Background Report Reference

AP-42 Section Number: 10.8

Background Report Section: 4

Reference Number: 18

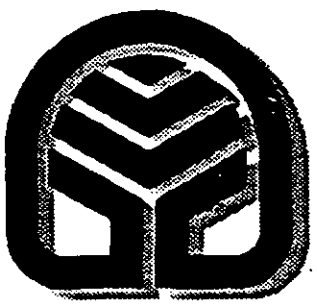
Title: TRI Reporting (form R) Guidiance Manual for Wood Preserving Facilities

American Wood Presevers Institute

1995

TRI Reporting (Form R) Guidance Manual for Wood Preserving Facilities

AP-42 Section Reference Report Sect. Reference 4 18



1995 Edition

produced and published by the
American Wood Preservers Institute
1945 Old Gallows Road, Ste. 150
Vienna, Virginia 22182-3931

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Published By

American Wood Preservers Institute
1945 Old Gallows Road, Suite 150
Vienna, Virginia 22182-3931
(703) 893-4005 · FAX (703) 893-8492

American Wood Preservers Institute
1945 Old Gallows Road, Suite 150
Vienna, Virginia 22182-3931
(703) 893-4005 • Fax (702) 893-8492

June 15, 1995

Dear AWPI Treater and Preservative Supplier Members:

RE: *TRI Reporting (Form R) Guidance Manual for Wood Preserving Facilities*

The Government Affairs Committee of the American Wood Preservers Institute is pleased to provide the *TRI Reporting (Form R) Guidance Manual for Wood Preserving Facilities* as a member benefit to AWPI pressure treaters and preservative suppliers.

This document builds upon existing work completed in 1990-91 by AWPI 313 Workgroup. The methodology utilized in the 1991 manual was based on physical and/or chemical relationships. The methodology incorporated herein continues to be useful for all wood treating facilities.

Over the past several years, the AWPI Clean Air Subcommittee has been working closely with the US EPA to quantify emissions from oil-borne wood treating facilities. This guidance document includes new procedures for calculating emissions from treating processes, storage tanks, and fugitive equipment losses using actual test data from creosote-treating facilities that have undergone peer and Agency review. In addition, pentachlorophenol emission factors were derived from the creosote factors using vapor pressure relationships and are also included in this manual. This gives the user new flexibility in selecting the methodology deemed most representative of his/her facility.

I would like to acknowledge the efforts of the Government Affairs Committee that made the production of this manual possible. I hope you find this manual to be a very useful tool, now and into the future.

Sincerely,

Gene S. Bartlow
President

American Wood Preservers Institute
1945 Old Gallows Road, Suite 150
Vienna, Virginia 22182-3931
(703) 893-4005 • Fax (702) 893-8492

MEMORANDUM

To: AWPI Members

From: Gene S. Bartlow, AWPI President

Subject: Confidential Disclosure Agreement

1. For the benefit and protection of AWPI members participating in this project, AWPI has included a Confidential Disclosure Agreement in this volume. Substantial expense has been incurred in researching, drafting, designing and producing this book. In order to safeguard this investment, AWPI recommends that any participant who intends to provide selected material, or the complete volume, to a third party, require the third party to sign this agreement.

2. The agreement allows you to share this confidential information with another person, such as a consultant, but it forbids that third party from sharing the information, including photocopies, with anyone else. In effect, this agreement prevents other parties from obtaining this valuable document for free.

3. To ensure the agreement is a *binding* Confidential Disclosure Agreement, you must take the following steps before sharing the book:

    a. Fill in the blanks with the appropriate information.

    b. Explain the agreement to the person who will sign it.

    c. Sign and date the agreement, noting the location where it was signed in the appropriate blank.

    d. Give a copy to the third party.

    e. Keep the *original* for your files.

4. If you have any questions regarding this agreement, please contact Heather Herndon at AWPI (703/893-4005).

CONFIDENTIAL DISCLOSURE AGREEMENT

THIS AGREEMENT made and entered into on the _____ day of _____, 1995, by and between _____ ("disclosing party"), and _____ ("receiving party").

Whereas disclosing party is willing to provide the confidential and proprietary information included in this volume to receiving party for the limited purpose and under the terms and conditions set forth in this agreement.

Now, therefore, in consideration of the mutual promises set forth herein, the parties agree as follows:

1. *Definition.* "CONFIDENTIAL INFORMATION" as used herein shall mean all information, calculations, and data contained in this volume entitled, "TRI Reporting (Form R) Guidance Manual for Wood Preserving Facilities" and the accompanying computer disk.

2. *Obligations.* In consideration of the disclosure to receiving party of CONFIDENTIAL INFORMATION, receiving party agrees to treat CONFIDENTIAL INFORMATION in confidence and to undertake the following additional obligations with respect thereto:

(a) to use CONFIDENTIAL INFORMATION for the sole purpose of providing consulting services for disclosing party;

(b) not to copy, in whole or in part, CONFIDENTIAL INFORMATION;

(c) not to disclose CONFIDENTIAL INFORMATION outside of receiving party;

(d) to limit dissemination of CONFIDENTIAL INFORMATION to only those employees who have a need to know to perform the limited tasks set forth in Item (a) above; and

(e) to return CONFIDENTIAL INFORMATION, including all records thereof, to disclosing party upon receipt of request therefor from disclosing party, or completion of the performance of services for disclosing party by receiving party, whichever occurs first.

3. *Survival.* The restrictions and obligations of Paragraph 2 of this Agreement shall survive any expiration, termination or cancellation of this Agreement and shall continue to bind receiving party, its successors, heirs and assigns.

4. *Negation of Licenses.* No rights or licenses, expressed or implied, are hereby granted to receiving party under any patents, copyrights or trade secrets of disclosing

party as a result or related to this Agreement.

5. *Governing Law.* This Agreement shall be construed and enforced in accordance with the laws of the state where this Agreement was executed.

6. *Entire agreement.* This Agreement embodies the entire understandings and obligations of the parties with respect to the subject matter hereof. No amendment or modification of this Agreement shall be valid or binding upon the parties unless made in writing and signed on behalf of each of the parties by their respective proper officers thereunto duly authorized.

In witness whereof the parties hereto have caused this Agreement to be executed by their duly authorized representatives.

Disclosing Party	*Receiving Party*
COMPANY:	COMPANY:
_____	_____
By (signature)	By (signature)
_____	_____
Name:	Name:
_____	_____
Title:	Title:
_____	_____
Date	Date:
_____	_____
Location:	Location:
_____	_____

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Executive Summary

The following guidance document was prepared on behalf of the American Wood Preservers Institute (AWPI) to provide member wood treaters with assistance in completing U.S. Environmental Protection Agency (EPA) Form R as per the Toxic Chemical Release Inventory reporting requirements (Section 313) of Community Planning and Right-to-Know Act (SARA Title III). Four wood-preserving systems are covered in this manual. They are:

1. Pentachlorophenol (PCP);
2. Creosote;
3. Chromated copper arsenate (CCA); and
4. Ammoniacal copper zinc arsenate (ACZA).

Each of these treating systems are addressed within the various sections of this report.

The AWPI prepared a guidance manual based on physical/chemical relationships in 1991 for members to use. EPA guidance recommends using test data and emission factors over physical/chemical relationships when estimating emissions. Thus, the manual has been updated to include procedures to calculate creosote emissions using plant test data and AP-42 calculations (for tanks). Where test data or emission factors (AP-42) are available, the original method based on physical/chemical relationships and the new method for creosote are both presented. A computer disk is provided for calculating emissions associated with the treatment processes, storage of the wood preservative, and fugitive equipment losses. Finally, a method for calculating emissions from a wastewater treatment system is recommended.

The procedures for calculating emissions provided in this guidance manual are summarized in Table 1.

As shown in Figure 1, a facility's first step is to determine if chemical releases must be reported. If a facility must report releases of creosote or PCP, the manual presents two methods for calculating the emissions. The first method is the one described in the 1991 Guidance Manual. This method is based on physical/chemical relationships and can be used for all wood treating facilities. The second method is based on plant operations monitoring data from a creosote treating facility. From the plant data, reference emission factors have been calculated for creosote and PCP and scaled to individual plants using operation temperatures and unit sizes. The PCP emission factors were derived from the creosote factors using vapor pressure relationships. A copy of the spreadsheets found on the enclosed computer diskette are presented in Exhibits AA1 and AB1. LOTUS 1-2-3® for Windows Version 1.0 and Excel® for Windows Version 5.0 versions of the spreadsheet are provided on the disk.

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Introduction

The following package was prepared by the American Wood Preservers Institute (AWPI) on behalf of its member wood treaters to provide them with assistance in completing U.S. Environmental Protection Agency (EPA) Form R as per the Toxic Chemical Release Inventory reporting requirements of Emergency Planning and Community Right-to-Know Act (EPCRA), Section 313, also known as SARA Title III or SARA 313. Four wood preserving systems are covered in this manual. They are:

1. Pentachlorophenol (PCP);
2. Creosote;
3. Chromated copper arsenate (CCA); and
4. Ammoniacal copper zinc arsenate (ACZA).

Each of these treating systems are addressed within the various sections of this report.

EPA guidance recommends using test data and emission factors over physical/chemical relationships when estimating emissions. The 1991 edition of this guidance manual has been updated to include procedures to calculate creosote and PCP emissions. The methods were updated using plant test data and the EPA document, Compilation of Air Pollutant Emission Factors (PB 86-124906) known as AP-42 calculations. A disk is provided for these calculations as well as for calculating fugitive emissions from valves, flanges, and pumps.

Briefly, SARA 313 requires firms in certain industrial classifications to estimate the releases of a chemical found on the "Section 313 Toxic Chemical List for Reporting Year 1994", provided in Appendix 1, from their facility if:

1. Ten or more people are employed by the facility; and
2. The amount of the chemical used or processed at the facility exceeds a particular threshold.

If these criteria are met, a Toxic Chemical Release Inventory Reporting Form (EPA Form R) must be completed and submitted prior to July 1 of the following year (i.e., Form Rs covering emissions from 1994 must be submitted by July 1, 1995).

This package summarizes the reporting requirements, presents sample calculations for determining which chemicals must be reported, and suggests techniques for estimating releases. While this report is intended to be comprehensive, the EPA package titled "Toxic Chemical Release Inventory Reporting Form R and Instruction" (EPA 745-K-95-051) for 1994 should be used in conjunction with this report. The package can be obtained from the EPA by calling the Title III Hotline at 1-800-535-0202. If you have submitted a Form R in the past, you should have received the package by mail along with a computer disk.

The following actions are recommended as soon as possible:

1. Obtain the EPA package titled "Toxic Chemical Release Inventory Reporting Form R and Instruction" (EPA 745-K-95-051).

2. Determine the exact longitude and latitude of your facility. (If this is not known, contact USGS at (303) 236-5829.)
3. Determine if your facility must report any chemicals under 313, and if so, which ones. (See Section III, page 3 of this guide.)
4. If you must report, review Section IV, page 6 of this guide, Overview of Facility Data for 313 Reporting, and begin assembling the appropriate data.

Changes Effective for 1995 Report

(Due July 1, 1996)

On November 30, 1994, EPA published a final rule increasing the SARA Title III list (see Appendix 3) by adding 286 new compounds (59 FR 61432). If your facility manufactures, processes, or otherwise uses any of these compounds above the threshold during 1995, you are required to submit a Form R report for the compound by July 1, 1996. EPA may add more chemicals to the list in the future. In another rulemaking on November 30, 1994 (59 FR 61488), EPA established a streamlined reporting option for facilities with low annual reportable amounts of a listed toxic chemical. The alternate threshold rule effective date is January 1, 1995. This option applies for reporting a compound if the facility manufactures, processes, or otherwise uses one million pounds or less of the compound annually and if 500 pounds or less of that chemical is present in their annual reportable amount. Instead of submitting a Form R for the chemical, the facility must submit an annual certification for the chemical and maintain records on the calculations. Information on both rulemakings is included in your 1994 instruction booklet from the EPA.

Reporting Overview

Form R (see Appendix) requires estimates of "Releases of the Chemical to the Environment On-site" (Form R, Part III, Section 5). These releases are broken down into five categories:

1. Fugitive or non-point air emissions;
2. Stack or point air emissions;
3. Discharges to receiving streams or water bodies;
4. Underground injection; and
5. Releases to land.

"Releases to land" are further broken down into:

1. On-site landfill;
2. Land treatment/application farming;
3. Surface impoundment; and
4. Other disposal.

The following is a discussion of which possible releases from a wood preserving facility would fall under each category. The releases and a summary of the approach provided in this guidance manual are presented in Table 1.

For categories with more than one contributing source, a single release estimate is made for Form R. Thus the four sources of fugitive emissions referenced above would be totaled and entered in 5.1 of Part III of Form R.

Determination of Reportable Chemicals

A facility must report release of SARA 313 chemicals by submitting the annual Form R report if it meets the following criteria:

1. Facility is classified by Standard Industrial Classification (SIC) Codes 20-39;
2. Facility employs 10 full-time employees; and
3. Facility manufactures, processes, or otherwise uses SARA 313 chemical above the threshold amount.

The steps to determine if you must report are summarized in Figure 1.

The wood preserving industry is classified as SIC Code 2491. Therefore, this industry is subject to Form R reporting if the other criteria are met. A full time employee is defined by EPA as 2,000 hours of work per year. Therefore, if your facility accounts for 20,000 hours of work per year, it is considered to employ 10 people. If this is not the case, you do not need to prepare or submit any reports for SARA 313.

Once you have determined that a facility employees ten or more full time employees, you must review the list of chemicals covered by SARA 313 and presented in Appendix 1. As an additional source of information, the Material Safety Data Sheet (MSDS) should indicate whether or not the chemical is subject to 313 reporting requirements. If this information is not included on the MSDS of a product which you suspect may contain a listed chemical, the AWPI suggests that you contact your supplier.

A list of wood treating chemical components which are known to be on the 313 list is provided in Table 2. For your convenience, the Chemical Abstracts Service (CAS) number and name of the chemical as it is to be reported on Form R are also listed. Note that the metallic oxides found in arsenical treating solutions are reported based on the release of the parent metal and not the metal oxide. However, the threshold determination is based on the amount of the metal oxide used or processed. Also, you may wish to check with your chemical supplier to confirm that no other compounds subject to 313 reporting are present above *de minimis* levels (see discussion below of "*de minimis*") in the chemicals that you purchase.

TABLE 1. SUMMARY OF PROCEDURES FOR CALCULATING EMISSIONS

SECTION OF FORM R, III	APPLICABLE WOOD PRESERVING OPERATION	1991 CALCULATION METHOD (For 4 wood preservatives)	1995 CALCULATION METHOD (for PCP and creosote emission factors)	COMMENTS
5.1 Fugitive or non-point air emissions	1) Fugitive emissions from valves, pumps, flanges, vents and pressure relief valves.	SOCMI Factors	SOCMI/reference facility	Disk spreadsheet provided
	2) Fugitive emission from opening the retort after treating a charge of material.	Q*	Test Data/reference facility	Disk spreadsheet provided
	3) Non-point source emissions from treated material stored on-site (ACZA).	Guidance Factor	–	
	4) Releases of organic compounds from process water or wastewater treatment.	Assumption	WATER 8/reference facility	Disk spreadsheet provided
	5) Releases from sumps	–	WATER 8/reference facility	Disk spreadsheet provided
	6) Releases from sap tanks.	–	WATER 8/reference facility	Disk spreadsheet provided
5.2 Stack or point air emissions	1) Vacuum system exhaust air emissions	Q*	Test Data/reference facility	Disk spreadsheet provided
	2) Dry kiln emissions (CCA).	Emission Factor	–	
	3) Tank venting emissions	Q*	AP-42/reference facility	Disk spreadsheet provided
5.3 Discharges to receiving streams or water bodies	1) Storm water run-off	–	–	
5.4 Underground injection	NOT APPLICABLE	–	–	
5.5 Releases to land.	NOT APPLICABLE	–	–	
5.5.1 On-site landfill.	1) Only applicable if your facility is actively land filling material containing reportable chemicals on-site.	–	–	
5.5.2 Land treatment/application farming	1) Only applicable if your facility is actively land farming material containing reportable chemicals on-site.	–	–	
5.5.3 Surface impoundment.	1) Discharges to active surface impoundments.	–	–	
5.5.4 Other disposal.	1) Spills which were not excavated and shipped off-site.	–	–	
6.1 6.1.1.	Discharges to POTW	–	WATER 8/reference facility	Disk spreadsheet provided

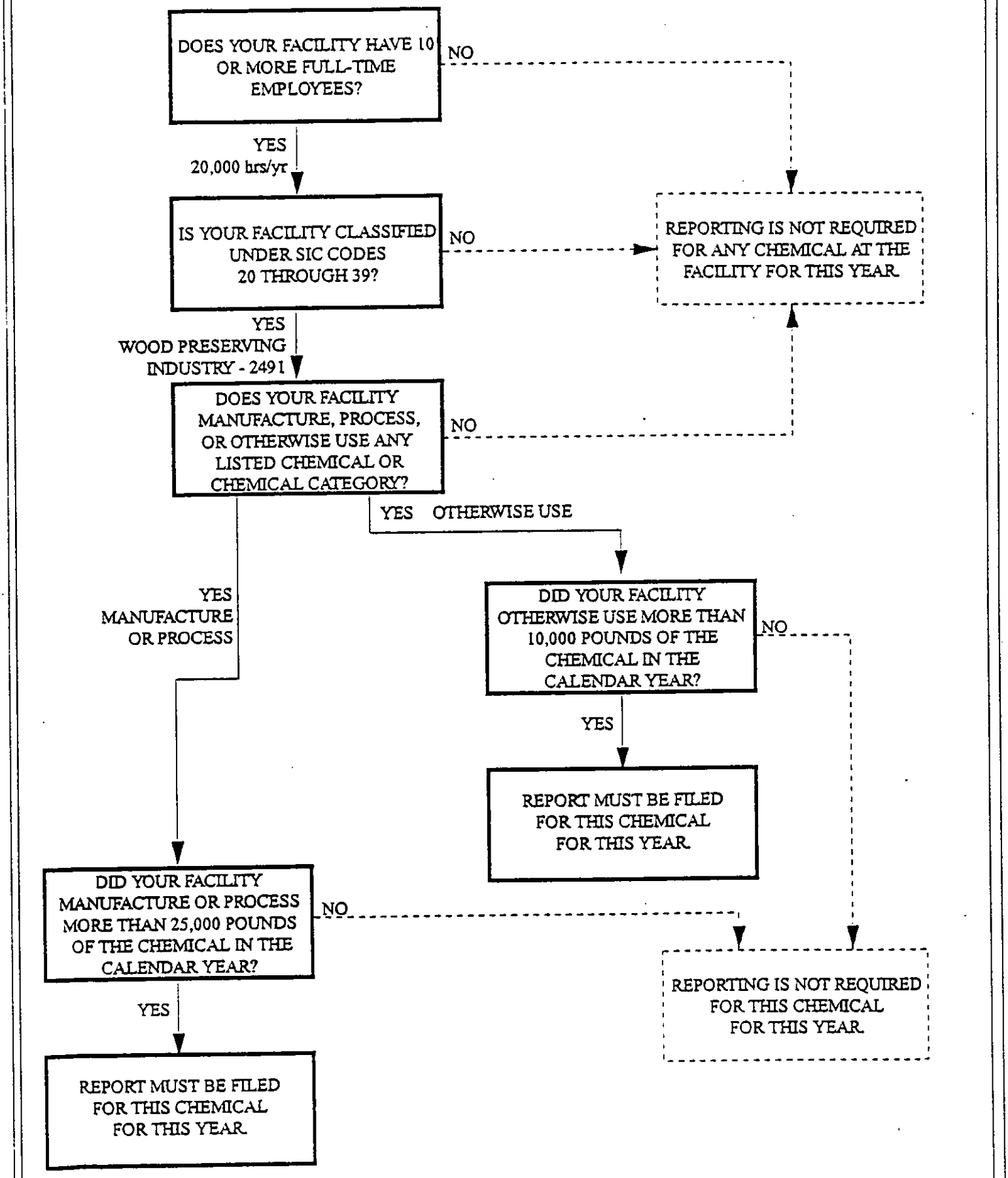

FIGURE 1

DETERMINING APPLICABILITY OF SECTION 313 REQUIREMENTS

Table 2. Wood Treating Chemical Components Known to be on the 313 List

Chemical	313 Chemical	CAS Number
pentachlorophenol	same	87-86-5
creosote	same	8001-58-9
copper (1)	copper	7440-50-8
copper oxide	copper compounds	NA
arsenic pentoxide	arsenic compounds	NA
zinc oxide	zinc compounds	NA
chromium oxide	chromium compounds	NA
ammonia	same	7664-41-7

Note:
1 For reporting purposes, you have the option of 1) filing a single report for copper compounds covering both copper and copper oxide (file as copper compounds with NA as the CAS number); or 2) filing two separate reports.

