subpart shall either: (1) Use inks with a weighted average VOC content less than 1.0 kilogram VOC per kilogram ink solids at each affected facility, or (2) Reduce VOC emissions to the atmosphere by 85 percent from each affected facility.

§60.584 Monitoring of Operations and Recordkeeping Requirements

§60.585 Reporting Requirements

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APPENDIX B

CLEAN WATER ACT: REPORTABLE QUANTITIES OF HAZARDOUS SUBSTANCES THAT MAY APPLY IN THE PRINTING INDUSTRY

Hazardous Substance	RQ in Pounds
Benzene	10
Carbon tetrachloride	10
Chloroform	10
Cyclohexane	1,000
Ethylbenzene	1,000
Formaldehyde	100
Hydrochloric acid	5,000
Propylene oxide	100
Styrene	1,000
Toluene	1,000
Xylene (mixed)	1,000

UNDERGROUND INJECTION CONTROL PROGRAM (40 CFR 144 AND 40 CFR 146)

The Office of Ground Water and Drinking Water is currently developing regulations for the Underground Injection Control Program (UIC) designed to expand control over the subsurface emplacement of fluids via injection wells. These new regulations, which will be amendments to 40 CFR Parts 144 and 146, should be proposed shortly. Parts 144 and 146 establish the general provisions, and criteria and standards for the Underground Injection Control Program. These parts, as amended by the future regulation, will set forth minimum federal requirements for the permitting, operating, monitoring, and closure of several types of shallow injection wells. When these regulations are finalized, restrictions will be placed on the operation of some types of shallow disposal wells, particularly wells that inject industrial type wastes.

It is possible that the owner of a print shop that is located in an area without sewers and relies on shallow waste injection wells to dispose of industrial and non-sanitary waste generated by the facility would be severely affected by these new regulations. If you need further information about the direction of these new regulations or about the UIC Program contact Lee Whitehurst at (202) 260-5532.

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APPENDIX C

C.1 NATIONAL PERMIT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REGULATIONS (40 CFR 122)

Permit application requirements are set forth in 40 CFR 122.21(f) and (g) for discharges of process wastewater, 40 CFR 122.21(k) for new sources and new discharges, 40 CFR 122.21(h) for non-process wastewater, and 40 CFR 122.26(c)(1) for storm water. Application requirements for variances are set forth in 40 CFR 122.21(m).

An application for a permit for process wastewater must include information on the location of the outfall(s), a line drawing showing the water flow through the facility (with a water balance), a description of average flows and the treatment of wastewater before discharge, and an estimate of the facility's actual production if an effluent limitation guideline applies (see below). In addition, the applicant must report quantitative data for every outfall for the following pollutants:

- Biochemical Oxygen Demand (BOD₅);
- Chemical Oxygen Demand (COD);
- Total Organic Carbon (TOC);
- Total Suspended Solids (TSS);
- Ammonia (measured as N);
- Temperature (both winter and summer); and
- pH.

The application also must report the results of any biological toxicity tests on its effluent that may have been conducted within the previous three years. Finally, the facility must provide information on its "effluent characteristics". Facilities in the industrial category of Printing and Publishing, and/or in Photographic Equipment and Supplies, will need to test for all 126 priority pollutants listed in 40 CFR 122 Appendix D. Table C.1 lists the 126 priority pollutants. Each

applicant also must indicate whether it knows or has reason to believe it discharges any of the other hazardous substances, or non-conventional pollutants located at 40 CFR 122 Appendix D. Quantitative testing is not required for the other hazardous pollutants; however, the applicant must describe why it expects the pollutant to be discharged and provide the results of any quantitative data about its discharge for that pollutant. Quantitative testing is required for the non-conventional pollutants if the applicant expects them to be present in its discharge. Table C.2 lists the non-conventional and hazardous pollutants likely to be discharges by printing facilities.

For the purpose of reporting on effluent characteristics in permit applications, there exists a small business exemption (40 CFR 122.21 (g)(8)) for all applicants for NPDES permits with gross total annual sales averaging less than \$100,000 per year (in second quarter 1980 dollars). This exempts the small business from submitting quantitative data on certain organic toxic pollutants (see 40 CFR 122.21 Table II, Appendix D). However, the small business must still provide quantitative data for other toxic pollutants (metals and cyanides) and total phenols, as listed in 40 CFR 122.21 Table III, Appendix D. The same regulations apply to the small business concerning the other hazardous pollutants and non-conventional pollutants as for the larger facilities (see previous paragraph).