Having determined that your facility employs ten or more people and that a chemical is subject to 313 requirements, you must determine if that chemical is "manufactured, processed or otherwise used" above the threshold level. These terms are defined below:

1. **Manufacture** means to produce, prepare, compound, or import a listed chemical. The only wood preserving operation that the Work Group is aware of which would be defined as manufacturing is the manufacture of copper oxide from copper when preparing ammoniacal copper zinc arsenate (ACZA).
2. **Process** refers to the preparation of a listed chemical for sale or distribution. Wood treating involves the "processing" of treatment chemicals and solutions. Consequently, most of the chemicals at your plant are processed by your facility.
3. **Otherwise used** simply means any activity not covered by the terms "manufacture" or "process". Water treatment chemicals and equipment cleaning solvents would fall into this category.

If a chemical is "processed" or "manufactured" in quantities of 25,000 pounds or more, a Form R must be submitted. Form R reports are chemical specific; a complete report must be submitted for each chemical. Typically, pressure treatment using wood preserving pesticides is considered processing. If the chemical is "otherwise used" in quantities of 10,000 pounds or more, a Form R must be submitted.

Threshold determinations must be made on each manufacturing, processing, or "other use" operation. This point is illustrated by the preparation of and treatment with ACZA. If your facility treats with ACZA, you receive copper metal, react the copper metal with oxygen to produce copper oxide, and then treat wood with copper oxide. In doing so, you have "processed" copper metal, "manufactured" copper oxide, and finally "processed" copper oxide. If the applicable threshold for any operation is exceeded, emissions of that chemical from all

operations must be reported. For example, if your facility processes 5,000 pounds of cupreous oxide (*i.e.*, copper compound below threshold of 25,000 pounds) and manufactures 30,000 pounds of cupric oxide (*i.e.*, copper compound above threshold), then the emission of copper from both operations, as well as any other operation which involves copper compounds, must be reported.

Also, threshold determinations are made for the compound whereas reporting is only for the parent metal content. So in the cupreous/cupric example, only releases of the copper would be reported under the category "copper compounds".

Rules for threshold determinations can be summarized as follows:

1. Threshold determinations are conducted separately for material which is processed, material which is manufactured, and material which is "otherwise used";
2. If a threshold determination is exceeded for any operation, all releases from all processes which use that chemical above a *de minimis* level (see below for discussion of "*de minimis*") must be included in the calculation of the amount released; and
3. Uses of chemicals or members of the same chemical category are added within each threshold category (*i.e.*, the amount of several different copper compounds which are "processed" would be added together to determine if the reporting threshold had been exceeded).

If the chemical is part of a mixture, then only that portion of the mixture is considered in the threshold calculation. Also, chemicals present below *de minimis* levels need not be considered. For non-carcinogens, *de minimis* means less than one percent (1%) by weight. For carcinogens, *de minimis* means less than one tenth of one percent (0.1%) by weight. If in doubt, contact your chemical supplier.

The basic approach to determine if the 313 thresholds have been exceeded is the same for any chemical and is as follows:

1. Determine total pounds processed or used by adding the beginning inventory to the purchases for the year and subtracting the ending inventory. (Note: if your inventory is kept in gallons or some other basis, it must be converted to pounds.)
2. Determine the weight percent of 313 compounds in the total.
3. Calculate the pounds of each 313 compound processed or used by multiplying the total pounds processed or used by the weight percent for that compound.
4. Compare the pounds processed or used of each compound to the appropriate reporting threshold (i.e., 25,000 pounds).
5. If the threshold is exceeded, a 313 report (EPA Form R) must be completed and submitted for that compound.

Exhibits A1 through A4 present sample threshold calculations for creosote, PCP, CCA, and ACZA.

Overview of Form R Reporting

Information needed to complete Form R includes:

1. Your facility Dun & Bradstreet Number;
2. The exact longitude and latitude of your plant;
3. Your facility EPA Identification Number;
4. The name and address of your local POTW, if applicable (i.e., if you discharge to it);
5. The name, address, and EPA Identification Number of any off-site disposal facility which received waste from your facility for the reporting year; and
6. The amount of 313 chemicals released in pounds.

The majority of the release estimates from the 1991 Form R Guidance Manual and presented here are based on:

1. Average cycle times, including the average composition of the cycle (i.e., the portion of the cycle time for pressurization, the portion for vacuum, etc.);
2. Average cycle volumes (i.e., cubic feet of material treated per charge or cycle); and
3. The number of charges or cycles run in the reporting year.

The amount of preservative purchased is also used for some estimates. Also presented are release estimates for PCP and creosote emissions based on plant test data and EPA emission factors. The emissions from a facility are calculated by inputting plant-specific data into the enclosed spreadsheet.

Release Estimation

The following section describes the suggested methods for estimating releases of 313 chemicals for Form R reporting. In addition to reporting your estimate of releases, you are also required to give your basis for the estimate. This is reported as:

1. "M", indicating that the estimate is based on monitoring data or actual measurements of the releases;
2. "C", indicating a mass balance;
3. "E", referring to a published emission factor; or
4. "O", meaning the estimate is based on some other approach, such as an engineering calculation or simply your best guess.

All of the suggested factors and techniques described in this section should be considered "other approaches" (O).

If you have specific data available or feel that another approach provides a better estimate for your particular site, you should use it rather than the factors described herein. The intent of this guidance document, is to provide assistance in making a best estimate. Keep in mind that each facility is ultimately responsible for the reports submitted concerning that site. To the greatest extent possible, the underlying assumptions of the factors and approaches suggested herein are stated to allow you to tailor them to the specific conditions of your facility.

Emission Estimation for Creosote-Wood-Treating Facilities

A spreadsheet is provided with this guidance manual to assist you in calculating the following emissions from a creosote wood-treating facility:

- Retort door (fugitive and non-point);
- Equipment losses (fugitive and non-point);
- Wastewater treatment system (choose point or fugitive and non-point);
- Sap tanks and sumps (fugitive and non-point);
- Treatment cycle (point); and
- Work and storage tanks (point).

A copy of the spreadsheet is provided in Exhibit AA1. The equations are shown in Exhibit AA2. In addition, the 1991 Form R Guidance Manual procedures for calculating these emissions for individual units are found in the sections that follow.

EPA guidance recommends the use of test data and emission factors over physical/chemical relationships for estimating emissions. Emission data from a creosote treating facility have become available since the dissemination of the 1991 Form R Guidance Manual. The data were used to calculate reference emission rates for the treatment process of green and dry wood and for fugitive emissions from the retort door. These emission rates have been utilized in a spreadsheet for calculating Form R emissions for creosoting facilities. The retort door emission rate is scaled to your facility by inputting the number of charges per year, number of retort chambers, time the door is open, and the retort cylinder volume. For the process emissions, the emission factor is scaled to your facility by inputting the retort volume, number of green charges, and the number of dry charges. The spreadsheet allows you to specify whether or not the rueping air is vented to the atmosphere.

The spreadsheet also incorporates fugitive equipment losses. The Synthetic Organic Chemical Manufacturing Industry (SOCMI) is recognized as a source of emission factors for several industries and process units. SOCMI fugitive emission factors were developed for the petroleum industry but have been adjusted by dividing by 10 to account for the low volatility of creosote (see the Fugitive Air Emissions section).

The spreadsheet includes revised calculations for breathing and working loss calculations for work tanks and storage tanks. These calculations are also in accordance with AP-42. Working and breathing losses are added to determine the total tank emissions. For creosote storage tanks, the spreadsheet uses the AP-42 calculations modified for creosote (product factor of 0.10). For work tanks, the calculations include the option of creosote recycling. AP-42 requires an input of number of tank turnovers per year. This is calculated by dividing the volume of material purchased by the volume of the tanks. For work tanks, a portion of creosote is recycled and combined with a volume of creosote added from the storage tank during each cycle. The equivalent number of tank turnovers is then the amount of creosote purchased plus the amount of creosote recycled, divided by the volume of the work tanks.

Calculations are provided on the spreadsheet for wastewater treatment plant emissions. You can specify point source emissions (covered) or fugitive and nonpoint emissions (uncovered). The reference facility emission factor was determined by using Water8. The reference facility was assumed to have two primary oily water separators, one secondary separators, and one aeration basin. Due to model limitations, naphthalene was used as the constituent and the concentration in the influent was assumed to be saturation (31 mg/L). The model-derived values for naphthalene were converted to creosote by dividing them by 0.42 (the percentage of naphthalene in creosote vapor). The reference facility is scaled to your facility by inputting the flow in gallons per minute.

AP-42 emission factors were used to calculate emissions from sap tanks and sumps. The input for the spreadsheet is the number of units.

Spreadsheet Use (Creosote)

The spreadsheet can be run in either Lotus 1-2-3 for Windows or in Excel for Windows. Simply open the file titled SARA_GEN.WK3 as you would any normal spreadsheet (Excel users should select file type "Lotus 1-2-3") and enter the following input in the appropriate location:

1. Enter the volume of wood treated at the facility in the reporting year in cubic feet.
2. Enter the average volume of wood treated per charge in cubic feet.

3a. Enter the length of a retort chamber in feet.
3b. Enter the diameter of a retort chamber in feet.
3c. Enter the number of retorts used at the facility.

4. Enter the annual purchases of creosote during the reporting year in gallons.
5. Enter the average volume of creosote used during a treatment cycle in gallons.

6a. Enter the number of green wood cycles performed in the reporting year.
6b. Enter the number of dry wood cycles performed in the reporting year.

7a. Enter the flow rate of wastewater in gallons per minute.
7b. Enter whether the wastewater is considered to be a point source or a fugitive source.
8a. Enter the capacity of a single storage tank in gallons.
8b. Enter the number of storage tanks at the facility.
8c. Enter whether pressure vacuum relief valves (PVRVs) are employed on the storage tanks.
8d. Enter whether Equalization Lines are employed on the storage tanks.
9a. Enter the capacity of a single work tank in gallons.
9b. Enter the number of work tanks at the facility.
9c. Enter whether PVRVs are employed on the work tanks.
9d. Enter whether Equalization Lines are employed on the work tanks.
10. Enter whether rueping air is vented to the atmosphere or back to the work tanks.
11a. Enter whether a steam drying process is employed at the facility.
11b. Enter the steam flow rate during the steam drying process in gallons per minute.
11c. Enter the duration of a steam dry cycle in hours.
11d. Enter the number of steam dry cycles performed in the reporting year.
12a. Enter whether a final steam and flashing process is employed at the facility.
12b. Enter the steam flow rate during the final steam and flashing process in gallons per minute.
12c. Enter the duration of a final steam and flash cycle in hours.
12d. Enter the number of final steam and flash cycles performed in the reporting year.
13a. Enter whether a phase separation reclaim tank is employed at the facility.
13b. Enter the volume of creosote sent to the reclaim tank in the reporting year in gallons.
14a. Enter whether a heated reclaim tank is employed at the facility.
14b. Enter the volume of creosote sent to the reclaim tank in the reporting year in gallons.
15a. Enter the number of sump tanks employed at the site.
15b. Enter the number of sap tanks employed at the site.
15c. Enter the number of pump seals employed at the site.
15d. Enter the number of valves employed at the site.
15e. Enter the number of flanges employed at the site.
16. Enter the time the retort door is left open per cycle in hours.

Emission Estimation: PCP Wood-Treating Facilities

A spreadsheet is provided with this guidance manual to assist you in calculating the following emissions from a PCP wood-treating facility:

- Retort door (fugitive and non-point);
- Equipment losses (fugitive and non-point);
- Wastewater treatment system (choose point or fugitive and non-point);
- Sap tanks and sumps (fugitive and non-point);
- Treatment cycle (point); and
- Work and storage tanks (point).

A copy of the spreadsheet is provided in Exhibit AB1. The equations are shown in Exhibit AB2. The 1991 Form R Guidance Manual procedures for calculating these emissions for individual units are found in the sections that follow.

USEPA guidance recommends the use of test data and emission factors over physical/chemical relationships for estimating emissions. Reference PCP emission rates were calculated from treating data using creosote plant data and vapor pressure relationships. The enclosed spreadsheet is used to scale the rates to your facility. For the retort door emissions (fugitive and non-point), the emission rate is scaled to your facility by inputting the number of charges per year, number of retort chambers, time the door is open, and the retort cylinder volume. For the emissions from processes (fugitive and non-point emissions), the emission rate is scaled to your facility by inputting the retort cylinder volume, number of green charges, and the number of dry charges. The spreadsheet allows you to specify whether or not rueping air is vented to the atmosphere.

The spreadsheet includes revised calculations for breathing and working loss calculations for work tanks and storage tanks. These calculations are also in accordance with AP-42. Working and breathing losses are added to determine the total tank emissions. For PCP storage tanks, the spreadsheet uses the AP-42 calculations modified for PCP (product factor of 0.01). For work tanks, the calculations include the option of PCP recycling. AP-42 requires an input of number of tank turnovers per year. This is calculated by dividing the volume of material purchased by the volume of the tanks. For work tanks, a portion of PCP is recycled and combined with a volume of PCP added from the storage tank during each cycle. The equivalent number of tank turnovers is then the amount of PCP purchased plus the amount of PCP recycled, divided by the volume of the work tanks. Calculations are provided on the spreadsheet for wastewater treatment plant emissions. You can specify point source emissions (covered) or fugitive and nonpoint emissions (uncovered). The reference facility emission factor was determined by using Water8 for naphthalene and converting to PCP using vapor pressure relationships. The reference facility was assumed to have two primary oily water separators, one secondary separator, and one aeration basin. The concentration of naphthalene in the influent was assumed to be saturation (31 mg/L). The reference facility is scaled to your facility by inputting the flow in gallons per minute.

AP-42 emission factors were used to calculate emissions from sap tanks and sumps. The input for the spreadsheet is the number of units.

Spreadsheet Use (PCP)

The spreadsheet can be run in either Lotus 1-2-3® for Windows or in Excel® for Windows. Simply open the file titled SARA_PCP.WK3 as you would any normal spreadsheet (Excel users should select file type "Lotus 1-2-3") and enter the following input in the appropriate location:

1. Enter the volume of wood treated at the facility in the reporting year in cubic feet.
2. Enter the average volume of wood treated per charge in cubic feet.

3a. Enter the length of a retort chamber in feet.
3b. Enter the diameter of a retort chamber in feet.
3c. Enter the number of retorts used at the facility.

4. Enter the annual purchases of pentachlorophenol during the reporting year in gallons.
5. Enter the average volume of pentachlorophenol used during a treatment cycle in gallons.

6a. Enter the number of green wood cycles performed in the reporting year.
6b. Enter the number of dry wood cycles performed in the reporting year.

7a. Enter the flow rate of wastewater in gallons per minute.
7b. Enter whether the wastewater is considered to be a point source or a fugitive source.

8a. Enter the capacity of a single storage tank in gallons.
8b. Enter the number of storage tanks at the facility.
8c. Enter whether pressure vacuum relief valves (PVRVs) are employed on the storage tanks.
8d. Enter whether Equalization Lines are employed on the storage tanks.

9a. Enter the capacity of a single work tank in gallons.
9b. Enter the number of work tanks at the facility.
9c. Enter whether PVRVs are employed on the work tanks.
9d. Enter whether Equalization Lines are employed on the work tanks.

10. Enter whether rueping air is vented to the atmosphere or back to the work tanks.

11a. Enter whether a steam drying process is employed at the facility.
11b. Enter the steam flow rate during the steam drying process in gallons per minute.
11c. Enter the duration of a steam dry cycle in hours.
11d. Enter the number of steam dry cycles performed in the reporting year.

12a. Enter whether a final steam and flashing process is employed at the facility.

12b. Enter the steam flow rate during the final steam and flashing process in gallons per minute.
12c. Enter the duration of a final steam and flash cycle in hours.
12d. Enter the number of final steam and flash cycles performed in the reporting year.
13a. Enter whether a phase separation reclaim tank is employed at the facility.
13b. Enter the volume of pentachlorophenol sent to the reclaim tank in the reporting year in gallons.
14a. Enter whether a heated reclaim tank is employed at the facility.
14b. Enter the volume of pentachlorophenol sent to the reclaim tank in the reporting year in gallons.
15a. Enter the number of sump tanks employed at the site.
15b. Enter the number of sap tanks employed at the site.
15c. Enter the number of pump seals employed at the site.
15d. Enter the number of valves employed at the site.
15e. Enter the number of flanges employed at the site.
16. Enter the time the retort door is left open per cycle in hours.

Emissions Estimation: Fugitive Air Emissions

Probably the most difficult source to estimate is that of fugitive air emissions from process equipment, such as pumps, valves, flanges, and the pressure vacuum relief valves (PVRV) on the retort or tanks. Many treaters have used the SOCMI factors to make these estimates. However, because creosote and pentachlorophenol are semi-volatile compounds and not volatile compounds, these factors are inappropriate. This was confirmed by the AWPI Work Group in a conversation with Mr. David Markwordt of EPA's Office of Air Quality Planning and Standards in Durham, North Carolina on January 12, 1989. While Mr. Markwordt confirmed that the SOCMI factors are inappropriate, he would not give his "approval" to any other technique. SOCMI factors have been shown to be conservative. The Work Group investigated the cost and practicality of conducting an emissions study of the wood preserving industry, and concluded that the cost of such a study was prohibitive.

At this time, the AWPI has not received any hard data upon which to base an alternative emission factor. Therefore, based on the ambient vapor pressures of metal compounds found in arsenical solutions, pentachlorophenol, and creosote relative to typical volatile organic compounds, the following is recommended:

1. For metal oxides in aqueous solutions (i.e., CCA and ACZA), assume fugitive emissions to be zero;
2. For creosote solutions, divide the SOCMI factors by 10;
3. For pentachlorophenol solutions, divide the SOCMI factors by 100; and
4. For ammonia emissions from ACZA solutions, use straight SOCMI factors.

The SOCMI factors are given in units of pounds per hour per component where a component is a pump, valve, or flange. To use these factors:

1. Count the number of each type of component (i.e., number of valves) in the system being considered;
2. Calculate the number of hours the system is in service (average cycle time multiplied by the number of charges treated in the system per year);
3. Multiply the number of components by the total hours and the appropriate factor to obtain an estimate in pounds released per year; and
4. Determine whether raw material, water solution, or vapor is in the component.

The factors recommended by the Work Group are presented in Exhibit B1.

When applying these factors to solutions or vapor streams which are only partially composed of the 313 chemicals for which the emission estimate is being made:

1. Use the factor to estimate the total pounds released, and then;
2. Use the weight percent of the 313 chemical in the fluid (i.e., gaseous mixture or liquid solution) to estimate the release of the 313 chemical.

Exhibit B2 estimates the vapor weight fraction of each 313 chemical based on temperature and liquid concentration.

Example calculations are presented in Exhibits B3 through B6 using the adjusted SOCMI factors described above as presented in the 1991 Guidance Manual. In addition, a disk version spreadsheet for creosote wood treating fugitive emissions calculations is provided.

Finally, a more accurate estimate can be obtained by breaking the treating cycle into stages and doing separate calculations for each stage. This accounts for the fact that every valve or pump in the treating system does not "see" the fluid for the entire treating cycle. This approach will substantially reduce the emission estimate; however, it will also increase the complexity and difficulty of the calculation. For those interested in using this method, a work sheet and brief explanation can be found in Exhibit B6. Exhibit B7 presents a sample calculation for pentachlorophenol which reduces the release estimate by roughly 75% relative to the unsegmented approach. A blank work sheet is provided in Exhibit B8. [Note: For those using computers to make estimates, the work sheet can easily be placed on a spreadsheet resulting in significant time savings in making estimates of fugitive emissions.]

Emission Estimation/Non-point Air Sources: Treated Storage (ACZA)

The volatilization of ammonia from the freshly treated wood is part of the process which immobilizes the metallic oxides and is not "normal migration" of a chemical from the product. Therefore, it is recommended that the user only report an air release for ammonia emitted from ammoniacal copper zinc arsenate (ACZA) while in the storage yard.

The factor which estimates the release of ammonia from material treated with ACZA is 0.132 pounds of ammonia per cubic foot of material treated with ACZA. An example calculation is presented in Exhibit C1 of this guide.

Releases of pentachlorophenol from penta-treated material and creosote from creo-treated material held in storage for long periods of time need not be considered in the release estimates. In the 1990 reporting package (page 22), EPA states:

"You are not required to count as a release quantities of a toxic chemical that are lost due to . . . normal migration of a chemical from a product."

This Guidance Document draws a distinction between releases which are related to the freshly treated state of material as compared to releases which are from the product when it is in its final form and ready for use.

Emission Estimation/Non-point Air Sources: Retort Door Opening

The factors presented may be used to estimate the emissions of 313 chemicals due to the changing of charges and the consequent opening of the retort door. The factors are based on:

1. The total number of charges (cycles) run in the reporting year;
2. The average charge volume;
3. Total retort volume;
4. Retort temperature when the door is opened; and
5. The concentration of the 313 chemical in the LIQUID solution.

These emissions are assumed to be negligible for arsenical treatments with the exception of ammonia from ACZA treatments.

The variables for this estimate are defined as follows:

Q^* = factor which depends on temperature and chemical (see below)

V = the annual volume of saturated air released (cubic feet)
= (retort volume - ave. charge volume) x annual number of charges

x = weight fraction of the 313 chemical (lbs 313 chemical lbs solution)

Q = the annual amount of the 313 chemical released (lbs/year)
$= Q^* V_x$ (1)

Q^* factors are tabulated by 313 chemical and temperature and are presented in Exhibit D1. Centigrade temperatures are used. Centigrade temperature may be converted to Fahrenheit temperature by the formula:

$$F = (C \times 1.8) + 32. \quad (2)$$

Example calculations are presented in Exhibits D2 and D4 of this guide. Estimated releases are reported under Section 5.1 of Part III of Form R.

Emission Estimation/Point Air Sources: Tank Venting

Any time a solution storage tank is filled with liquid, a corresponding volume of vapor is displaced. Excepting cases where specific controls are used, this displaced volume must be counted as a release to the atmosphere from a "point source," namely the tank vent.

The same factors used to estimate releases to the air from opening the retort door may be used to estimate the releases from tank vents. These are the Q^* factors presented in Table Exhibit D1. The information needed to estimate air emissions using these factors is:

1. An estimate of the total volume released in the reporting year;
2. An estimate of the tank temperature; and
3. The concentration of the chemical in the liquid.

These factors, when multiplied together will give an estimate of the pounds of that chemical release to the air in the reporting year via tank vents.

Releases from CCA solutions are believed to be insignificant and only ammonia releases should be considered for ACZA solutions.

The volume released from tank vents will come from two sources:

1. New solution pumped into storage tanks; and
2. The transfer of solution back to the work tanks from the retort.

The latter source may be minimized by the use of equalization lines which allow the exchange of vapor between the retort and the work tank when transferring treating solution between the two. If these lines are in use, an efficiency of 90% should be used when estimating releases from this source, i.e., the calculated release due to solution transfer would be multiplied by 0.1. An example calculation is provided in Exhibit E1.

Also, ACZA treating systems typically have water scrubbers on tank vents to minimize the release of ammonia from transfer and receiving operations. These water scrubbers should be

assumed to be 99% efficient with respect to scrubbing ammonia from air displaced from the tanks. If these scrubbers are in place, the release calculated for both solution transfer and receiving operations would be reduced by 99%. Note that if the ACZA system has both a scrubber and equalization lines, the release due to solution transfer is calculated, reduced by 90% to account for the equalization lines, and added to the release calculated for solution receiving. Finally, the total is reduced by 99% to account for the scrubber (see example calculation in Exhibit E3).

If other control devices are used at your facility, it is suggested that you follow a similar approach by calculating the release without the control device and then estimating an efficiency for the device.

Q* factors are tabulated by 313 chemical and temperature and are presented in Exhibit D1. Centigrade temperatures are used. Centigrade temperature may be converted to Fahrenheit temperature by the following equation:

$$F = (C \times 1.8) + 32.$$

This source is reported under Section 5.2 of Part III of Form R. Example calculations are presented in Exhibits E1 through E3 of this guide.

Emission Estimation/Point Air Sources: Vacuum System Exhaust

The exhaust from the vacuum system will be saturated with treating chemicals when the vacuum is pulled after treating solution has been introduced into the cycle. Therefore, final vacuums and vacuums pulled during Boulton cycles will contribute to air releases and should be included in the 313 estimate.

The Q* factors (shown in Exhibit D1) may be used to estimate the release. However, you still must estimate the flow rate through the vacuum pump or steam ejector. If no other data are available, it is suggested that you use a constant flow rate of 200 cu. ft. per minute.

The emission rate, Q in pounds released per year, is equal to Q* multiplied by x, the liquid weight fraction of the 313 chemical, and V, the volume released in cu. ft.

These releases are assumed to be insignificant for arsenical solutions with the exemption of ammonia from ACZA. Example calculations are presented in Exhibits F1, F2, and F3.

Estimated releases should be included with other point source air emissions in Section 5.2 of Part III of Form R. The basis for the estimate should be shown as "O" unless specific emission data are used.

Emission Estimation/Point Air Sources:

CCA Components from Dry Kilns

Small quantities of metal oxides can be released during the kiln drying of CCA treated material. If actual monitoring data are available, it should be used to estimate annual emissions. However, if no such data are available, the figures given in Exhibit G1 may be used. Keep in mind that these numbers apply only to kiln drying of treated material. There are no emissions of treating chemicals during the kiln drying of material prior to treatment.

The following numbers are based on a paper presented to the American Wood-Preservers' Association (AWPA) in 1984 by Williams and Bridges of Koppers Co., Inc. They assume the following:

1. Approximately 90,000 bf per kiln charge;
2. A drying time of approximately 40 hours; and
3. Total vapor emission of 70,000 pounds.

An example calculation for 100 kiln charges run during the year (or approximately 9 MM bf) is presented in Exhibit G2.

Your calculated values will depend on the actual number of kiln charges run in the reporting year. The calculated emissions of metal are reported as point source air emissions.

Emission Estimation: Off-site Transfer to

POTW and Waste Disposal Facilities

In addition to releases to the environment, 313 also requires you to estimate off-site discharges to POTWs and waste disposal facilities. This should not present a problem as the information on the quantity and concentration of material sent to these destinations is usually readily available. Source documents include waste manifests, waste profiles, and POTW discharge records.

Release estimates can be obtained by simply multiplying the total quantity (in pounds) sent to either the POTW or the waste disposal facility by the appropriate weight percent. Information on the off-site facilities which received your material is entered in Part II of Form R. The estimated amount transferred to the off-site facility is entered in Section 6 of Part III.

Example calculations for both POTW discharges and waste disposal facilities are presented in Exhibit H1. Only pentachlorophenol is referred to in the example, but the approach is identical for creosote and arsenicals.

Emission Estimation: Storage Yard Incidental Loss

Releases of reportable chemicals due to the incidental loss of preservative from treated material stored on-site should not be considered a "release" for the purposes of 313 reporting. EPA's position in this matter is clearly stated in the 1990 Reporting Package (EPA 560/4-91-001, page 22-General). EPA states:

> *You are not required to count as a release quantities of a toxic chemical that are lost due to natural weathering of corrosion, normal/natural degradation of a product, or normal migration of a chemical from a product. For example, amounts of a covered toxic chemical that migrate from plastic products in storage do not have to be counted in estimates of releases of that chemical from the facility.*

Emission Estimation: Storage Yard Run-off

Yard run-off must be included in your estimate of "Discharges to receiving streams or water bodies" in Section 5.3 of Part III of Form R. The percent of this discharge due to site run-off must also be estimated. Because most treating plants operate with zero discharge of process water to surface water bodies, this will generally be 100%. If water is discharged directly, an estimate must be made as to the proportion of the total release of 313 chemical due to stormwater.

To estimate this release, both the concentration of the 313 chemical in the stormwater and the volume of stormwater discharge must be known. If no information on concentration is known, the Work Group suggests entering "NA" for "not applicable". [Note: "NA" is preferred to "N/A" or "ND" if no data/information are available.] However, if you have any data which suggest what the concentration may be, it must be used. The volume of stormwater may be estimated using the average rainfall for your area multiplied by the area covered by your plant and a run-off coefficient which will account for the infiltration of stormwater. Again data should be used if available.

Run-off coefficients are presented in Exhibit I1. Example calculations are presented in Exhibits I2 through I5.

Completing and Submitting Form R

A copy of a publication from EPA earlier this year is presented in Appendix 3. It contains the revised Form R for 1994 reporting, instructions for completing Form R, and both State and EPA contacts for submitting Form R.

The following points are intended to supplement those instructions:

1. Each chemical at each facility must have a separate Form R.

2. If more than one chemical must be reported by the facility, Sections I and II can be completed for one and duplicated for the rest.
3. Sections III and IV must be completed for each chemical which must be reported.
4. Section IV must be submitted even if it is blank.
5. Assemble and sign completed (Sections I, II, III, & IV) Form Rs for each chemical which must be reported.
6. Retain two copies of each Form R; one for your file and one for the plant.
7. Send the Form R with the original signature by July 1 to the EPA Section 313 Regional Contact for the region in which the facility is located and the State Designated Section 313 Contact for the State in which the facility is located.
8. Send reports to EPA by regular or certified mail to:

EPCRA Reporting Center
P.O. Box 3348
Merrifield, VA 22116-3348
Attn: Toxic Chemical Release Inventory

Overnight mail and hand-delivered submissions *only* should be addressed to:

EPCRA Reporting Center
c/o Computer Based Systems, Inc.
4301 N. Fairfax Drive
6th Floor, Suite 650
Arlington, VA 22203

9. EPA is encouraging electronic submittal of Form R Reports. The AWPI does not have any specific advice or instruction to add to EPA's instructions in the 1994 Reporting Package.

EPA requires that a copy of your Form R and all of the supporting information in the report be retained and available for inspection for three years after the date of submission.

Exhibits

Exhibit A1
Example Calculation

Threshold Determination for Creosote

(1) Determine amount processed

Beginning Inventory:	87,548 gal
Add Reporting Purchases:	221,987 gal
Subtract Ending Inventory:	59,367 gal
Total Processed:	250,168 gal

(2) Convert gallons to pounds

(250,168 gal) x (8.7 lb/gal) = 2,176,462 lbs

(3) Determine constituent pounds processed

[This is no longer applicable to creosote except for solutions of creosote and petroleum.]

(4) Compare with Threshold

The reporting year threshold for processed chemicals is 25,000 lbs. Consequently, this facility must complete a 313 emission report (Form R) for pentachlorophenol.

Exhibit A2
Example Calculation

Threshold Determination for Penta

(1) Determine amount processed

Beginning Inventory:	22,000 lbs
Add Reporting Year Purchases:	162,300 lbs
Subtract Ending Inventory:	48,560 lbs
Total Processed:	135,740 lbs

(2) Convert gallons to pounds

NOT APPLICABLE

(3) Determine constituent pounds processed

NOT APPLICABLE

(4) Compare with Threshold

The reporting year threshold for processed chemicals is 25,000 lbs. Consequently, this facility must complete a 313 emission report (Form R) for pentachlorophenol.

Exhibit A3
Example Calculation

Threshold Determination for CCA

(1) Determine amount processed

Beginning Inventory:	36,000 lbs
Add Reporting Year Purchases:	300,000 lbs
Subtract Ending Inventory:	18,000 lbs
Total Processed:	318,000 lbs

(2) Convert gallons to pounds

NOT APPLICABLE

(3) Determine constituent pounds processed

313 Chemical	Weight % In CCA	Lbs. Processed
Chromium Oxide	47.5	146,775
Copper Oxide	18.5	57,165
Arsenic Pentoxide	34.0	105,060

(4) Compare with threshold

The reporting year threshold for processed chemicals is 25,000 lbs. Consequently, this facility must complete a 313 emission report (Form R) for all chromium compounds, copper compounds, and arsenic compounds.

[Note to arsenical treaters: While the threshold calculations which determine which chemicals must be reported are based on the weight of the compound (i.e., arsenic pentoxide), the actual emission estimates for Form R are based on the weight of the metal released and not the compound (i.e., arsenic and not arsenic pentoxide).

Exhibit A4
Example Calculation

Threshold Determination for ACZA

(1) Determine amount processed

Beginning Inventory:	63,214 lbs
Reporting Year Purchases:	267,215 lbs
Ending Inventory:	23,812 lbs
Total Processed:	306,617 lbs

(2) Convert gallons to pounds

NOT APPLICABLE

(3) Determine constituent pounds processed

313 Chemical	Weight % In CCA	Lbs. Processed
Zinc Oxide	25	76,654
Copper Oxide	50	153,309
Arsenic Pentoxide	25	76,654

(4) Compare with threshold

The reporting year threshold for processed chemicals is 25,000 lbs. Consequently, this facility must complete a 313 emission report (Form R) for all zinc compounds, copper compounds, and arsenic compounds.

[Note to arsenical treaters: While the threshold calculations which determine which chemicals must be reported are based on the weight of the compound (i.e., arsenic pentoxide), the actual emission estimates for Form R are based on the weight of the metal released and not the compound weight (i.e., arsenic and not arsenic pentoxide).

Exhibit B1
SOCMI Factors and Adjusted Emission Factors

FUGITIVE SOURCE	EMISSION FACTOR (lbs/hr)		
Component / Fluid	SOCMI Factor	Creosote SOCMI+10	Penta SOCMI+100
Pump Seals:			
• light liquids	1.1E-01	1.1E-02	1.1E-03
• heavy liquids	4.7E-02	4.7E-03	4.7E-04
Valves (in-line):			
• gas	1.2E-02	1.2E-03	1.2E-04
• light liquids	1.6E-02	1.6E-03	1.6E-04
• heavy liquids	5.1E-04	5.1E-05	5.1E-06
Safety Relief Valves:			
• gas	2.3E-01	2.3E-02	2.3E-03
Open-end Lines:			
• gas	3.7E-03	3.7E-04	3.7E-05
• light liquids	3.7E-03	3.7E-04	3.7E-05
• heavy liquids	3.7E-03	3.7E-04	3.7E-05
Flanges:			
• gas	1.8E-03	1.8E-04	1.8E-05
• light liquids	1.8E-03	1.8E-04	1.8E-05
• heavy liquids	1.8E-03	1.8E-04	1.8E-05
Sample Connections:			
• gas	3.3E-02	3.3E-03	3.3E-04
• light liquids	3.3E-02	3.3E-03	3.3E-04
• heavy liquids	3.3E-02	3.3E-03	3.3E-04
Compressor Seals:			
• gas	5.0E-01	5.0E-02	5.0E-03

NOTE: "Light liquids" are defined as having a vapor pressure greater than 0.1 psia at 100°F.

Exhibit B2
Vapor Weight Fractions Factors SARA 313 Reporting

CHEMICAL NAME	Y* (20 °C)	Y* (30 °C)	Y* (40 °C)	Y* (50 °C)	Y* (60 °C)	Y* (70 °C)	Y* (80 °C)	Y* (90 °C)	Y* (100 °C)	Y* (110 °C)	Y* (120 °C)
pentachlorophenol	2.87E-08	8.23E-08	2.21E-07	5.58E-07	1.33E-06	3.02E-06	6.55E-06	1.36E-05	2.71E-05	5.22E-05	9.73E-05
ammonia	1.42E+01	1.95E+01	2.62E+01	3.46E+01	4.49E+01	5.74E+01	7.24E+01	9.02E+01	1.11E+02	1.35E+02	1.63E+02
ammonia * (for aqueous solutions)	2.33E-01	3.35E-01	4.71E-01	6.48E-01	8.75E-01	1.16E+00	1.51E+00	1.95E+00	2.47E+00	3.10E+00	3.84E+00
creosote	2.88E-04	5.54E-04	1.02E-03	1.81E-03	3.09E-03	5.14E-03	8.28E-03	1.30E-02	2.00E-02	2.99E-02	4.40E-02

Y* will yield Y, the weight fraction of the 313 chemical in the vapor, when multiplied by x, the weight fraction of the 313 compound in the LIQUID solution.

Exhibit B3
Example Calculation

Fugitive Emission Estimate for Creosote

(1) Determine total hours.

Total number of creosote cycles in reporting year:	312 cycles
Average cycle time:	39.5 hrs/cycle
Total cycle hours for reporting year:	312 X 39.5 = 12,320 hrs.

(2) Count components.

Valves (liquid service):	43
Flanges (liquid service):	64
Pumps (liquid service):	4
Pressure Relief (vapor service):	4

(3) Apply creosote factors (SOCMI + 10, see Exhibit B1).

Component	Number	Hours	Factor	Release (lbs/yr)
Valves	43	12,320	5.1E-05	2.70E+1
Flanges	64	12,320	1.8E-04	1.42E+2
Pumps	4	12,320	4.7E-03	2.32E+2
Pressure relief	4	12,320	2.3E-02	1.13E+3

(4) Determine "x", the weight percent of the 313 chemical in the liquid stream.

x, creosote: 100%

[if creosote/petroleum mixture, then x is percent of creosote in mixture]

(5) Calculate "Y", the vapor mass fraction of the 313 chemical.

Y = Y* (see Exhibit B2) multiplied by x (the weight percent of the 313 chemical in the liquid stream)

Assume for this example that the vapor stream is at a temperature of 100 °C because Y* is temperature dependent. Then Y*, creosote = 2.00E-02

Y, creosote = 2.00E-02 X 100% = 2.00E-02

(6) Calculate release of creosote by component.

Component	Total Release	Composition Factor	313 Release
Valves	2.70E+1	1	2.70E+01
Flanges	1.42E+2	1	1.42E+02
Pumps	2.32E+2	1	2.32E+02
Pressure relief	1.13E+3	2.00E-02	2.26E+01

(7) Add component 313 releases.

2.70E+01 + 1.42E+02 + 2.32E+02 + 2.26E+01 = 4.24E+02 lbs. creosote

(8) Report.

This facility would report a release of 420 pounds of creosote to the air under 5.1, Part III of Form R.

[420 is 4.24E+02 rounded to two significant figures as required for SARA 313 reporting.]

Exhibit B4
Example Calculation

Fugitive Emission Estimate for Pentachlorophenol

(1) Determine total hours.

Total number of penta cycles in reporting year:	312 cycles
Average cycle time:	39.5 hrs/cycle
Total cycle hours for reporting year:	312 X 39.5 = 12,320 hrs.

(2) Count components.

Valves (liquid service):	43
Flanges (liquid service):	64
Pumps (liquid service):	4
Pressure Relief (vapor service):	4

(3) Apply factors (penta factors, SOCMI +100, see Exhibit B1).

Component	Number	Hours	Factor	Release (lbs/yr)
Valves	43	12,320	5.1E-06	2.70E+0
Flanges	64	12,320	1.8E-05	1.42E+1
Pumps	4	12,320	4.7E-04	2.32E+1
Pressure relief	4	12,320	2.3E-03	1.13E+
2				

(4) Determine "x", the weight percent of pentachlorophenol in the liquid stream.

x, pentachlorophenol: 5.2%

(5) Calculate Y, the vapor mass fraction of pentachlorophenol.

Y = Y* (see Exhibit B2) multiplied by x (the weight percent of pentachlorophenol in the liquid stream)

Assume for this example that the vapor stream is at a temperature of 100 °C because Y* is temperature dependent. Then Y*, pentachlorophenol = 2.71E-5

Y, pentachlorophenol = 2.71E-5 X 5.2E-2 = 1.41E-6

(6) Calculate release of pentachlorophenol by component.

Component	Total Release	Composition Factor	313 Release
Valves	2.70E+0	5.2E-2	1.40E-1
Flanges	1.42E+1	5.2E-2	7.38E-1
Pumps	2.32E+1	5.2E-2	1.21E+0
Pressure relief	1.13E+2	1.41E-6	1.59E-4

(7) Add component releases.

1.4E-1 + 7.38E-1 + 1.21E+0 + 1.59E-4 = 2.9E+0 lbs. pentachlorophenol

(8) Report

This facility would report a release of 2.1 pounds of pentachlorophenol to the air under 5.1, Part III of Form R.

[2.1 is 2.09E+0 rounded to two significant figures as required for SARA 313 reporting.]

Exhibit B5
Example Calculation

Fugitive Emission Estimate for ACZA

(1) Determine total hours.

Total number of ACZA cycles in reporting year:	312 cycles
Average cycle time:	39.5 hrs/cycle
Total cycle hours for reporting year:	312 X 39.5 = 12,320 hrs.

(2) Count components.

Valves (liquid service):	43
Flanges (liquid service):	4
Pumps (liquid service):	4
Pressure Relief (vapor service):	4

(3) Apply factors (ammonia factors, unadjusted SOCMI, see Exhibit B1).

Component	Number	Hours	Factor	Release (lbs/yr)
Valves	43	12,320	5.10E-4	2.70E+2
Flanges	64	12,320	1.80E-3	1.42E+3
Pumps	4	12,320	4.70E-2	2.32E+3
Pressure relief	4	12,320	2.30E-1	1.13E+4

(4) Determine "x", the weight percent of ammonia in the liquid stream.

x, ammonia: 3.2%

(5) Calculate Y, the vapor mass fraction of ammonia.

Y = Y* (see Exhibit B2) multiplied by x (the weight percent ammonia in the liquid stream)

Assume for this example that the vapor stream is at a temperature of 100 °C because Y* is temperature dependent. You will find two sets of values for Y* in Exhibit B2 for ammonia. The values for "ammonia*" should be used for aqueous solutions. Then Y*, ammonia = 2.47E+0

Y, ammonia = 2.47E+0 X 3.2E-2 = 7.90E-2

(6) Calculate release of ammonia by component.