"Standard permit conditions" apply to all NPDES permits and are contained in 40 CFR 122.41. These conditions describe the legal effect of the permit and its revocability, as well as explaining the affirmative defenses which may be available to a non-compliant permittee. Standard conditions also put the permittee on notice of penalties which may be assessed if the permit is violated. Standard permit conditions describe the permittee's duties and obligations during the effective period of the permit, including the duty to comply with all conditions in the permit. The permittee must maintain records of all monitoring information for a period of at least three years from the date of the sample, and monitoring results must be reported at the intervals specified in the permit. The NPDES permitting authority (either EPA or an approved State) is allowed to enter the facility at any reasonable time to conduct an inspection or to monitor

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activity. The NPDES permitting authority must be notified if the discharger knows or has reason to believe that any toxic discharge has exceeded any effluent limitation in the permit. Other generic requirements are also contained in this section of the permit.

Along with standard permitting conditions, NPDES permits contain technology and water-quality based effluent limitations, monitoring, reporting, and recordkeeping requirements, and, potentially, stormwater treatment provisions. Other site-specific conditions ("special conditions") may be imposed on facilities through their NPDES permits, including:

- Construction schedules
- Best Management Practices (BMPs)
- Additional monitoring for non-regulated pollutants of concern
- Spill prevention plans.

Table C.1 Priority Pollutants (#1-69)

acenaphthene	2,6-dinitrotoluene
acrolein	1,2-diphenylhydrazine
acrylonitrile	ethylbenzene
benzene	fluoranthene
benzidine	4-chlorophenyl phenyl ether
carbon tetrachloride	4-bromophenyl phenyl ether
chlorobenzene	bis (2 chloroisopropyl) ether
1,2,4-trichlorobenzene	bis (2-chloroethoxy) methane
hexachlorobenzene	methylene chloride
1,2-dichloroethane	methyl chloride
1,1,1-trichloroethane	methyl bromide
hexachloroethane	bromoform
1,1-dichloroethane	dichlorobromomethane
1,1,1-trichloroethane	trichlorofluoromethane*
1,1,2,2-tetrachloroethane	dichlorodifluoromethane*
chloroethane	chlorodibromomethane
bis (chloromethyl) ether*	hexachlorobutadiene
bis (2-chloroethyl) ether	hexachlorocyclopentadiene
2-chloroethyl vinyl ether (mixed)	isophorone
2-chloronaphthalene	naphthalene
para-chloro meta-cresol	nitrobenzene
chloroform (trichloromethane)	2-nitrophenol
2-chlorophenol	4-nitrophenol
1,2-dichlorobenzene	2,4-dinitrophenol
1,3-dichlorobenzene	4,6-dinitro-o-cresol
1,4-dichlorobenzene	N-nitrosodimethylamine
3,3'-dichlorobenzidine	N-nitrosodiphenylamine
1,1-dichloroethylene	N-nitrosodi-n-propylamine
1,2-trans-dichloroethylene	pentachlorophenol
2,4-dichlorophenol	phenol
1,2-dichloropropane	bis (2-ethylhexyl) phthalate
1,3-dichloropropylene	butylbenzyl phthalate
2,4-dimethylphenol	di-n-butyl phthalate
2,4-dinitrotoluene	di-n-octyl phthalate

*These chemicals have since been deleted from this list

Table C.1 Priority Pollutants (#70-129)

diethyl phthalate	heptachlor epoxide
dimethyl phthalate	alpha-BHC
benzo(a)anthracene	beta-BHC
benzo(a)pyrene	gamma-BHC
3,4-benzofluoranthene	delta-BHC
benzo(k)fluoranthene	PCB-1242
chrysene	PCB-1254
acenaphthylene	PCB-1221
anthracene	PCB-1232
benzo(ghi)perylene	PCB-1248
fluorene	PCB-1248
dibenzo(a,h)anthracene	PCB-1260
indeno(1,2,3-cd)pyrene	PCB-1016
pyrene	toxaphene
tetrachloroethylene	antimony
toluene	arsenic
trichloroethylene	asbestos
vinyl chloride	beryllium
aldrin	cadmium
dieldrin	chromium, total
chlordane	copper
4,4'-DDT	cyanide, total
4,4'-DDE	lead
4,4'-DDD	mercury
alpha-endosulfan	nickel
beta-endosulfan	selenium
endosulfan sulfate	silver
endrin	thallium
endrin aldehyde	zinc
heptachlor	TCDD

**Table C.2. Hazardous and Non-Conventional Chemicals
Used In the Printing Industry**

Hazardous Pollutants	Non-Conventional Pollutants
Cyclohexane	Barium, total
Formaldehyde	Phosphorus, total
Propylene oxide	Surfactants
Xylene	

C.2 EFFLUENT GUIDELINES AND STANDARDS FOR THE PRINTING INDUSTRY

A principal means for attaining water quality objectives under the Clean Water Act is the establishment and enforcement of technology-based effluent limitations, which are based on the pollutant control capabilities of available technologies, taking into consideration the economic achievability of these limitations and a number of other factors. Because of differences in production processes, quantities, and composition of discharges, separate standards are established for discharges associated with different industry categories. These standards are referred to as technology-based effluent limitation guidelines.