Component	Total Release	Composition Factor	313 Release
Valves	2.70E+2	3.2E-2	8.64E+0
Flanges	1.42E+3	3.2E-2	4.54E+1
Pumps	2.32E+3	3.2E-2	7.42E+1
Pressure relief	1.13E+4	7.9E-2	8.93E+2

(7) Add component releases.

8.64E+0 + 4.54E+1 + 7.42E+1 + 8.93E+2 = 1.02E+3 lbs. ammonia

(8) Report.

This facility would report a release of 1,000 pounds of ammonia to the air under 5.1, Part III of Form R.

[1,000 is 1.02E+3 rounded to two significant figures as required for SARA 313 reporting.]

Exhibit B6
Worksheet Description

Worksheet for Estimation of Fugitive Emissions

PLANT: TOTAL HOURS: A
PROCESS: EMISSION (lbs/yr): L
CHEMICAL:

	Stage					Transfer	Boulton	Press	Vacuum	Component Totals (lbs/yr)
	% Total Time					B1	B2	B3	B4	
	Actual Time (hrs)					C1	C2	C3	C4	
LIQUID COMPONENT										
Type	Factor		Number							
Valve	D1	E1	E2	E3	E4	F1	F2	F3	F4	I1
Flange	D2	E5	E6	E7	E8	F5	F6	F7	F8	I2
Pump	D3	E9	E10	E11	E12	F9	F10	F11	F12	I3
GASEOUS COMPONENT										
Type	Factor		Number							
Valve	D4	E13	E14	E15	E16	F13	F14	F15	F16	I4
Flange	D5	E17	E18	E19	E20	F17	F18	F19	F20	I5
pr/vent	D6	E21	E22	E23	E24	F21	F22	F23	F24	I6
TOTALS										
Composition Factors						Liquid:	G	Gaseous:	H	
Stage Totals (lbs/yr)						J1	J2	J3	J4	
Total Release (lbs/yr)										K

Description Of The Use Of Fugitive Emission Worksheet

(1) Calculate and enter the total hours of cycle time for reporting year in A.
(2) Estimate the fraction of cycle time for each stage of the cycle and enter it in B1 through B4.
(3) Compute the total hours for each cycle by multiplying A by B1-B4 and entering values in C1-C4.
(4) Enter the appropriate fugitive emission factors in D1-D6 from Exhibit B1.
(5) For each component type and each cycle stage enter the appropriate number of component in E1-E24
(6) Calculate total releases for each component type and each cycle stage by multiplying the cycle stage hours (C) by the appropriate factor (D) and the appropriate number of components (E) and enter these values in F1-F24.
(7) Enter the mass fraction of the chemical for which the fugitive emission estimate is being made for both the liquid stream and the vapor stream in G and H respectively.
(8) Multiply the F values by the appropriate composition factors (G and H) to compute the totals I1-I4 and/or J1-J4.
(9) Add I1 through I4 or J1 through J4 to calculate the total release and enter this value in K.
(10) K, the estimated release of the chemical to the air via fugitive emissions from process components, can also be posted in L for convenience.

NOTE: This worksheet breaks the treating cycle into four stages. The number of stages and the stage descriptions will differ between plants and processes.

Exhibit B7
Example Calculation for Pentachlorophenol

Worksheet for Estimation of Fugitive Emissions

PLANT: Joe Wood Preserving TOTAL HOURS: 12,320
PROCESS: Penta-A EMISSION (lbs/yr): 4.45E-01
CHEMICAL: Pentachlorophenol

	Stage					Transfer	Boulton	Press	Vacuum	Component Totals (lbs/yr)
	% Total					3.3	73.4	10.8	12.5	
	Time Actual Time (hrs)					406.56	9042.88	1330.56	1540	
LIQUID COMPONENT										
Type	Factor		Number							
Valve	5.1E-06	13	14	12	12	2.7E-02	6.46E-01	8.14E-02	9.42E-02	4.4E-02
Flange	1.8E-05	3	9	9	8	2.20E-02	1.46E+00	2.16E-01	2.22E-01	1.00E-01
Pump	0.00047	1	1	1	1	1.91E-01	4.25E+00	6.25E-01	7.24E-01	3.01E-01
GASEOUS COMPONENT										
Type	Factor		Number							
Valve	5.1E-06	4	3	1	6	8.29E-03	1.38E-01	6.79E-03	4.71E-02	3.01E-10
Flange	1.8E-05	7	9	1	9	5.12E-02	1.46E+00	2.40E-02	2.49E-01	2.68E-09
pr/vent	2.3E-03	3	8	3	4	0E+00	0E+00	0E+00	0E+00	0E+00
TOTALS										
Composition Factors						Liquid:	5.20E-02	Gaseous:	1.50E-09	
Stage Totals (lbs/yr)						1.25E-02	3.31E-01	4.80E-02	5.41E-02	
Total Release (lbs/yr)										4.45E-01

Note: (1) Gaseous composition based on vapor mole fraction of 1E-6.

Exhibit B8
Blank Worksheet

Example Worksheet for Estimation of Fugitive Emissions

PLANT:
PROCESS:
CHEMICAL:

TOTAL HOURS:
EMISSION (lbs/yr):

	Stage % Total Time Actual Time (hrs)	Transfer	Boulton	Press	Vacuum	Component Totals (lbs/yr)
LIQUID COMPONENT						
Type	Factor	Number				
Valve						
Flange						
Pump						
GASEOUS COMPONENT						
Type	Factor	Number				
Valve						
Flange						
pr/vent						
TOTALS						
Composition Factors		Liquid:		Gaseous:		
Stage Totals (lbs/yr)						
Total Release (lbs/yr)						

Exhibit C1
Example Calculation

Non-Point Air Emissions of Ammonia from ACZA Materials

(1) Determine total cubic feet treated.

263,000 cu ft

(2) Apply factor to estimate pounds of ammonia released.

263,000 cu ft x 0.132 lbs/cu ft = 3.115E+4 lbs.

(3) Report

This facility would report a release to the air under 5.1, Part III of Form R of 31,000 pounds of ammonia.

[31,000 is 3.115E+4 rounded to two significant figures as required by SARA 313 reporting.]

Exhibit D1
Vapor Weight Fractions Factors

SARA 313 Reporting

CHEMICAL NAME	Q* (20 °C)	Q* (30 °C)	Q* (40 °C)	Q* (50 °C)	Q* (60 °C)	Q* (70 °C)	Q* (80 °C)	Q* (90 °C)	Q* (100 °C)	Q* (110 °C)	Q* (120 °C)
pentachlorophenol	1.94E-07	5.38E-07	1.40E-06	3.42E-06	7.92E-06	1.75E-05	3.67E-05	7.42E-05	1.44E-04	2.70E-04	4.91E-04
ammonia	3.93E-01	5.21E-01	6.78E-01	8.67E-01	1.09E+00	1.36E+00	1.66E+00	2.01E+00	2.41E+00	2.86E+00	3.36E+00
ammonia * (for aqueous solutions)	6.42E-03	8.93E-03	1.21E-02	1.62E-02	2.12E-02	2.73E-02	3.46E-02	4.33E-02	5.35E-02	6.53E-02	7.89E-02
creosote	7.95E-04	1.48E-03	2.63E-03	4.52E-03	7.50E-03	1.21E-02	1.89E-02	2.89E-02	4.32E-02	6.31E-02	9.03E-02

Q* will yield Q, the annual release in pounds of vapor, when multiplied by V, the void volume released in cubic feet, and x, the weigh fraction of the 313 compound in the LIQUID solution.

Exhibit D2
Example Calculations

Air Emissions of Creosote from Retort Door Opening

(1) Determine the total released volume.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate release volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate total release volume for reporting year, V:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

(2) Determine liquid concentration of creosote and estimate the retort temperature when opened.

Solution Concentration, x:	100%
Retort Temperature:	90 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q* (creosote, 90 °C) = 2.89E-02

(4) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 2.89E\text{-}02 \times 1.045E+6 \times 1$$
$$= 3.02E+04 \text{ lbs/yr}$$

(5) Report

This facility would report a release of 30,000 pounds of creosote to the air under Section 5.1, Part III of Form R.

[Note that 3.02E+04 is rounded to two significant figures, *i.e.*, 30,000, as required for 313 reporting.]

Exhibit D3
Example Calculation

Air Emissions of Penta from Retort Door Opening

(1) Determine the total released volume.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate release volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate total release volume for reporting year, V:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

(2) Determine liquid concentration of pentachlorophenol in the treating solution and estimate the retort temperature when opened.

Solution Concentration, x:	5.2%
Tank Temperature:	90 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q* (pentachlorophenol, 90 °C) = 7.42E-05

(4) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 7.42E\text{-}05 \times 1.045E+6 \times .052$$
$$= 4.03 \text{ lbs/yr}$$

(5) Report.

This facility would report a release of 4.0 pounds of pentachlorophenol to the air under Section 5.1, Part III of Form R.

[Note that 4.03 is rounded to two significant figures, *i.e.*, 4.0, as required for 313 reporting.]

Exhibit D4
Example Calculation

Air Emissions of Ammonia (ACZA) from Retort Door Opening

(1) Determine the total released volume.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate release volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate total release volume for reporting year, V:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

(2) Determine liquid concentration of ammonia in the treating solution and estimate the retort temperature when opened.

Solution Concentration, x:	3.2%
Tank Temperature:	90 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q* (ammonia, 90 °C) = 4.33E-02

(4) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 4.33E\text{-}02 \times 1.045E+6 \times .032$$
$$= 1{,}448 \text{ lbs/yr}$$

(5) Report.

This facility would report a release of 1,400 pounds of ammonia to the air under Section 5.1, Part III of Form R.

[Note that 1,448 is rounded to two significant figures, *i.e.*, 1,400, as required for 313 reporting.]

Exhibit E1
Example Calculation

Air Emissions of Creosote from Tank Venting(Control: EQ Lines)

(1) Determine the total displaced volume due to solution transfer between the retort and the storage tank.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate release volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate total release volume for reporting year, Vt:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

Adjust Vt to account for 90% efficient equalization lines:

1.045E+6 cu ft x 0.10 = 1.045E+5 cu ft

(2) Determine the total displaced volume due to solution receiving.

Average Receiving Load Volume:	3,000 cu ft/load
Number Of Loads, Reporting Year:	28 loads

Calculate displaced volume due to receiving for reporting year, Vr:

3,000 cu ft/load x 28 loads = 8.400E+4

(3) Determine total displaced volume, V:

$$V = Vt + Vr$$
$$= 1.045E+5 + 8.400E+4$$
$$= 1.885E+5 \text{ cu ft}$$

(4) Determine liquid concentration of creosote in the treating solution and estimate the solution temperature in the tank.

Solution concentration, x:	100%
Tank temperature:	50 °C

(5) Obtain emission factor Q* from Exhibit D1.

Q*, creosote, 50 °C: 4.52E-03

(6) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 4.52E\text{-}03 \times 1.885E+5 \times 1$$
$$= 852 \text{ lbs/yr}$$

(7) Report.

This facility would report a release of 850 pounds of creosote to the air under Section 5.2, Part III of Form R.

[Note that 852 is rounded to two significant figures, *i.e.* 850, as required for 313 reporting.]

Exhibit E2
Example Calculation

Air Emissions of Penta from Tank Venting (No Controls)

(1) Determine the total displaced volume due to solution transfer between the retort and the storage tank.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate displaced volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate displaced volume due to transfer for reporting year, Vt:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

(2) Determine the total displaced volume due to solution receiving.

Average Receiving Load Volume:	3,000 cu ft/load
Number Of Loads, Reporting Year:	28 loads

Calculate displaced volume due to receiving for reporting year, Vr:

3,000 cu ft/load x 28 loads = 8.400E+4

(3) Determine total displaced volume, V:

$$V = V_t + V_r$$
$$= 1.045E+5 + 8.400E+4$$
$$= 1.129E+6 \text{ cu ft}$$

(4) Determine liquid concentration of pentachlorophenol in the treating solution and estimate the solution temperature in the tank.

Solution concentration, x:	5.2%
Tank temperature:	50 °C

(5) Obtain emission factor Q* from Exhibit D1.

Q*, pentachlorophenol, 50 °C:	3.42E-06

(6) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 3.42E\text{-}06 \times 1.129E+6 \times .052$$
$$= 0.2008 \text{ lbs/yr}$$

(7) Report.

This facility would report a release of 0.20 pounds of pentachlorophenol to the air under Section 5.2, Part III of Form R.

[Note that 0.2008 is rounded to two significant figures, *i.e.*, 0.20, as required for 313 reporting.]

Exhibit E3
Example Calculation

Air Emissions of Ammonia (ACZA) from Tank Venting (Control: Equalizer Lines and Ammonia Scrubber)

(1) Determine the total displaced volume due to solution transfer between the retort and the storage tank.

Average Charge Volume:	2,450 cu ft/charge
Retort Volume (empty):	6,250 cu ft/charge
Number Of Charges, Reporting Year:	275 charges

Calculate displaced volume per charge:

6,250 cu ft - 2,450 cu ft = 3,800 cu ft/charge

Calculate displaced volume due to transfer for reporting year, Vt:

3,800 cu ft/charge x 275 charges = 1.045E+6 cu ft

Adjust Vt to account for 90% efficient equalization lines:

1.045E+6 cu ft x 0.10 = 1.045E+5

(2) Determine the total displaced volume due to solution receiving.

Average Receiving Load Volume:	3,000 cu ft/load
Number Of Loads, Reporting Year:	28 loads

Calculate displaced volume due to receiving for reporting year, Vr:

3,000 cu ft/load x 28 loads = 8.400E+4

(3) Determine total displaced volume, V:

V = Vt + Vr
= 1.045E+5 + 8.400E+4
= 1.885E+5 cu ft

(4) Adjust V to account for 99% efficient ammonia scrubber.

1.885E+5 cu ft x 0.01 = 1.885E+3

(5) Determine liquid concentration of ammonia in the treating solution and estimate the solution temperature in the tank.

Solution concentration, x:	3.2%
Tank temperature:	50 °C

(6) Obtain emission factor Q* from Exhibit D1.

Q*, ammonia, 50 °C:	1.62E-02

(7) Calculate emission, Q, in pounds per year.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 1.62E\text{-}02 \times 1.885E+3 \times .035$$
$$= 1.069 \text{ lbs/yr}$$

(8) Report.

This facility would report a release of 1.1 pounds of ammonia to the air under Section 5.2, Part III of Form R.

[Note that 1.069 is rounded to two significant figures, *i.e.* 1.1, as required for 313 reporting.]

Exhibit F1
Example Calculation

Air Emissions of Creosote from Vacuum Exhaust

(1) Determine the total released volume, V.

Vacuum Flow Rate:	200 cu ft/ min
Average Vacuum Time Per Cycle:	3.5 hr/cycle
Annual Number Of Cycles:	280 cycles/hr

$$V = (200 \times 60) \times 3.5 \times 280 = 1.176E+7 \text{ cu ft/yr}$$

(2) Determine liquid concentration of creosote and estimate the vacuum exhaust temperature.

Solution Concentration, x:	100%
Exhaust temperature:	30 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q*, creosote, 30 °C:	1.48E-03

(4) Calculate emission, Q, in pounds per year for creosote.

$$Q = (Q^*) \times (V) \times (x)$$
$$= 1.48E-03 \times 1.176E+7 \times 1$$
$$= 1.74E+04 \text{ lbs/yr}$$

(5) Report.

This facility would report a release of 17,000 pounds of creosote to the air under Section 5.2, Part III of Form R.

[Note that 1.74E+04 is rounded to two significant figures, *i.e.* 17,000 as required for 313 reporting.]

Exhibit F2
Example Calculation

Air Emissions of Pentachlorophenol from Vacuum Exhaust

(1) Determine the total released volume, V.

Vacuum Flow Rate:	200 cu ft/ min
Average Vacuum Time Per Cycle:	3.5 hr/cycle
Annual Number Of Cycles:	280 cycles/hr

$V = (200 \times 60) \times 3.5 \times 280 = 1.176E+7$ cu ft/yr

(2) Determine liquid concentration of pentachlorophenol in solution and estimate the vacuum exhaust temperature.

Solution concentration, x:	5.2%
Exhaust temperature:	30 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q*, pentachlorophenol, 30 °C:	5.38E-07

(4) Calculate emission, Q, in pounds per year.

$Q = (Q^*) \times (V) \times (x)$
$= 5.38E-07 \times 1.176E+7 \times .052$
$= 0.329$ lbs/yr

(5) Report.

This facility would report a release of 0.33 pounds of pentachlorophenol to the air under Section 5.2, Part III of Form R.

[Note that 0.329 is rounded to two significant figures, i.e. 0.33, as required for 313 reporting.]

Exhibit F3
Example Calculation

Air Emissions of Ammonia (ACZA) from Vacuum Exhaust

(1) Determine the total released volume, V.

Vacuum Flow Rate:	200 cu ft/ min
Average Vacuum Time Per Cycle:	3.5 hr/cycle
Annual Number Of Cycles:	280 cycles/hr

V = (200 x 60) x 3.5 x 280 = 1.176E+7 cu ft/yr

(2) Determine liquid concentration of ammonia in the treating solution and estimate the vacuum exhaust temperature.

Solution concentration, x:	3.2%
Exhaust temperature:	30 °C

(3) Obtain emission factor Q* from Exhibit D1.

Q*, ammonia, 30 °C:	8.93E-03

(4) Calculate emission, Q, in pounds per year.

Q = (Q*) x (V) x (x)
= 8.93E-03 x 1.176E+7 x .032
= 3,361 lbs/yr

(5) Report.

This facility would report a release of 3,400 pounds of ammonia to the air under Section 5.2, Part III of Form R.

[Note that 3,361 is rounded to two significant figures, *i.e.* 3,400, as required for 313 reporting.]

Exhibit G1

CCA Emission Factor for Kiln-dried CCA-treated Wood [A]

METALLIC OXIDE	REPORTABLE METAL	METAL EMITTED (lbs/charge)
chromium oxide	chromium (Cr)	0.0007056
copper oxide	copper (Cu)	0.0020947
arsenic pentoxide	arsenic (As)	0.0003528

[A] Based on a paper presented to the American Wood Preservers Association (AWPA) in 1984 by Williams and Bridges of Koppers Co., Inc.

Exhibit G2
Sample Calculations

CCA-Emissions from Kilns Drying CCA-treated Wood

NUMBER OF KILN CHARGES IN 1988 (charges)	X	METAL RELEASED PER CHARGE (lbs/charge)	=	AMOUNT OF METAL EMITTED IN 1988 (lbs)
100	x	7.056E-4	=	0.07056 lbs Cr
100	x	2.095E-3	=	0.2095 lbs. Cu
100	x	3.528E-4	=	0.03528 lbs As

Exhibit H1
Example Calculation

Off-site Transfer Estimate for Pentachlorophenol
Publicly-owned Treatment Works and Waste-disposal Facilities

(1) Determine total pounds transferred off-site to publicly owned treatment works (POTWs) or waste disposal facilities (WDFs).

POTW

Hourly Rate of Discharge:	12 gallons per minute (GPM)
Estimate annual discharge:	12 GPM x 5.256E+5 + 5 min/yr = 6.307E+6 gallons
Convert to pounds:	6.307E+6 x 8.3 pounds/gallon = 5.235E+7 lbs

WDF

Number of containers shipped:	58
Pounds per container:	500
Calculate total pounds shipped:	58 x 500 = 2.900E+4 lbs

(2) Determine the weight percent of pentachlorophenol in the discharge.

POTW

Assume that pentachlorophenol is present at its solubility limit of 14 parts per million (ppm). [14 ppm is the solubility limit of pentachlorophenol at 20 degrees centigrade.]

WDF

The waste profile sheets that are required for shipment of waste to hazardous waste disposal facilities should be used to determine the weight percent of pentachlorophenol transferred to the WDF. For this example, assume 2.3% of the waste by weight.

(3) Calculate the pounds transferred off-site.

POTW

5.235E+7 x 1.4E-5 = 7.329E+2 lbs

WDF

2.900E+4 x 0.023 = 6.670E+2 lbs

(4) Report.

POTW

This facility would report a release of 730 pounds of pentachlorophenol to the POTW under 6.1.1, Part III of Form R.

[730 is 7.329E+2 rounded to two significant figures as required for SARA 313 reporting.]

WDF

This facility would report a release of 670 pounds of pentachlorophenol to the WDF under 6.2.1, Part III of Form R. If more than one WDF was used in 1990, they must be reported separately in Section 6.2.

[630 is 6.670E+2 rounded to two significant figures as required for SARA 313 reporting.]

Exhibit I1

Site Run-off Coefficients

The following factors account for the infiltration of stormwater for the calculation of run-off based on annual rainfall. The value for the total run-off, annual rainfall multiplied by plant area, should be multiplied by the weighted average run-off coefficient. These coefficients have been taken from the 1990 reporting package published by EPA for 313 reporting. When ranges were given, the average value is reported.

DESCRIPTION OF LAND AREA	RUN-OFF COEFFICIENT
Business:	
• Downtown areas	0.78
• Neighborhood areas	0.6
Industrial	
• Light areas	0.65
• Heavy areas	0.75
Railroad yard areas	0.30
Unimproved areas	0.20
Streets	
• Asphaltic	0.78
• Concrete	0.88
• Brick	0.78
Drives and walks	0.78
Roofs	0.85
Lawns: Sandy Soil	
• Flat, 2%	0.08
• Average, l 2-7%	0.13
• Steep, 7%	0.18
Lawns: Heavy Soil	
• Flat, 2%	0.15
• Average, l 2-7%	0.20
• Steep, 7%	0.30

Exhibit I2
Example Calculation

Yard Run-off Estimate for Creosote

(1) Estimate facility run-off coefficient.

Note: Only include areas which contribute to run-off and which may be contaminated with the chemical for which the release estimate is being made.

LAND USE	AREA (ACRES)	PERCENT AREA	RUN-OFF COEFFICIENT
unimproved	5.5	75.3	0.20
concrete	1.3	17.8	0.88
Asphaltic	0.5	6.9	0.83

Weighted average run-off coefficient, C*:

C* = (0.753)(0.20) + (0.178)(0.88) + (0.069)(0.83)
= 0.365 on a total area of 7.3 acres

(2) Estimate annual rainfall.

Average Annual Rainful (example only): 26 inches

(3) Calculate run-off volume, convert to pounds.

Run-off = (26 in) x (7.3 acres) x (0.083 ft/in) x (43,560 sq ft/acre)
= (6.86E+5 cu ft) x (7.48 gal/cu ft) x (8.3 lb/gal)
= (4.26E+7 lbs) x (run-off coef: 0.365)
= 1.56E+7 lbs

(4) Estimate the release of creosote.

Average concentration, total PAH (example only): 1.0 ppm

Estimated release = (1.56E+7) lbs x (1.0E-6)
= 15.6 lbs

(5) Report.

This facility would report a release of 16 lbs of creosote to the appropriate surface water body under Section 5.3 of Part III of Form R.

[16 is 15.6 rounded to two significant figures as required for 313 reporting.]

Special Note on Creosote Reporting

EPA has made it clear that if a facility has data on a specific creosote compound (eg, naphthalene), it does not accept the argument that there is no release on creosote, only a constituent compound and therefore the release of creosote is zero. As a minimum, the data on the creosote constituents must be totaled and treated as "creosote". Under no circumstances will creosote reporting be less than what the reporting would have been based on the constituents. The workgroup suggests that they will in fact always be higher.

Exhibit I3
Example Calculation

Yard Run-off Estimate for Pentachlorophenol

(1) Estimate facility run-off coefficient.

Note: Only include areas which contribute to run-off and which may be contaminated with the chemical for which the release estimate is being made.

LAND USE	AREA (ACRES)	PERCENT AREA	RUN-OFF COEFFICIENT
unimproved	5.5	75.3	0.20
concrete	1.3	17.8	0.88
asphaltic	0.5	6.9	0.83

Weighted average run-off coefficient, C*:

C* = (0.753)(0.20) + (0.178)(0.88) + (0.069)(0.83)
= 0.365 on a total area of 7.3 acres

(2) Estimate annual rainfall.

Average Annual Rainful (example only): 26 inches

(3) Calculate run-off volume, convert to pounds.

Run-off = (26 in) x (7.3 acres) x (0.083 ft/in) x (43,560 sq ft/acre)
= (6.86E+5 cu ft) x (7.48 gal/cu ft) x (8.3 lb/gal)
= (4.26E+7 lbs) x (run-off coef: 0.365)
= 1.56E+7 lbs

(4) Estimate the release of pentachlorophenol.

Average concentration (example only): 1.0 ppm

Estimated release = (1.56E+7) lbs x (1.0E-6)
= 15.6 lbs pentachlorophenol

(5) Report.

This facility would report a release of 16 lbs of pentachlorophenol to the appropriate surface water body under Section 5.3 of Part III of Form R.

[16 is 15.6 rounded to two significant figures as required for 313 reporting.]

Exhibit I4
Example Calculation

Yard Run-off Estimate for CCA

(1) Estimate facility run-off coefficient.

Note: Only include areas which contribute to run-off and which may be contaminated with the chemical for which the release estimate is being made.

LAND USE	AREA (ACRES)	PERCENT AREA	RUN-OFF COEFFICIENT
unimproved	5.5	75.3	0.20
concrete	1.3	17.8	0.88
asphaltic	0.5	6.9	0.83

Weighted average run-off coefficient, C*:

C* = (0.753)(0.20) + (0.178)(0.88) + (0.069)(0.83)
= 0.365 on a total area of 7.3 acres

(2) Estimate annual rainfall.

Average Annual Rainful (example only): 26 inches

(3) Calculate run-off volume, convert to pounds.

Run-off = (26 in) x (7.3 acres) x (0.083 ft/in) x (43,560 sq ft/acre)
= (6.86E+5 cu ft) x (7.48 gal/cu ft) x (8.3 lb/gal)
= (4.26E+7 lbs) x (run-off coef: 0.365)
= 1.56E+7 lbs

(4) Estimate the release of CCA constituents. [Assume for this example that chromium and arsenic must be reported.]

Chromium Average concentration, (example only): 0.01 ppm

Estimated release = (1.56E+7) lbs x (1.0E-8)
= 0.156 lbs Cr

Arsenic Average concentration, (example only): 0.01 ppm

Estimated release = (1.56E+7) lbs x (1.0E-8)
= 0.156 lbs As

(5) Report.

This facility would report a release of 0.16 lbs of both chromium and arsenic to the appropriate surface water body under Section 5.3 of Part III of Form R.

[0.16 is 0.156 rounded to two significant figures as required for 313 reporting.]

Special Note on Creosote Reporting

EPA has made it clear that if a facility has data on a specific creosote compound (eg, naphthalene), it does not accept the argument that there is no release on creosote, only a constituent compound and therefore the release of creosote is zero. As a minimum, the data on the creosote constituents must be totaled and treated as "creosote". Under no circumstances will creosote reporting be less than what the reporting would have been based on the constituents. The workgroup suggests that they will in fact always be higher.

Exhibit I5
Example Calculation

Yard Run-off Estimate for ACZA

(1) Estimate facility run-off coefficient.

Note: Only include areas which contribute to run-off and which may be contaminated with the chemical for which the release estimate is being made.

LAND USE	AREA (ACRES)	PERCENT AREA	RUN-OFF COEFFICIENT
unimproved	5.5	75.3	0.20
concrete	1.3	17.8	0.88
asphaltic	0.5	6.9	0.83

Weighted average run-off coefficient, C*:

C* = (0.753)(0.20) + (0.178)(0.88) + (0.069)(0.83)
= 0.365 on a total area of 7.3 acres

(2) Estimate annual rainfall.

Average Annual Rainful (example only): 26 inches

(3) Calculate run-off volume, convert to pounds.

Run-off = (26 in) x (7.3 acres) x (0.083 ft/in) x (43,560 sq ft/acre)
= (6.86E+5 cu ft) x (7.48 gal/cu ft) x (8.3 lb/gal)
= (4.26E+7 lbs) x (run-off coef: 0.365)
= 1.56E+7 lbs

(4) Estimate the release of ACZA constituents. [Assume for this example that copper, zinc, and arsenic must be reported.]

Copper Average concentration, (example only): 0.01 ppm

Estimated release = (1.56E+7) lbs x (1.0E-8)
= 0.156 lbs Cu

Zinc Average concentration, (example only): 0.01 ppm

Estimated release = (1.56E+7) lbs x (1.0E-8)
= 0.156 lbs Zn

Arsenic Average concentration, (example only): 0.01 ppm

Estimated release = (1.56E+7) lbs x (1.0E-8)
= 0.156 lbs As

(5) Report.

This facility would report a release of 0.16 lbs of copper, zinc, and arsenic to the appropriate surface water body under Section 5.3 of Part III of Form R.

[0.16 is 0.156 rounded to two significant figures as required for 313 reporting.]

Special Note on Creosote Reporting

EPA has made it clear that if a facility has data on a specific creosote compound (eg, naphthalene), it does not accept the argument that there is no release on creosote, only a constituent compound and therefore the release of creosote is zero. As a minimum, the data on the creosote constituents must be totaled and treated as "creosote". Under no circumstances will creosote reporting be less than what the reporting would have been based on the constituents. The workgroup suggests that they will in fact always be higher.

EXHIBIT AA1
CREOSOTE EMISSIONS SPREADSHEET

- Filename posted here -

Data Input Section			
Item		Input	Units
1. Facility ID:			
2. Date:			
3. Volume of Wood Treated:			(ft^3)
4. Volume of Wood per Charge:			(ft^3)
5. Retort Data –	length:		(ft)
	diameter:		(ft)
	number:		(No.)
6. Annual Creosote Purchases:			(gallons)
7. Avg. Creosote per Charge:			(gallons)
8. Charges During Reporting Year –	green:		(No.)
	dry:		(No.)
9. Wastewater –	flow:		(gpm)
Is the Wastewater considered	a Point Source?		('y' or 'n')
10. Storage Tanks –	capacity:		(gallons)
	number:		(No.)
	PVRVs?		('y' or 'n')
	Equal. Lines?		('y' or 'n')
11. Work Tanks –	capacity:		(gallons)
	number:		(No.)
	PVRVs?		('y' or 'n')
	Equal. Lines?		('y' or 'n')
12. Reuping Air Vented to Atmosphere?			('y' or 'n')
13. Steam Drying Used?			('y' or 'n')
	steam flow:		(gpm)
	dry cycle duration:		(hrs)
	dry cycles/year:		(cycles/yr)
14. Final Steam Flash Used?			('y' or 'n')
	steam flow:		(gpm)
	flash duration:		(hrs)
	flash cycles/year:		(cycles/yr)
15. Phase Separation Reclaim Tank?			('y' or 'n')
	capacity of tank:		(gallons)
volume of creosote processed	by the reclaim tank:		(gallons/yr)
16. Heated Dehydrator?			('y' or 'n')
volume of creosote processed	by the dehydrator:		(gallons/yr)
17. Fugitives –	sump tanks:		(No.)
	sap tanks:		(No.)
	valves:		(No.)
	flanges:		(No.)
time retort door	is open per cycle:		(hrs)

Creosote Emissions			
Point Sources		Fugitives	
Source	(lbs/yr)	Source	(lbs/yr)
Work Tanks	0.00	Sumps	0.00
Storage Tanks	0.00	Saps	0.00
Treating Cycle	0.00	Valves	0.00
Steam Drying Process	0.00	Flanges	0.00
Final Steam Flash Process	0.00	Retort Door	0.00
Reclaim Tank	0.00		
Dehydrator	0.00		
Wastewater	0.00	Wastewater	0.00
Total Emission (lbs/yr):	0.00		0.00
(tons/yr):	0.00		0.00

Exhibit AA2
Creosote Spreadsheet Emissions Equations

Control Device Factor

If no PVRV and no Eq. Line:	Control Device Factor = 5.0
If PVRV and no Eq. Line:	Control Device Factor = 1.0
If no PVRV and Eq. Line:	Control Device Factor = 2.5
If PVRV and Eq. Line:	Control Device Factor = 0.5

Source and Emission Equation

Work Tanks:

(Control Device Factor) * 68.8 lbs/yr * Work Tank Capacity/50000 gallons * Number of Work Tanks

Storage Tanks:

(Control Device Factor) * 38.3 lbs/yr * Storage Tank Capacity/100000 gallons * Number of Storage Tanks

Treating Cycle

(a) If vented to air:

Retort Volume * ((Green Charges * (0.1721/355.37 • @EXP(-6027.5809/355.37 + 18.209322)+0.0013762) • +(Dry Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37 + 18.209322)+0.0001242)

(b) If vented to work tank:

0.5 • Retort Volume • ((Green Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37 + 18.209322)+0.0013762) *)+(Dry Charges • (0.1721/355.37 • @EXP(-6027.5809/355.37 + 18.209322)+0.0001242)

Steam Drying Process:

0.534 lb/yr * Steam Flow Rate * Cycle Duration • Cycles Per Year

Final Steam Flash Process:

0.534 * lb/yr * Steam Flow Rate • Cycle Duration • Cycles Per Year

Reclaim Tank:

68.8 lbs/yr * Tank Capacity/50000 * 10

Dehydrator:

0.1246 lb/yr * Volume of Liquid sent to Dehydrator

Sumps:

0.07 * 0.1 * 8760 * Number of Sump Tanks

Saps:

0.07 * 0.1 * 8760 * Number of Sap Tanks

Valves:

0.00051 * 0.1 * 8760 * Number of Valves

Flanges:

0.0018 * 0.1 * 8760 * Number of Flanges

Retort Door:

5.917 * Number of Retort Chambers * Total Number of Charges For The Reporting Year * Time Retort Door Is Open Per Cycle * Volume of Retort Chamber/5773

Wastewater:

(a) If uncovered:

(100% / 42%) * Wastewater Flow * 1872.4/35

(b) If covered:

(100% / 42%) * Wastewater Flow * 266.4/35

EXHIBIT AB1
PCP EMISSIONS SPREADSHEET

- Filename posted here -

Data Input Section			
Item		Input	Units
1. Facility ID:			
2. Date:			
3. Volume of Wood Treated:			(ft^3)
4. Volume of Wood per Charge:			(ft^3)
5. Retort Data --	length:		(ft)
	diameter:		(ft)
	number:		(No.)
6. Annual Pentachlorophenol Purchases:			(gallons)
7. Avg. Pentachlorophenol per Charge:			(gallons)
8. Charges During Reporting Year --	green:		(No.)
	dry:		(No.)
9. Wastewater --	flow		(gpm)
Is the Wastewater considered	a Point Source?		('y' or 'n')
10. Storage Tanks --	capacity:		(gallons)
	number:		(No.)
	PVRVs?		('y' or 'n')
	Equal. Lines?		('y' or 'n')
11. Work Tanks --	capacity:		(gallons)
	number:		(No.)
	PVRVs?		('y' or 'n')
	Equal. Lines?		('y' or 'n')
12. Reuping Air Vented to Atmosphere?			('y' or 'n')
13. Steam Drying Used?			('y' or 'n')
	steam flow:		(gpm)
	dry cycle duration:		(hrs)
	dry cycles/year:		(cycles/yr)
14. Final Steam Flash Used?			('y' or 'n')
	steam flow:		(gpm)
	flash duration:		(hrs)
	flash cycles/year:		(cycles/yr)
15. Phase Separation Reclaim Tank?			('y' or 'n')
	capacity of tank?		(gallons)
volume of PCP processed by	the reclaim tank?		(gallons/yr)
16. Heated Dehydrator?			('y' or 'n')
volume of PCP processed by	the reclaim tank?		(gallons/yr)
17. Fugitives --	sump tanks?		(No.)
	sap tanks?		(No.)
	valves?		(No.)
	flanges?		(No.)
time retort door	is open per cycle		(hrs)

Pentachlorophenol Emissions			
Point Sources		Fugitives	
Source	(lbs/yr)	Source	(lbs/yr)
Work Tanks	0.00	Sumps	0.00
Storage Tanks	0.00	Saps	0.00
Treating Cycle	0.00	Valves	0.00
Steam Drying Process	0.00	Flanges	0.00
Final Steam Flash Process	0.00	Retort Door	0.00
Reclaim Tank	0.00		
Dehydrator	0.00		
Wastewater	0.00	Wastewater	0.00
Total Emission (lbs/yr):	0.00		0.00

Exhibit AB2
PCP Spreadsheet Emissions Equations

PCP Factors

Source	Assumed Temperature. (°C)	PCP/Creosote Factor
Work Tanks	82.2	0.00851
Storage Tanks	82.2	0.00851
Treating Cycle	82.2	0.00851
Steaming	82.2	0.00851
Flashing	82.2	0.00851
Reclaim Tank	82.2	0.00851
Dehydrator	100	0.01238
Wastewater	20	0.00116
Sumps	40	0.00248
Saps	40	0.00248
Pump Seals	60	0.00479
Valves	60	0.00479
Flanges	60	0.00479
Retort Door	82.2	0.00851

Control Device Factor

If no PVRV and no Eq. Line:	Control Device Factor = 5.0
If PVRV and no Eq. Line:	Control Device Factor = 1.0
If no PVRV and Eq. Line:	Control Device Factor = 2.5
If PVRV and Eq. Line:	Control Device Factor = 0.5

Source and Emission Equation

Work Tanks:

(PCP Factor) * (Control Device Factor) * Number of Work Tanks * 68.8 lbs/yr * (Work Tank Capacity/50000 gallons)

Storage Tanks:

(PCP Factor) * (Control Device Factor) * 38.3 lbs/yr * Storage Tank Capacity/100000 gallons * Number of Storage Tanks

Treating Cycle:

(a) If vented to air:

(PCP Factor) * Retort Volume * ((Green Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37 + 18.209322)+0.0013762) * +(Dry Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37+18.209322)+0.0001242)

(b) If vented to work tank:

(PCP Factor) * 0.5 * Retort Volume * ((Green Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37 + 18.209322)+0.0013762) *)+(Dry Charges * (0.1721/355.37 * @EXP(-6027.5809/355.37 + 18.209322)+0.0001242)

Steam Drying Process:

(PCP Factor) * 0.534 lb/yr * Steam Flow Rate * Cycle Duration * Cycles Per Year

Final Steam Flash Process:

(PCP Factor) * 0.534 * lb/yr * Steam Flow Rate * Cycle Duration * Cycles Per Year

Reclaim Tank:

(PCP Factor) * 68.8 lbs/yr * Tank Capacity/50000 * 10

Dehydrator:

(PCP Factor) * 0.1246 lb/yr * Volume of Liquid sent to Dehydrator

Sumps:

(PCP Factor) * 0.07 * 0.1 * 8760 * Number of Sump Tanks

Saps:

(PCP Factor) * 0.07 * 0.1 * 8760 * Number of Sap Tanks

Valves:

(PCP Factor) * 0.00051 * 0.1 * 8760 * Number of Valves

Flanges:

(PCP Factor) * 0.0018 * 0.1 * 8760 * Number of Flanges

Retort Door:

(PCP Factor) * 5.917 * Number of Retort Chambers * Total Number of Charges For The Reporting Year * Time Retort Door Is Open Per Cycle * Volume of Retort Chamber/5773

Wastewater:

(a) If uncovered:

(PCP Factor) * (100%/42%) * Wastewater Flow * 1872.4/35

(b) If covered:

(PCP Factor) * (100%/42%) * Wastewater Flow * 266.4/35

Appendix 1

Section 313 Toxic Chemical List for Reporting Year 1994

(Source: Table II, *Toxic Chemical Release Inventory Reporting Form R and Instruction*, EPA 745-K-95-051)

TABLE II. SECTION 313 TOXIC CHEMICAL LIST FOR REPORTING YEAR 1994 (including Toxic Chemical Categories)

Specific toxic chemicals with CAS Number are listed in alphabetical order on the next page. A list of the same chemicals in CAS Number order begins at the end of the alphabetical list of toxic chemicals. Covered toxic chemical categories follow.

Certain toxic chemicals listed in Table II have parenthetic "qualifiers." These qualifiers indicate that these toxic chemicals are subject to the section 313 reporting requirements if manufactured, processed, or otherwise used in a specific form. The following chemicals are reportable only if they are manufactured, processed, or otherwise used in the specific form(s) listed below:

Chemical	CAS Number	Qualifier
Aluminum (fume or dust)	7429-90-5	Only if it is in a fume or dust form.
Aluminum oxide (fibrous forms)	1344-28-1	Only if it is a fibrous form.
Ammonium nitrate (solution)	6484-52-2	Only if it is in a solution.
Ammonium sulfate (solution)	7783-20-2	Only if it is in a solution.
Asbestos (friable)	1332-21-4	Only if it is a friable form.
Phosphorus (yellow or white)	7723-14-0	Only if it is a yellow or white form.
Vanadium (fume or dust)	7440-62-2	Only if it is in a fume or dust form.
Zinc (fume or dust)	7440-66-6	Only if it is in a fume or dust form.

The qualifier for the following two chemicals is based on the chemical activity rather than the form of the chemical. These chemicals are subject to EPCRA section 313 reporting requirements only when the indicated activity is performed.

Chemical	CAS Number	Qualifier
Isopropyl alcohol (manufacturing - strong acid process, no supplier notification)	67-63-0	Only if it is being manufactured by the strong acid process.
Saccharin (manufacturing, no supplier notification).	81-07-2	Only if it is being manufactured.

There are no supplier notification requirements for isopropyl alcohol and saccharin since processors and users of these chemicals are not required to report. Manufacturers of these chemicals do not need to notify their customers that these are reportable TRI chemicals.

[Note: Chemicals may be added to or deleted from the list. The Emergency Planning and Community Right-to-Know Information Hotline, (800) 535-0202 or (703) 412-9877, will provide up-to-date information on the status of these changes. See Section B.4.b of the instructions for more information on the de minimis values listed below.]