The provisions in 40 CFR Part 459 are applicable to point source discharges resulting from the development or printing of paper prints slides, negatives, enlargements, movie film, and other sensitized materials except that this part is not applicable to facilities processing 150 square meters (1600 square feet) per day or less. Effluent limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged from a photographic processing source after the application of the best practicable control technology currently available. The effluents regulated are silver, cyanide and pH. The effluent limitation maximum for any one day per 1000 m² of product is 0.14 kg silver and 0.18 kg cyanide. The effluent pH must be within the range 6.0 to 9.0.

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In the absence of effluent limitation guidelines for a facility category, permit writers established technology-based controls using their Best Professional Judgement to the extent EPA-promulgated effluent limitation guidelines are inapplicable (40 CFR 125.3(c)(2)). In essence, the permit writer undertakes an effluent guideline-type analysis for a single facility. The permit writer will use information such as permit limits from similar facilities using similar treatment technology, performance data from actual operating facilities, and the scientific literature. Best Professional Judgement may not be used in lieu of existing effluent guidelines.

C.3 WATER QUALITY-BASED EFFLUENT LIMITATIONS (40 CFR 131)

NPDES permits must also contain any more stringent permit limitations based on state water quality standards. Unlike the technology-based limitations discussed above, water quality-based controls focus on the effects of the discharge on the receiving water. Such limitations may be necessary for surface water discharges to protect local water quality.

States determine the appropriate uses of each water body within the State (e.g., drinking water supply, fishable/swimmable, agriculture). States then establish water quality standards, or maximum pollutant levels, for those bodies of water that are necessary to attain or maintain the designated use. An appropriate standard may be expressed as a numerical ambient water quality criterion (e.g., a specified amount of dissolved oxygen per unit of water). State standards also may include a narrative water quality criterion, i.e. no discharge of toxic pollutants in toxic amounts. Some states may allow for the attainment of water quality standards at some point within the receiving stream. Consequently, permit writers may calculate available dilution and determine a proper mixing zone (if allowed by the State) to develop an effluent limit.

APPENDIX D

CERCLA REPORTABLE QUANTITIES FOR SOME CHEMICALS USED IN THE PRINTING INDUSTRY

Chemical	Reportable Quantity (lbs)
Acetone	5,000
Ammonia	100
Benzene	10
Cadmium and compounds	1
Carbon tetrachloride	10
Chloroform	10
Chromium and compounds	1
Cumene	5,000
Cyclohexane	1,000
Dibutyl phthalate	10
Ethanol, 2-ethoxy	1,000
Ethyl acetate	5,000
Ethylbenzene	1,000
Formaldehyde	100
Hydrochloric acid	5,000
Isophorone	5000
Lead and compounds	1
Methyl chloroform	1,000
Methylene chloride	1,000
Methanol	5,000
Methyl ethyl ketone	5,000
Methyl isobutyl ketone	5,000
Perchloroethylene	100
Phosphoric acid	5,000
Propylene oxide	100
Sulfuric acid	1,000
Toluene	1,000
Toluene diisocyanate	100
1,1,1-Trichloroethane	1,000
1,1,2-Trichloroethane	100
Trichloroethylene	100
Vinyl chloride	1
Xylene (mixed)	1,000

APPENDIX E

THRESHOLD PLANNING AND REPORTING QUANTITIES FOR SOME EPCRA-DESIGNATED EXTREMELY HAZARDOUS CHEMICALS USED IN THE PRINTING INDUSTRY

Chemical Name	Reportable Quantity (lbs)	Threshold Planning
Ammonia	100	500
Formaldehyde	100	500
Hydroquinone	1	500/10,000*
Propylene oxide	100	10,000
Sulfuric acid	1,000	1,000
Toluene 2,4-Diisocyanate	100	500

*Revised Threshold Planning Quantity based on new or re-evaluated toxicity data

APPENDIX F

CHEMICALS USED IN THE PRINTING INDUSTRY THAT ARE LISTED IN THE TOXIC RELEASE INVENTORY

TOXIC CHEMICALS

Acetone	Ammonia
Barium	Cadmium
Chromium	Copper*
Cumene	Cyclohexane
Methylene chloride	Ethylbenzene
Ethylene glycol	Ethylene oxide
Formaldehyde	Freon 113
Hydrochloric acid	Hydroquinone
Lead	Methanol
Methyl ethyl ketone	Methyl isobutyl ketone
Phosphoric acid	Silver
Sulfuric acid	Tetrachloroethylene
Toluene	Trichloroethylene
1,1,1-Trichloroethane	Xylene

*Copper phthalocyanine pigments delisted in May 1991