*C.I. means "Color Index"

a. Alphabetical Chemical List

CAS Number	Toxic Chemical Name	De Minimis Concentration
75-07-0	Acetaldehyde	0.1
60-35-5	Acetamide	0.1
67-64-1	Acetone	1.0
75-05-8	Acetonitrile	1.0
98-86-2	Acetophenone	1.0
53-96-3	2-Acetylaminofluorene	0.1
107-02-8	Acrolein	1.0
79-06-1	Acrylamide	0.1
79-10-7	Acrylic acid	1.0
107-13-1	Acrylonitrile	0.1
309-00-2	Aldrin {1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a, 5,8,8a-hexahydro-(1.alpha., 4.alpha.,4a.beta.,5.alpha., 8.alpha.,8a.beta.)-}	1.0
107-18-6	Allyl alcohol	1.0
107-05-1	Allyl chloride	1.0
7429-90-5	Aluminum (fume or dust)	1.0
1344-28-1	Aluminum oxide (fibrous forms)	0.1
117-79-3	2-Aminoanthraquinone	0.1
60-09-3	4-Aminoazobenzene	0.1
92-67-1	4-Aminobiphenyl	0.1
82-28-0	1-Amino-2-methylanthraquinone	0.1
61-82-5	Amitrole	0.1
7664-41-7	Ammonia	1.0
6484-52-2	Ammonium nitrate (solution)	1.0
7783-20-2	Ammonium sulfate (solution)	1.0
62-53-3	Aniline	1.0
90-04-0	o-Anisidine	0.1
104-94-9	p-Anisidine	1.0
134-29-2	o-Anisidine hydrochloride	0.1
120-12-7	Anthracene	1.0
7440-36-0	Antimony	1.0
7440-38-2	Arsenic	0.1
1332-21-4	Asbestos (friable)	0.1
7440-39-3	Barium	1.0
98-87-3	Benzal chloride	1.0
55-21-0	Benzamide	1.0
71-43-2	Benzene	0.1
92-87-5	Benzidine	0.1
98-07-7	Benzoic trichloride {Benzotrichloride}	0.1
98-88-4	Benzoyl chloride	1.0
94-36-0	Benzoyl peroxide	1.0
100-44-7	Benzyl chloride	1.0
7440-41-7	Beryllium	0.1
92-52-4	Biphenyl	1.0
111-91-1	Bis(2-chloroethoxy)methane	1.0
111-44-4	Bis(2-chloroethyl) ether	1.0
542-88-1	Bis(chloromethyl) ether	0.1
108-60-1	Bis(2-chloro-1-methylethyl) ether	1.0
103-23-1	Bis(2-ethylhexyl) adipate	1.0
353-59-3	Bromochlorodifluoromethane {Halon 1211}	1.0
75-25-2	Bromoform {Tribromomethane}	1.0
74-83-9	Bromomethane {Methyl bromide}	1.0
75-63-8	Bromotrifluoromethane {Halon 1301}	1.0
106-99-0	1,3-Butadiene	0.1
141-32-2	Butyl acrylate	1.0
71-36-3	n-Butyl alcohol	1.0
78-92-2	sec-Butyl alcohol	1.0
75-65-0	tert-Butyl alcohol	1.0
106-88-7	1,2-Butylene oxide	1.0
123-72-8	Butyraldehyde	1.0
4680-78-8	C.I. Acid Green 3*	1.0
569-64-2	C.I. Basic Green 4*	1.0
989-38-8	C.I. Basic Red 1*	1.0
1937-37-7	C.I. Direct Black 38*	0.1
2602-46-2	C.I. Direct Blue 6*	0.1
16071-86-6	C.I. Direct Brown 95*	0.1
2832-40-8	C.I. Disperse Yellow 3*	1.0
3761-53-3	C.I. Food Red 5*	0.1
81-88-9	C.I. Food Red 15*	0.1
3118-97-6	C.I. Solvent Orange 7*	1.0
97-56-3	C.I. Solvent Yellow 3*	0.1
842-07-9	C.I. Solvent Yellow 14*	0.1
492-80-8	C.I. Solvent Yellow 34* {Aurimine}	0.1
128-66-5	C.I. Vat Yellow 4*	1.0
7440-43-9	Cadmium	0.1
156-62-7	Calcium cyanamide	1.0
133-06-2	Captan {1H-Isoindole-1,3(2H)-dione, 3a,4,7,7a-tetrahydro-2-[(trichloromethyl)thio]-}	1.0
63-25-2	Carbaryl {1-Naphthalenol, methylcarbamate}	1.0
75-15-0	Carbon disulfide	1.0
56-23-5	Carbon tetrachloride	0.1
463-58-1	Carbonyl sulfide	1.0
120-80-9	Catechol	1.0
133-90-4	Chloramben {Benzoic acid, 3-amino-2,5-dichloro-}	1.0

*C.I. means "Color Index"

CAS Number	Toxic Chemical Name	De Minimis Concentration
57-74-9	Chlordane {4,7-Methanoindan, 1,2,4,5,6,7, 8,8-octachloro-2,3,3a,4, 7,7a-hexahydro-}	1.0
7782-50-5	Chlorine	1.0
10049-04-4	Chlorine dioxide	1.0
79-11-8	Chloroacetic acid	1.0
532-27-4	2-Chloroacetophenone	1.0
108-90-7	Chlorobenzene	1.0
510-15-6	Chlorobenzilate {Benzeneacetic acid,4-chloro- .alpha.-(4-chlorophenyl)- .alpha.-hydroxy-,ethyl ester}	1.0
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	1.0
75-45-6	Chlorodifluoromethane (HCFC-22)	1.0
75-00-3	Chloroethane {Ethyl chloride}	1.0
67-66-3	Chloroform	0.1
74-87-3	Chloromethane {Methyl chloride}	1.0
107-30-2	Chloromethyl methyl ether	0.1
126-99-8	Chloroprene	1.0
63938-10-3	Chlorotetrafluoroethane	1.0
354-25-6	1-Chloro-1,1,2,2-tetrafluoro-ethane (HCFC-124a)	1.0
2837-89-0	2-Chloro-1,1,1,2-tetrafluoro-ethane (HCFC-124)	1.0
1897-45-6	Chlorothalonil {1,3-Benzenedicarbonitrile, 2,4,5,6-tetrachloro-}	1.0
7440-47-3	Chromium	0.1
7440-48-4	Cobalt	1.0
7440-50-8	Copper	1.0
8001-58-9	Creosote	0.1
120-71-8	p-Cresidine	0.1
1319-77-3	Cresol (mixed isomers)	1.0
108-39-4	m-Cresol	1.0
95-48-7	o-Cresol	1.0
106-44-5	p-Cresol	1.0
98-82-8	Cumene	1.0
80-15-9	Cumene hydroperoxide	1.0
135-20-6	Cupferron {Benzeneamine, N-hydroxy- N-nitroso, ammonium salt}	0.1
110-82-7	Cyclohexane	1.0
94-75-7	2,4-D {Acetic acid, (2,4-dichlorophenoxy)-}	1.0
764-41-0	1,4-Dichloro-2-butene	1.0
1163-19-5	Decabromodiphenyl oxide	1.0
2303-16-4	Diallate {Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester}	1.0
615-05-4	2,4-Diaminoanisole	0.1
39156-41-7	2,4-Diaminoanisole sulfate	0.1
101-80-4	4,4'-Diaminodiphenyl ether	0.1
25376-45-8	Diaminotoluene (mixed isomers)	0.1
95-80-7	2,4-Diaminotoluene	0.1
334-88-3	Diazomethane	1.0
132-64-9	Dibenzofuran	1.0
96-12-8	1,2-Dibromo-3-chloropropane {DBCP}	0.1
106-93-4	1,2-Dibromoethane {Ethylene dibromide}	0.1
124-73-2	Dibromotetrafluoroethane {Halon 2402}	1.0
84-74-2	Dibutyl phthalate	1.0
25321-22-6	Dichlorobenzene (mixed isomers)	0.1
95-50-1	1,2-Dichlorobenzene	1.0
541-73-1	1,3-Dichlorobenzene	1.0
106-46-7	1,4-Dichlorobenzene	0.1
91-94-1	3,3'-Dichlorobenzidine	0.1
75-27-4	Dichlorobromomethane	1.0
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC-141b)	1.0
34077-87-7	Dichlorotrifluoroethane	1.0
75-71-8	Dichlorodifluoromethane (CFC-12)	1.0
107-06-2	1,2-Dichloroethane {Ethylene dichloride}	0.1
540-59-0	1,2-Dichloroethylene	1.0
75-09-2	Dichloromethane {Methylene chloride}	0.1
120-83-2	2,4-Dichlorophenol	1.0
78-87-5	1,2-Dichloropropane	1.0
78-88-6	2,3-Dichloropropene	1.0
542-75-6	1,3-Dichloropropylene	0.1
90454-18-5	Dichloro-1,1,2-trifluoroethane	1.0
76-14-2	Dichlorotetrafluoroethane (CFC-114)	1.0
812-04-4	1,1-Dichloro-1,1,2-trifluoro-ethane (HCFC-123b)	1.0
354-23-4	1,2-Dichloro-1,1,2-trifluoro-ethane (HCFC-123a)	1.0

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CAS Number	Toxic Chemical Name	De Minimis Concentration
306-83-2	2,2-Dichloro-1,1,1-trifluoro-ethane (HCFC-123)	1.0
62-73-7	Dichlorvos {Phosphoric acid, 2,2-dichloroethenyl dimethyl ester}	1.0
115-32-2	Dicofol {Benzenemethanol, 4-chloro-.alpha.-(4-chlorophenyl)-.alpha.- (trichloromethyl)-}	1.0
1464-53-5	Diepoxybutane	0.1
111-42-2	Diethanolamine	1.0
117-81-7	Di-(2-ethylhexyl) phthalate {DEHP}	0.1
84-66-2	Diethyl phthalate	1.0
64-67-5	Diethyl sulfate	0.1
94-58-6	Dihydrosafrole	0.1
119-90-4	3,3'-Dimethoxybenzidine	0.1
60-11-7	4-Dimethylaminoazobenzene	0.1
119-93-7	3,3'-Dimethylbenzidine {o-Tolidine}	0.1
79-44-7	Dimethylcarbamyl chloride	0.1
57-14-7	1,1-Dimethyl hydrazine	0.1
105-67-9	2,4-Dimethylphenol	1.0
131-11-3	Dimethyl phthalate	1.0
77-78-1	Dimethyl sulfate	0.1
99-65-0	m-Dinitrobenzene	1.0
528-29-0	o-Dinitrobenzene	1.0
100-25-4	p-Dinitrobenzene	1.0
534-52-1	4,6-Dinitro-o-cresol	1.0
51-28-5	2,4-Dinitrophenol	1.0
121-14-2	2,4-Dinitrotoluene	1.0
606-20-2	2,6-Dinitrotoluene	1.0
25321-14-6	Dinitrotoluene (mixed isomers)	1.0
123-91-1	1,4-Dioxane	0.1
122-66-7	1,2-Diphenylhydrazine {Hydrazobenzene}	0.1
106-89-8	Epichlorohydrin	0.1
110-80-5	2-Ethoxyethanol	1.0
140-88-5	Ethyl acrylate	0.1
100-41-4	Ethylbenzene	1.0
541-41-3	Ethyl chloroformate	1.0
74-85-1	Ethylene	1.0
107-21-1	Ethylene glycol	1.0
151-56-4	Ethyleneimine {Aziridine}	0.1
75-21-8	Ethylene oxide	0.1
96-45-7	Ethylene thiourea	0.1
75-34-3	Ethylidene dichloride	1.0
2164-17-2	Fluometuron {Urea, N,N-dimethyl-N'-[3-(trifluoromethyl)phenyl]-}	1.0
50-00-0	Formaldehyde	0.1
64-18-6	Fromic Acid	1.0
76-13-1	Freon 113 {Ethane, 1,1,2-trichloro-1,2,2-trifluoro-}	1.0
76-44-8	Heptachlor {1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene}	1.0
118-74-1	Hexachlorobenzene	0.1
87-68-3	Hexachloro-1,3-butadiene	1.0
77-47-4	Hexachlorocyclopentadiene	1.0
67-72-1	Hexachloroethane	1.0
1335-87-1	Hexachloronaphthalene	1.0
70-30-4	Hexachlorophene	1.0
680-31-9	Hexamethylphosphoramide	0.1
302-01-2	Hydrazine	0.1
10034-93-2	Hydrazine sulfate	0.1
7647-01-0	Hydrochloric acid	1.0
74-90-8	Hydrogen cyanide	1.0
7664-39-3	Hydrogen fluoride	1.0
123-31-9	Hydroquinone	1.0
78-84-2	Isobutyraldehyde	1.0
67-63-0	Isopropyl alcohol (manufacturing-strong acid process, no supplier notification)	0.1
80-05-7	4,4'-Isopropylidenediphenol	1.0
120-58-1	Isosafrole	1.0
7439-92-1	Lead	0.1
58-89-9	Lindane {Cyclohexane,1,2,3,4,5,6-hexachloro-,(1.alpha.,2.alpha.,3.beta.,4.alpha.,5.alpha.,6.beta.)-}	0.1
108-31-6	Maleic anhydride	1.0
109-77-3	Malononitrile	1.0
12427-38-2	Maneb {Carbamodithioic acid, 1,2-ethanediylbis-,manganese complex}	1.0
7439-96-5	Manganese	1.0
7439-97-6	Mercury	1.0
126-98-7	Methacrylonitrile	1.0
67-56-1	Methanol	1.0
72-43-5	Methoxychlor {Benzene, 1,1'-(2,2,2-trichloroethylidene)bis [4-methoxy-]}	1.0
109-86-4	2-Methoxyethanol	1.0
96-33-3	Methyl acrylate	1.0
79-22-1	Methyl chlorocarbonate	1.0
1634-04-4	Methyl tert-butyl ether	1.0

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CAS Number	Toxic Chemical Name	De Minimis Concentration
101-14-4	4,4'-Methylenebis (2-chloroaniline) (MBOCA)	0.1
101-61-1	4,4'-Methylenebis (N,N-dimethyl) benzenamine	0.1
101-68-8	Methylenebis (phenylisocyanate) (MDI)	1.0
74-95-3	Methylene bromide	1.0
101-77-9	4,4'-Methylenedianiline	0.1
78-93-3	Methyl ethyl ketone	1.0
60-34-4	Methyl hydrazine	1.0
74-88-4	Methyl iodide	0.1
108-10-1	Methyl isobutyl ketone	1.0
624-83-9	Methyl isocyanate	1.0
80-62-6	Methyl methacrylate	1.0
109-06-8	2-Methylpyridine	1.0
90-94-8	Michler's ketone	0.1
1313-27-5	Molybdenum trioxide	1.0
76-15-3	(Mono)chloropentafluoroethane (CFC-115)	1.0
505-60-2	Mustard gas (Ethane, 1,1'-thiobis[2-chloro-])	0.1
91-20-3	Naphthalene	1.0
134-32-7	alpha-Naphthylamine	0.1
91-59-8	beta-Naphthylamine	0.1
7440-02-0	Nickel	0.1
7697-37-2	Nitric acid	1.0
139-13-9	Nitrilotriacetic acid	0.1
99-59-2	5-Nitro-o-anisidine	0.1
98-95-3	Nitrobenzene	1.0
92-93-3	4-Nitrobiphenyl	0.1
1836-75-5	Nitrofen (Benzene, 2,4-dichloro-1-(4-nitrophenoxy)-)	0.1
51-75-2	Nitrogen mustard (2-Chloro-N-(2-chloroethyl)-N-methylethanamine)	0.1
55-63-0	Nitroglycerin	1.0
99-55-8	5-Nitro-o-toluidine	1.0
88-75-5	2-Nitrophenol	1.0
100-02-7	4-Nitrophenol	1.0
79-46-9	2-Nitropropane	0.1
156-10-5	p-Nitrosodiphenylamine	0.1
121-69-7	N,N-Dimethylaniline	1.0
924-16-3	N-Nitrosodi-n-butylamine	0.1
55-18-5	N-Nitrosodiethylamine	0.1
62-75-9	N-Nitrosodimethylamine	0.1
86-30-6	N-Nitrosodiphenylamine	1.0
621-64-7	N-Nitrosodi-n-propylamine	0.1
4549-40-0	N-Nitrosomethylvinylamine	0.1
59-89-2	N-Nitrosomorpholine	0.1
759-73-9	N-Nitroso-N-ethylurea	0.1
684-93-5	N-Nitroso-N-methylurea	0.1
16543-55-8	N-Nitrosonornicotine	0.1
100-75-4	N-Nitrosopiperidine	0.1
2234-13-1	Octachloronaphthalene	1.0
20816-12-0	Osmium tetroxide	1.0
123-63-7	Paraldehyde	1.0
56-38-2	Parathion (Phosphorothioic acid, O, O-diethyl-O-(4-nitrophenyl) ester)	1.0
76-01-7	Pentachloroethane	1.0
87-86-5	Pentachlorophenol (PCP)	1.0
79-21-0	Peracetic acid	1.0
108-95-2	Phenol	1.0
106-50-3	p-Phenylenediamine	1.0
90-43-7	2-Phenylphenol	1.0
75-44-5	Phosgene	1.0
7664-38-2	Phosphoric acid	1.0
7723-14-0	Phosphorus (yellow or white)	1.0
85-44-9	Phthalic anhydride	1.0
88-89-1	Picric acid	1.0
1336-36-3	Polychlorinated biphenyls (PCBs)	0.1
23950-58-5	Pronamide	1.0
1120-71-4	Propane sultone	0.1
57-57-8	beta-Propiolactone	0.1
123-38-6	Propionaldehyde	1.0
114-26-1	Propoxur (Phenol, 2-(1-methylethoxy)-, methylcarbamate)	1.0
115-07-1	Propylene (Propene)	1.0
75-55-8	Propyleneimine	0.1
75-56-9	Propylene oxide	0.1
110-86-1	Pyridine	1.0
91-22-5	Quinoline	1.0
106-51-4	Quinone	1.0
82-68-8	Quintozene (Pentachloronitrobenzene)	1.0
81-07-2	Saccharin (manufacturing, no supplier notification) (1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide)	0.1
94-59-7	Safrole	0.1
7782-49-2	Selenium	1.0
7440-22-4	Silver	1.0
100-42-5	Styrene	0.1
96-09-3	Styrene oxide	0.1
7664-93-9	Sulfuric acid	1.0
630-20-6	1,1,1,2-Tetrachloroethane	1.0

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CAS Number	Toxic Chemical Name	De Minimis Concentration
79-34-5	1,1,2,2-Tetrachloroethane	0.1
127-18-4	Tetrachloroethylene {Perchloroethylene}	0.1
961-11-5	Tetrachlorvinphos {Phosphoric acid, 2-chloro-1-(2,4,5-trichlorophenyl) ethenyl dimethyl ester}	1.0
7440-28-0	Thallium	1.0
62-55-5	Thioacetamide	0.1
139-65-1	4,4'-Thiodianiline	0.1
62-56-6	Thiourea	0.1
137-26-8	Thiram	1.0
1314-20-1	Thorium dioxide	1.0
7550-45-0	Titanium tetrachloride	1.0
108-88-3	Toluene	1.0
584-84-9	Toluene-2,4-diisocyanate	0.1
91-08-7	Toluene-2,6-diisocyanate	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	0.1
95-53-4	o-Toluidine	0.1
636-21-5	o-Toluidine hydrochloride	0.1
8001-35-2	Toxaphene	0.1
68-76-8	Triaziquone {2,5-Cyclohexadiene-1,4-dione, 2,3,5-tris(1-aziridinyl)-}	0.1
52-68-6	Trichlorfon {Phosphonic acid,(2,2,2-trichloro-1-hydroxyethyl)-,dimethyl ester}	1.0
120-82-1	1,2,4-Trichlorobenzene	1.0
71-55-6	1,1,1-Trichloroethane {Methyl chloroform}	1.0
79-00-5	1,1,2-Trichloroethane	1.0
79-01-6	Trichloroethylene	1.0
75-69-4	Trichlorofluoromethane {CFC-11}	1.0
95-95-4	2,4,5-Trichlorophenol	1.0
88-06-2	2,4,6-Trichlorophenol	0.1
1582-09-8	Trifluralin {Benzenamine, 2,6-dinitro-N,N-dipropyl-4-(trifluoromethyl)-1}	1.0
95-63-6	1,2,4-Trimethylbenzene	1.0
126-72-7	Tris (2,3-dibromopropyl) phosphate	0.1
72-57-1	Trypan blue	0.1
51-79-6	Urethane {Ethyl carbamate}	0.1
7440-62-2	Vanadium (fume or dust)	1.0
108-05-4	Vinyl acetate	1.0
593-60-2	Vinyl bromide	0.1
75-01-4	Vinyl chloride	0.1
75-35-4	Vinylidene chloride	1.0
1330-20-7	Xylene (mixed isomers)	1.0
108-38-3	m-Xylene	1.0
95-47-6	o-Xylene	1.0
106-42-3	p-Xylene	1.0
87-62-7	2,6-Xylidine	1.0
7440-66-6	Zinc (fume or dust)	1.0
12122-67-7	Zineb {Carbamodithioic acid, 1,2-ethanediylbis-, zinc complex}	1.0

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b. List By CAS Number

CAS Number	Toxic Chemical Name	De Minimis Concentration
50-00-0	Formaldehyde	0.1
51-28-5	2,4-Dinitrophenol	1.0
51-75-2	Nitrogen mustard {2-Chloro-N-(2-chloroethyl)-N-methylethanamine}	0.1
51-79-6	Urethane {Ethyl carbamate}	0.1
52-68-6	Trichlorfon {Phosphonic acid,(2,2,2-trichloro-1-hydroxyethyl)-, dimethyl ester}	1.0
53-96-3	2-Acetylaminofluorene	0.1
55-18-5	N-Nitrosodiethylamine	0.1
55-21-0	Benzamide	1.0
55-63-0	Nitroglycerin	1.0
56-23-5	Carbon tetrachloride	0.1
56-38-2	Parathion {Phosphorothioic acid, O,O-diethyl-O-(4-nitrophenyl)ester}	1.0
57-14-7	1,1-Dimethyl hydrazine	0.1
57-57-8	beta-Propiolactone	0.1
57-74-9	Chlordane {4,7-Methanoindan,1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-}	1.0
58-89-9	Lindane {Cyclohexane,1,2,3,4,5,6-hexachloro-,(1.alpha.,2.alpha., 3.beta., 4.alpha.,5.alpha.,6.beta.)-}	0.1
59-89-2	N-Nitrosomorpholine	0.1
60-09-3	4-Aminoazobenzene	0.1
60-11-7	4-Dimethylaminoazobenzene	0.1
60-34-4	Methyl hydrazine	1.0
60-35-5	Acetamide	0.1
61-82-5	Amitrole	0.1
62-53-3	Aniline	1.0
62-55-5	Thioacetamide	0.1
62-56-6	Thiourea	0.1
62-73-7	Dichlorvos {Phosphoric acid, 2,2-dichloroethenyl dimethyl ester}	1.0
62-75-9	N-Nitrosodimethylamine	0.1
63-25-2	Carbaryl {1-Naphthalenol, methylcarbamate}	1.0
64-18-6	Formic acid	1.0
64-67-5	Diethyl sulfate	0.1
67-56-1	Methanol	1.0
67-63-0	Isopropyl alcohol (manufacturing-strong acid process, no supplier notification)	0.1
67-64-1	Acetone	1.0
67-66-3	Chloroform	0.1
67-72-1	Hexachloroethane	1.0
68-76-8	Triaziquone {2,5-Cyclohexadiene-1,4-dione, 2,3,5-tris(1-aziridinyl)-}	0.1
70-30-4	Hexachlorophene	1.0
71-36-3	n-Butyl alcohol	1.0
71-43-2	Benzene	0.1
71-55-6	1,1,1-Trichloroethane {Methyl chloroform}	1.0
72-43-5	Methoxychlor {Benzene, 1,1'-(2,2,2-trichloroethylidene)bis [4-methoxy-]}	1.0
72-57-1	Trypan blue	0.1
74-83-9	Bromomethane {Methyl bromide}	1.0
74-85-1	Ethylene	1.0
74-87-3	Chloromethane {Methyl chloride}	1.0
74-88-4	Methyl iodide	0.1
74-90-8	Hydrogen cyanide	1.0
74-95-3	Methylene bromide	1.0
75-00-3	Chloroethane {Ethyl chloride}	1.0
75-01-4	Vinyl chloride	0.1
75-05-8	Acetonitrile	1.0
75-07-0	Acetaldehyde	0.1
75-09-2	Dichloromethane {Methylene chloride}	0.1
75-15-0	Carbon disulfide	1.0
75-21-8	Ethylene oxide	0.1
75-25-2	Bromoform {Tribromomethane}	1.0
75-27-4	Dichlorobromomethane	1.0
75-34-3	Ethylidene dichloride	1.0
75-35-4	Vinylidene chloride	1.0
75-44-5	Phosgene	1.0
75-45-6	Chlorodifluoromethane (HCFC-22)	1.0
75-55-8	Propyleneimine	0.1
75-56-9	Propylene oxide	0.1
75-63-8	Bromotrifluoromethane {Halon 1301}	1.0
75-65-0	tert-Butyl alcohol	1.0
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	1.0
75-69-4	Trichlorofluoromethane {CFC-11}	1.0

*C.I. means "Color Index"

CAS Number	Toxic Chemical Name	De Minimis Concentration
75-71-8	Dichlorodifluoromethane (CFC-12)	1.0
76-01-7	Pentachloroethane	1.0
76-13-1	Freon 113 (Ethane, 1,1,2-trichloro-1,2,2-trifluoro-)	1.0
76-14-2	Dichlorotetrafluoroethane (CFC-114)	1.0
76-15-3	Monochloropentafluoroethane (CFC-115)	1.0
76-44-8	Heptachlor (1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene)	1.0
77-47-4	Hexachlorocyclopentadiene	1.0
77-78-1	Dimethyl sulfate	0.1
78-84-2	Isobutyraldehyde	1.0
78-87-5	1,2-Dichloropropane	1.0
78-88-6	2,3-Dichloropropene	1.0
78-92-2	sec-Butyl alcohol	1.0
78-93-3	Methyl ethyl ketone	1.0
79-00-5	1,1,2-Trichloroethane	1.0
79-01-6	Trichloroethylene	1.0
79-06-1	Acrylamide	0.1
79-10-7	Acrylic acid	1.0
79-11-8	Chloroacetic acid	1.0
79-21-0	Peracetic acid	1.0
79-22-1	Methyl chlorocarbonate	1.0
79-34-5	1,1,2,2-Tetrachloroethane	0.1
79-44-7	Dimethylcarbamyl chloride	0.1
79-46-9	2-Nitropropane	0.1
80-05-7	4,4'-Isopropylidenediphenol	1.0
80-15-9	Cumene hydroperoxide	1.0
80-62-6	Methyl methacrylate	1.0
81-07-2	Saccharin (manufacturing, no supplier notification) (1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide)	0.1
81-88-9	C.I. Food Red 15*	0.1
82-28-0	1-Amino-2-methyl-anthraquinone	0.1
82-68-8	Quintozene (Pentachloronitrobenzene)	1.0
84-66-2	Diethyl phthalate	1.0
84-74-2	Dibutyl phthalate	1.0
85-44-9	Phthalic anhydride	1.0
86-30-6	N-Nitrosodiphenylamine	1.0
87-62-7	2,6-Xylidine	1.0
87-68-3	Hexachloro-1,3-butadiene	1.0
87-86-5	Pentachlorophenol (PCP)	1.0
88-06-2	2,4,6-Trichlorophenol	0.1
88-75-5	2-Nitrophenol	1.0
88-89-1	Picric acid	1.0
90-04-0	o-Anisidine	0.1
90-43-7	2-Phenylphenol	1.0
90-94-8	Michler's Ketone	0.1
91-08-7	Toluene-2,6-Diisocyanate	0.1
91-20-3	Naphthalene	1.0
91-22-5	Quinoline	1.0
91-59-8	beta-Napthylamine	0.1
91-94-1	3,3'-Dichlorobenzidine	0.1
92-52-4	Biphenyl	1.0
92-67-1	4-Aminobiphenyl	0.1
92-87-5	Benzidine	0.1
92-93-3	4-Nitrobiphenyl	0.1
94-36-0	Benzoyl Peroxide	1.0
94-58-6	Dihydrosafrole	0.1
94-59-7	Safrole	0.1
94-75-7	2,4-D (Acetic acid, (2,4 dichlorophenoxy)-)	1.0
95-47-6	o-Xylene	1.0
95-48-7	o-Cresol	1.0
95-50-1	1,2 Dichlorobenzene	1.0
95-53-4	o-Toluidine	0.1
95-63-6	1,2,4 Trimethylbenzene	1.0
95-80-7	2,4-Diaminotoluene	0.1
95-95-4	2,4,5-Trichlorophenol	1.0
96-09-3	Styrene oxide	0.1
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	0.1
96-33-3	Methyl acrylate	1.0
96-45-7	Ethylene thiourea	0.1
97-56-3	C.I. Solvent Yellow 3*	0.1
98-07-7	Benzoic trichloride (Benzotrichloride)	0.1
98-82-8	Cumene	1.0
98-86-2	Acetophenone	
98-87-3	Benzal chloride	1.0
98-88-4	Benzoyl chloride	1.0
98-95-3	Nitrobenzene	1.0
99-55-8	5-Nitro-o-toluidine	1.0
99-59-2	5-Nitro-o-anisidine	0.1
99-65-0	m-Dinitrobenzene	1.0
100-02-7	4-Nitrophenol	1.0
100-25-4	p-Dinitrobenzene	1.0
100-41-4	Ethylbenzene	1.0
100-42-5	Styrene	0.1
100-44-7	Benzyl chloride	1.0

*C.I. means "Color Index"

CAS Number	Toxic Chemical Name	De Minimis Concentration
100-75-4	N-Nitrosopiperidine	0.1
101-14-4	4,4'-Methylenebis (2-chloroaniline) (MBOCA)	0.1
101-61-1	4,4'-Methylenebis(N,N-dimethyl) benzenamine	0.1
101-68-8	Methylenebis (phenylisocyanate) (MDI)	1.0
101-77-9	4,4'-Methylenedianiline	0.1
101-80-4	4,4'-Diaminodiphenyl ether	0.1
103-23-1	Bis(2-ethylhexyl) adipate	1.0
104-94-9	p-Anisidine	1.0
105-67-9	2,4-Dimethylphenol	1.0
106-42-3	p-Xylene	1.0
106-44-5	p-Cresol	1.0
106-46-7	1,4-Dichlorobenzene	0.1
106-50-3	p-Phenylenediamine	1.0
106-51-4	Quinone	1.0
106-88-7	1,2-Butylene oxide	1.0
106-89-8	Epichlorohydrin	0.1
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.1
106-99-0	1,3-Butadiene	0.1
107-02-8	Acrolein	1.0
107-05-1	Allyl chloride	1.0
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.1
107-13-1	Acrylonitrile	0.1
107-18-6	Allyl alcohol	1.0
107-21-1	Ethylene glycol	1.0
107-30-2	Chloromethyl methyl ether	0.1
108-05-4	Vinyl acetate	1.0
108-10-1	Methyl isobutyl ketone	1.0
108-31-6	Maleic anhydride	1.0
108-38-3	m-Xylene	1.0
108-39-4	m-Cresol	1.0
108-60-1	Bis(2-chloro-1-methylethyl) ether	1.0
108-88-3	Toluene	1.0
108-90-7	Chlorobenzene	1.0
108-95-2	Phenol	1.0
109-06-8	2-Methylpyridine	1.0
109-77-3	Malononitrile	1.0
109-86-4	2-Methoxyethanol	1.0
110-80-5	2-Ethoxyethanol	1.0
110-82-7	Cyclohexane	1.0
110-86-1	Pyridine	1.0
111-91-1	Bis(2-chloroethoxy)methane	1.0
111-42-2	Diethanolamine	1.0
111-44-4	Bis(2-chloroethyl) ether	1.0
114-26-1	Propoxur (Phenol, 2-(1-methylethoxy)-, methylcarbamate)	1.0
115-07-1	Propylene (Propene)	1.0
115-32-2	Dicofol (Benzenemethanol, 4-chloro-.alpha.-(4-chlorophenyl)-.alpha.-(trichloromethyl)-)	1.0
117-79-3	2-Aminoanthraquinone	0.1
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)	0.1
118-74-1	Hexachlorobenzene	0.1
119-90-4	3,3'-Dimethoxybenzidine	0.1
119-93-7	3,3'-Dimethylbenzidine (o-Tolidine)	0.1
120-12-7	Anthracene	1.0
120-58-1	Isosafrole	1.0
120-71-8	p-Cresidine	0.1
120-80-9	Catechol	1.0
120-82-1	1,2,4-Trichlorobenzene	1.0
120-83-2	2,4-Dichlorophenol	1.0
121-14-2	2,4-Dinitrotoluene	1.0
121-69-7	N,N-Dimethylaniline	1.0
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)	0.1
123-31-9	Hydroquinone	1.0
123-38-6	Propionaldehyde	1.0
123-63-7	Paraldehyde	1.0
123-72-8	Butyraldehyde	1.0
123-91-1	1,4-Dioxane	0.1
124-73-2	Dibromotetrafluoroethane (Halon 2402)	1.0
126-72-7	Tris(2,3-dibromopropyl) phosphate	0.1
126-98-7	Methacrylonitrile	1.0
126-99-8	Chloroprene	1.0
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.1
128-66-5	C.I. Vat Yellow 4*	1.0
131-11-3	Dimethyl phthalate	1.0
132-64-9	Dibenzofuran	1.0
133-06-2	Captan (1H-Isoindole-1,3(2H)-dione, 3a,4,7,7a-tetrahydro-2-[(trichloromethyl)thio]-)	1.0
133-90-4	Chloramben (Benzoic acid, 3-amino-2,5-dichloro-)	1.0
134-29-2	o-Anisidine hydrochloride	0.1
134-32-7	alpha-Naphthylamine	0.1

*C.I. means "Color Index"

CAS Number	Toxic Chemical Name	De Minimis Concentration
135-20-6	Cupferron (Benzeneamine, N-hydroxy-N-nitroso,ammonium salt)	0.1
137-26-8	Thiram	1.0
139-13-9	Nitrilotriacetic acid	0.1
139-65-1	4,4'-Thiodianiline	0.1
140-88-5	Ethyl acrylate	0.1
141-32-2	Butyl acrylate	1.0
151-56-4	Ethyleneimine (Aziridine)	0.1
156-10-5	p-Nitrosodiphenylamine	0.1
156-62-7	Calcium cyanamide	1.0
302-01-2	Hydrazine	0.1
306-83-2	2,2-Dichloro-1,1,1-trifluoro-ethane (HCFC-123)	1.0
309-00-2	Aldrin (1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a, 5,8,8a-hexahydro-(1.alpha., 4.alpha.,4a.beta.,5.alpha., 8.alpha.,8a.beta.)-)	1.0
334-88-3	Diazomethane	1.0
353-59-3	Bromochlorodifluoromethane (Halon 1211)	1.0
354-23-4	1,2-Dichloro-1,1,2-trifluoro-ethante (HCFC-123a)	1.0
354-25-6	1-Chloro-1,1,2,2-tetrafluoro-ethane (HCFC-124a)	1.0
463-58-1	Carbonyl sulfide	1.0
492-80-8	C.I. Solvent Yellow 34* (Aurimine)	0.1
505-60-2	Mustard gas (Ethane,1,1'-thiobis[2-chloro-)	0.1
510-15-6	Chlorobenzilate (Benzeneacetic acid,4-chloro-.alpha.-(4-chlorophenyl)-.alpha.-hydroxy-,ethyl ester)	1.0
528-29-0	o-Dinitrobenzene	1.0
532-27-4	2-Chloroacetophenone	1.0
534-52-1	4,6-Dinitro-o-cresol	1.0
540-59-0	1,2-Dichloroethylene	1.0
541-41-3	Ethyl chloroformate	1.0
541-73-1	1,3-Dichlorobenzene	1.0
542-75-6	1,3-Dichloropropylene	0.1
542-88-1	Bis(chloromethyl) ether	0.1
569-64-2	C.I. Basic Green 4*	1.0
584-84-9	Toluene-2,4-diisocyanate	0.1
593-60-2	Vinyl bromide	0.1
606-20-2	2,6-Dinitrotoluene	1.0
615-05-4	2,4-Diaminoanisole	0.1
621-64-7	N-Nitrosodi-n-propylamine	0.1
624-83-9	Methyl isocyanate	1.0
630-20-6	1,1,1,2-Tetrachloroethane	1.0
636-21-5	o-Toluidine hydrochloride	0.1
680-31-9	Hexamethylphosphoramide	0.1
684-93-5	N-Nitroso-N-methylurea	0.1
759-73-9	N-Nitroso-N-ethylurea	0.1
764-41-0	1,4-Dichloro-2-butene	1.0
812-04-4	1,1-Dichloro-1,2,2-trifluoro-ethane (HCFC)	1.0
842-07-9	C.I. Solvent Yellow 14*	0.1
924-16-3	N-Nitrosodi-n-butylamine	0.1
961-11-5	Tetrachlorvinphos (Phosphoric acid, 2-chloro-1-(2,4,5-trichlorophenyl)ethenyl dimethyl ester)	1.0
989-38-8	C.I. Basic Red 1*	1.0
1120-71-4	Propane sultone	0.1
1163-19-5	Decabromodiphenyl oxide	1.0
1313-27-5	Molybdenum trioxide	1.0
1314-20-1	Thorium dioxide	1.0
1319-77-3	Cresol (mixed isomers)	1.0
1330-20-7	Xylene (mixed isomers)	1.0
1332-21-4	Asbestos (friable)	0.1
1335-87-1	Hexachloronaphthalene	1.0
1336-36-3	Polychlorinated biphenyls (PCBs)	0.1
1344-28-1	Aluminum oxide (fibrous forms)	0.1
1464-53-5	Diepoxybutane	0.1
1582-09-8	Trifluralin (Benzenamine, 2,6- dinitro-N,N-dipropyl-4-(trifluoromethyl)-)	1.0
1634-04-4	Methyl tert-butyl ether	1.0
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC 1416)	1.0
1836-75-5	Nitrofen (Benzene, 2,4-dichloro-1-(4-nitrophenoxy)-)	0.1
1897-45-6	Chlorothalonil (1,3-Benzenedicarbonitrile, 2,4,5,6-tetrachloro-)	1.0
1937-37-7	C.I. Direct Black 38*	0.1
2164-17-2	Fluometuron (Urea, N,N-dimethyl-N'-[3-(trifluoromethyl)phenyl]-)	1.0
2234-13-1	Octachloronaphthalene	1.0
2303-16-4	Diallate (Carbamothioic acid, bis (1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester)	1.0
2602-46-2	C.I. Direct Blue 6*	0.1
2832-40-8	C.I. Disperse Yellow 3*	1.0
2837-89-0	2-Chloro-1,1,1,2-tetrafluoro-ethane (HCFC-124)	1.0

*C.I. means "Color Index"

CAS Number	Toxic Chemical Name	De Minimis Concentration
3118-97-6	C.I. Solvent Orange 7*	1.0
3761-53-3	C.I. Food Red 5*	0.1
4549-40-0	N-Nitrosomethylvinylamine	0.1
4680-78-8	C.I. Acid Green 3*	1.0
6484-52-2	Ammonium nitrate (solution)	1.0
7429-90-5	Aluminum (fume or dust)	1.0
7439-92-1	Lead	0.1
7439-96-5	Manganese	1.0
7439-97-6	Mercury	1.0
7440-02-0	Nickel	0.1
7440-22-4	Silver	1.0
7440-28-0	Thallium	1.0
7440-36-0	Antimony	1.0
7440-38-2	Arsenic	0.1
7440-39-3	Barium	1.0
7440-41-7	Beryllium	0.1
7440-43-9	Cadmium	0.1
7440-47-3	Chromium	0.1
7440-48-4	Cobalt	1.0
7440-50-8	Copper	1.0
7440-62-2	Vanadium (fume or dust)	1.0
7440-66-6	Zinc (fume or dust)	1.0
7550-45-0	Titanium tetrachloride	1.0
7647-01-0	Hydrochloric acid	1.0
7664-38-2	Phosphoric acid	1.0
7664-39-3	Hydrogen fluoride	1.0
7664-41-7	Ammonia	1.0
7664-93-9	Sulfuric acid	1.0
7697-37-2	Nitric acid	1.0
7723-14-0	Phosphorus (yellow or white)	1.0
7782-49-2	Selenium	1.0
7782-50-5	Chlorine	1.0
7783-20-2	Ammonium sulfate (solution)	1.0
8001-35-2	Toxaphene	0.1
8001-58-9	Creosote	0.1
10034-93-2	Hydrazine sulfate	0.1
10049-04-4	Chlorine dioxide	1.0
12122-67-7	Zineb (Carbamodithioic acid, 1,2-ethanediylbis-,zinc complex)	1.0
12427-38-2	Maneb (Carbamodithioic acid, 1,2-ethanediylbis-,manganese complex)	1.0
16071-86-6	C.I. Direct Brown 95*	0.1
16543-55-8	N-Nitrosonornicotine	0.1
20816-12-0	Osmium tetroxide	1.0
23950-58-50	Pronamide	1.0
25321-14-6	Dinitrotoluene (mixed isomers)	1.0
25321-22-6	Dichlorobenzene (mixed isomers)	0.1
25376-45-8	Diaminotoluene (mixed isomers)	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	0.1
39156-41-7	2,4-Diaminoanisole sulfate	0.1
34077-87-7	Dichlorotrifluoroethane	1.0
63938-10-3	Chlorotetrafluoroethane	1.0
90454-18-5	Dichloro-1,1,2-trifluoroethane	1.0

*C.I. means "Color Index"

SECTION 313 TOXIC CHEMICAL CATEGORIES

Section 313 requires reporting on the toxic chemical categories listed below, in addition to the specific toxic chemicals listed above.

The metal compounds listed below, unless otherwise specified, are defined as including any unique chemical substance that contains the named metal (i.e., antimony, copper, etc.) as part of that chemical's structure.

Toxic chemical categories are subject to the 1 percent de minimis concentration unless the substance involved meets the definition of an OSHA carcinogen, which are subject to the 0.1 percent de minimis concentration. The de minimis concentration for each compound is provided in paranthesis.

Antimony Compounds - (Category Code N010) - Includes any unique chemical substance that contains antimony as part of that chemical's infrastructure. (1.0)

Arsenic Compounds - (Category Code N020) - Includes any unique chemical substance that contains arsenic as part of that chemical's infrastructure. (Inorganic compounds: 0.1; organic compounds: 1.0)

Barium Compounds - (Category Code N040) - Includes any unique chemical substance that contains barium as part of that chemical's infrastructure. (1.0)

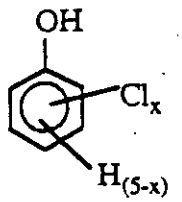
This category does not include:

Chemical	CAS Number
Barium Sulfate	7727-43-7

Beryllium Compounds - (Category Code N050) - Includes any unique chemical substance that contains beryllium as part of that chemical's infrastructure. (Inorganic compounds: 0.1; organic compounds: 1.0)

Cadmium Compounds - (Category Code N078) - Includes any unique chemical substance that contains cadmium as part of that chemical's infrastructure. (Inorganic compounds: 0.1; organic compounds: 1.0)

Chlorophenols - (Category Code N084) - (0.1)



where x = 1 to 5

Chromium Compounds - (Category Code N090) - Includes any unique chemical substance that contains chromium as part of that chemical's infrastructure. (chromium VI compounds: 0.1; chromium III compounds: 1.0)

Cobalt Compounds - (Category Code N096) - Includes any unique chemical substance that contains cobalt as part of that chemical's infrastructure. (1.0)

Copper Compounds - (Category Code N100) - Includes any unique chemical substance that contains copper as part of that chemical's infrastructure. (1.0)

This category does not include:

Chemical	CAS Number
C.I. Pigment Blue 15	147-14-8
C.I. Pigment Green 7	1328-53-6
C.I. Pigment Green 36	14302-13-7

In addition, all Copper Phthalocyanine compounds* that are substituted only with hydrogen and/or bromine or chlorine have been deleted from this category.

Cyanide Compounds - (Category Code N106) - $X^+ CN^-$ where $X = H^+$ or any other group where a formal dissociation may occur. For example, KCN or $Ca(CN)_2$. (1.0)

Ethylenebisdithiocarbamic acid, salts, and esters, (EBDCs)- (Category Code N171)- Includes any unique chemical substance that contains a EBDC salt or ester component as part of that chemicals infrastructure. (1.0)

Certain Glycol Ethers - (Category Code N230) (1.0)

R-(OCH_2CH_2)n-OR'
Where. n = 1,2,or 3
R = alkyl C7 or less; or
R = phenyl or alkyl substituted phenyl;
R'= H, or alkyl C7 or less; or
OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate

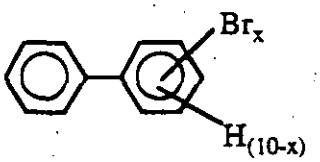
Lead Compounds - (Category Code N420) - Includes any unique chemical substance that contains lead as part of that chemical's infrastructure. (Inorganic compounds: 0.1; organic compounds: 1.0)

Manganese Compounds - (Category Code N450) - Includes any unique chemical substance that contains manganese as part of that chemical's infrastructure. (1.0)

Mercury Compounds - (Category Code N458) - Includes any unique chemical substance that contains mercury as part of that chemical's infrastructure. (1.0)

Nickel Compounds - (Category Code N495) - Includes any unique chemical substance that contains nickel as part of that chemical's infrastructure. (0.1)

Polybrominated Biphenyls (PBBs) - (Category Code N575) - (0.1)



where x = 1 to 10

Selenium Compounds - (Category Code N725) - Includes any unique chemical substance that contains selenium as part of that chemical's infrastructure. (1.0)

* A guidance document listing these copper phthalocyanine compounds is available from the EPCRA Hotline (1-800-535-0202)

*C.I. means "Color Index"

Silver Compounds - (Category Code N740) - Includes any unique chemical substance that contains silver as part of that chemical's infrastructure. (1.0)

Thallium Compounds - (Category Code N760) - Includes any unique chemical substance that contains thallium as part of that chemical's infrastructure. (1.0)

Warfarin and salts - (Category Code N874) Includes any unique chemical substance that contains warfarin or a warfarin salt component as part of that chemicals infrastructure. (1.0)

Zinc Compounds - (Category Code N982) - Includes any unique chemical substance that contains zinc as part of that chemical's infrastructure. (1.0)

*C.I. means "Color Index"

Appendix 2

Information Sources

(Source: Appendices F & G, *Toxic Chemical Release Inventory Reporting Form R and Instruction*, EPA 745-K-95-051)

APPENDIX F. STATE DESIGNATED SECTION 313 CONTACTS

Note: **Use the appropriate address for submission of Form R reports to your State. In addition, many States have additional State reporting requirements. Check with your State contact on any State requirements.**

Alabama
Mr. Edward Pooles
Alabama Emergency Response Commission
Alabama Department of Environmental Management
1751 Congressman W.L. Dickinson Drive
Montgomery, AL 36109
(205) 260-2717

Alaska
Ms. Camille Stephens
Alaska State Emergency Response Commission
Department of Environmental Conservation
410 Willoughby, Suite 105
Juneau, AK 99801-1795
(907) 465-5220

American Samoa
Goipa Tausaga
American Samoa EPA
Office of the Governor
Pago Pago, AS 96799
International Number (684) 633-2304

Arizona
Mr. Daniel Roe, Acting Executive Director
Arizona Emergency Response Commission
Division of Emergency Services
5636 East McDowell Road
Phoenix, AZ 85008
(602) 231-6346

Arkansas
Mr. John Ward
Arkansas Department of Pollution Control and Ecology
P.O. Box 8913
8001 National Drive
Little Rock, AR 72219-8913
(501) 562-7444

California
Mr. Stephen Hanna
Assistant for Environmental Information
California Environmental Protection Agency
555 Capitol Mall, Suite 235
Sacramento, CA 95814
(916) 324-9924

Colorado
Winifred Bromley
Colorado Emergency Planning Commission
Colorado Department of Health
4300 Cherry Creek Drive South
Denver, CO 80222-1530
(303) 692-3434

Commonwealth of Northern Mariana Islands
Mr. Frank Russell Meecham, III
Division of Environmental Quality
P.O. Box 1304
Saipan, MP 96950
(670) 234-6984

Connecticut
SARA Title III Coordinator
Department of Environmental Protection
C/O Waste Management
79 Elm St.
Hartford, CT 06106-5127
(203)424-3373

Delaware
Mr. Robert Pritchett
Division of Air and Waste Management
Department of Natural Resources and Environmental Control
89 King's Highway
P.O. Box 1401
Dover, DE 19903
(302) 739-4791

District of Columbia
Ms. Pamela Thuber, Environmental Planning Specialist
Office of Emergency Preparedness
2001 14th Street, NW, 8th Floor
Washington, DC 20009
(202) 727-6161

Florida
Mr. Sam Brackett
State Emergency Response Commission
Florida Department of Community Affairs
2740 Centerview Drive
Tallahassee, FL 32399-2100
(904) 488-1472
In Florida: 800-635-7179

Georgia
Mr. Burt Langley
Georgia Emergency Response Commission
7 Martin Luther King Dr. Room 139
Atlanta, GA 30334
(404) 656-6905

Guam
Mr. Fred Castro
Guam EPA
D-107 Harmon Plaza
130 Rojas Street
Harmon, GU 96911
(671) 646-8864

Hawaii
Ms. Marsha Mealey
Hawaii State Emergency Response Commission
Hawaii State Department of Health
5 Waterfront Plaza, Suite 250C
500 Alamona Blvd.
Honolulu, HI 96813
(808) 586-4249

Idaho
Ms. Margaret Ballard
Idaho Emergency Response Commission
1109 Main St.
State House
Boise, ID 83720-7000
(208) 334-3263

Illinois
Mr. Joe Goodner
Emergency Planning Unit
Office of Chemical Safety
Illinois EPA
P.O. Box 19276
2200 Churchill Road
Springfield, IL 62794-9276
(217) 785-0830

Indiana
Mr. Tom Neltner
Indiana Department of Environmental Management
Office of Pollution Prevention Technical Assistance
100 North Senate (N-1355)
Box 6015
Indianapolis, IN 46206-6015

Iowa
Mr. Pete Hamlin
Department of Natural Resources
Wallace Building
900 East Grand Avenue
Des Moines, IA 50319
(515) 281-8852

Kansas
Mr. Jon Flint
Right-to-Know Program
Kansas Emergency Response Commission
J Street and 2 North
Building 283, Forbes Field
Topeka, KS 66620
(913) 296-1690

Kentucky
Mr. Alex Barber
Kentucky Department for Environmental Protection
14 Reilly Road
Frankfort, KY 40601
(502) 564-2150

Louisiana
Ms. Jeanie Anderson-LaBar
Department of Environmental Quality
P.O. Box 82263
7890 Bluebonnet
Baton Rouge, LA 70810-2263
(504) 765-0737

Maine
Ms. Rayna Leibowitz
State Emergency Response Commission
State House Station Number 72
Augusta, ME 04333
(207) 287-4080
In Maine: (800) 452-8735

Maryland
Ms. Patricia Williams
State Emergency Response Commission
Maryland Department of the Environment
Toxics Information Center
2500 Broening Highway
Baltimore, MD 21224
(410) 631-3800

Massachusetts
Ms. Suzi Peck
Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
1 Winter Street
Boston, MA 02108
(617) 292-5870

Michigan
Mr. Jim Duszyinski
Title III Coordinator
Michigan Department of Natural Resources
Environmental Response Division
Title III Unit
P.O. Box 30426
Lansing, MI 48909

certified mail only:
300 South Washington Square
Title III, 5th Floor
Lansing, MI 48909
(517) 373-8481

Minnesota
Mr. Steve Tomlyanovich
Minnesota Emergency Response Commission
B5 State Capitol Bldg.
75 Constitution Ave.
St Paul, MN 55155
(612) 282-5396

Mississippi
Mr. John David Burns
Mississippi Emergency Response Commission
Mississippi Emergency Management Agency
P.O. Box 4501
Jackson, MS 39296-4501

certified mail only:
1410 Riverside Drive
Jackson, MS 39202
(601) 960-9000

Missouri
Mr. Dean Martin
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

certified mail only:
Missouri Department of Natural Resources
2710 West Main
Jefferson City, MO 65109
(314) 526-3901or
(314) 526-3371

Montana
Mr. Tom Ellerhoff, Co-Chairman
Montana Emergency Response Commission
Environmental Sciences Division
Department of Health & Environmental Sciences
Capitol Station
Cogswell Building A-107
P.O. Box 200901
Helena, MT 59620-0901
(406) 444-3948

Nebraska
Mr. John Steinauer, Coordinator
State of Nebraska Department of Environmental Quality
P.O. Box 98922
Lincoln, NE 68509-8922

certified mail only:
1200 N Street, Suite 400
Lincoln, NE 68508
(402) 471-4251

Nevada
Ms. Kathy Esparaza
Division of Emergency Management
2525 South Carson Street
Carson City, NV 89710
(702) 687-7374

New Hampshire
Mr. George L. Iverson, Director
New Hampshire State Emergency Management Agency
Title III Program
State Office Park South
107 Pleasant Street
Concord, NH 03301
(603) 271-2231

New Jersey
Ms. Shirlee Schiffman
Department of Environmental Protection and Energy
Division of Environmental Quality, Safety, Health, and Analytical Programs
SARA Title III Section 313
Bureau of Hazardous Substances Information
401 E. State St. (CN-405)
Trenton, NJ 08625
(609) 984-3219

New Mexico
Mr. Max Johnson, Title III Coordinator
New Mexico Emergency Response Commission
Chemical Safety Office, Emergency Management Bureau
P.O. Box 1628
Santa Fe, NM 87504-1628

certified mail only:
4491 Cerrillos Road
Santa Fe, NM 87504
(505) 827-9223

New York
Mr. William Miner
New York Emergency Response Commission
New York State Department Of Environmental Conservation
Bureau of Spill Prevention and Response
50 Wolf Road/Room 340
Albany, NY 12233-3510
(518)457-4107

North Carolina
Ms. Emily Kilpatrick
North Carolina Emergency Response Commission
North Carolina Division of Emergency Management
116 West Jones Street
Raleigh, NC 27603-1335
(919) 733-3865

North Dakota
Mr. Douglas C. Friez
North Dakota Emergency Response Commission
Division of Emergency Management
P.O. Box 5511
Bismarck, ND 58502-5511
(701) 328-3300

Ohio
Ms. Cindy DeWulf
Ohio EPA
Division of Air Pollution Control
1800 Watermark Drive
Columbus, OH 43215
(614) 644-3604

Oklahoma
Larry Gales
Department of Environmental Quality Support Services
1000 N.E. 10th Street
Oklahoma City, OK 73117-1212
(405) 271-8062

Oregon
Mr. Dennis Walthall
Oregon Emergency Response Commission
c/o State Fire Marshall
4760 Portland Road, N.E.
Salem, OR 97305-1760
(503) 378-3473

Pennsylvania
Mr. James Tinney
Pennsylvania Emergency Management Council
Bureau of Worker and Community Right-to-Know
Room 1503
Labor and Industry Building
7th & Forster Streets
Harrisburg, PA 17120
(717) 783-2071

Puerto Rico
Mr. Genaro Toress
Puerto Rico Emergency Response Commissioner
Title III-SARA Section 313
Puerto Rico Environmental Quality Board
Semades Junco Station
P.O. Box 11488
Santurce, PR 00910

certified mail only:
Environmental Quality Board
Emergency Response and Remedial Office
National Plaza #431
Ponce de Leon Avenue
Hato Rey, PR 00917
(809) 766-8056

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

South Carolina
Mr. Michael Juras
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
Attn: EPCRA Reporting
(803) 935-6336

South Dakota
Ms. Lee Ann Smith, Title III Coordinator
South Dakota Emergency Response Commission
South Dakota Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181
(605) 773-3296

Tennessee
Mr. Lacy Suiter, Chairman
Tennessee Emergency Response Commission
Director, Tennessee Emergency Management Agency
3041 Sidco Drive
Nashville, TN 37204
(615) 741-0001
1-800-262-3300 (in Tennessee)
1-800-258-3300 (out of state)

Texas
Ms. Becky Kurka, Supervisor
Office of Pollution Prevention and Recycling
Texas Natural Resources Conservation Commission
P.O. Box 13087
Austin, TX 78711-3087
(512) 239-3100

Utah
Mr. John Jones
Utah Hazardous Chemical Emergency Response Commission
Utah Department of Environmental Quality
Division of Environmental Response and Remediation
168 North 1950 West
Salt Lake City, UT 84116-4840
(801) 536-4100

Vermont
Mr. Ray McCandless
Department of Health
108 Cherry Street
Burlington, VT 05402
(802) 8265-7730

Virginia
Mr. Roland Owens
Virginia Emergency Response Council
P.O. Box 10009
Richmond, VA 23240-0009

certified mail only:
Virginia Department of Environmental Quality
SARA Title III Program
9th Floor
629 E. Main St.
Richmond, VA 23219
(804) 762-4482

Virgin Islands
Mr. Roy E. Adams, Commissioner
Department of Planning and Natural Resources
U.S. Virgin Islands Emergency Response Commission
Title III
Nisky Center, Suite 231
Charlotte Amalie
St. Thomas, VI 00802
(809) 774-3320/Ext. 101 or 102

Washington
Ms. Idell Hansen, Supervisor
Community Right-To-Know Unit
Department of Ecology
P.O. Box 47659
Olympia, WA 98504-7659

certified mail only:
300 Desmond Road
Lacey, WA 98503
(206) 407-6727

West Virginia
Mr. Carl L. Bradford, Director
West Virginia Emergency Response Commission
West Virginia Office of Emergency Services
Main Capital Building 1, Room EB-80
Charleston, WV 25305-0360
(304) 558-5380

Wisconsin
Department of Natural Resources
101 South Webster
P.O. Box 7921
Madison, WI 53707
Attn: Russ Dunst, Toxics Coordinator
(608) 266-9255

Wyoming
Chairman, Mr. Mike Davis
Wyoming Emergency Response Commission
Wyoming Emergency Management Agency
Department of Environmental Quality
Herschler Building 4 West
122 West 25th St.
P.O. Box 1709
Cheyenne, WY 82002
(307) 777-4900

Notes:

(1) If an Indian tribe has chosen to act independently of a state for the purpose of section 313 reporting, facilities located within that Indian community should report to the tribal SERC, or until the SERC is established, the Chief Executive Officer of the Indian tribe, as well as to EPA;
(2) Facilities located within the Territories of the Pacific should send a report to the Chief Administrator of the appropriate territory, as well as to EPA.

APPENDIX G. SECTION 313 EPA REGIONAL CONTACTS

Region 1

Pesticides & Toxics Branch
USEPA Region 1 (ATR)
JFK Federal Bldg.
P.O. Box ATO
Boston, MA 02203
(617) 565-3932

Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont

Region 2

Pesticides & Toxics Branch
USEPA Region 2 (MS-105)
2890 Woodbridge Avenue, Building 10
Edison, NJ 08837-3679
(908) 906-6890

New Jersey, New York, Puerto Rico, Virgin Islands

Region 3

Toxics & Pesticides Branch
USEPA Region 3 (3AT31)
841 Chestnut Street Bldg.
Philadelphia, PA 19107
(215) 597-1260

Delaware, Maryland, Pennsylvania, Virginia, West Virginia, District of Columbia

Region 4

Pesticides & Toxics Branch
Title III Unit
USEPA Region 4
345 Courtland Street, NE
Atlanta, GA 30365
(404) 347-1033

Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

Region 5

Pesticides & Toxic Substances Branch
USEPA Region 5 (SP-14J)
77 West Jackson Blvd.
Chicago, IL 60604
(312) 353-5907

Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

Region 6

Pesticides & Toxic Substances Branch
USEPA Region 6 (6TPT)
1445 Ross Avenue
Suite 1200
Dallas, TX 75202-2733
(214) 655-7244

Arkansas, Louisiana, New Mexico, Oklahoma, Texas

Region 7

Toxics & Pesticides Branch (TOPE)
USEPA Region 7
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7020

Iowa, Kansas, Missouri, Nebraska

Region 8

Toxic Substances Branch
USEPA Region 8 (8ART-TS)
999 18th Street. Suite 500
Denver, CO 80202-2466
(303) 293-1730

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

Region 9

Pesticides & Toxics Branch
USEPA Region 9 (A-4-4)
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-1087

Arizona, California, Hawaii, Nevada, American Samoa, Guam, Commonwealth of the Northern Mariana Islands

Region 10

Pesticides & Toxic Substances Branch
USEPA Region 10 (AT083)
1200 Sixth Avenue
Seattle, WA 98101
(206) 553-4016

Alaska, Idaho, Oregon, Washington

Appendix 3

Toxic Release Inventory Reporting Modifications Beginning with 1995 Reporting Year

(Source: US Environmental Protection Agency, Office of Pollution Prevention and Toxics, EPA 745-R-95-009, February 1995)

United States Environmental Protection Agency
Office of Pollution Prevention and Toxics Washington, DC 20460
February 1995
EPA 745-R-95-009

TOXICS RELEASE INVENTORY

Reporting Modifications Beginning With 1995 Reporting Year

Section 313 of EPCRA requires certain facilities manufacturing, processing, or otherwise using listed toxic chemicals to report their environmental releases of such chemicals annually. Beginning with the 1991 reporting year, such facilities also must report pollution prevention and recycling data for such chemicals, pursuant to section 6607 of the Pollution Prevention Act, 42 U.S.C. 13106. When enacted, section 313 established an initial list of toxic chemicals that was comprised of more than 300 chemicals and 20 chemical categories. Section 313(d) authorizes EPA to add chemicals to or delete chemicals from the list, and sets forth criteria for these actions. The current EPCRA section 313 toxic chemical list contains over 650 chemicals and chemical categories.

The following information is provided to alert facilities of recent reporting modifications to the EPCRA section 313 reporting requirements beginning with the 1995 reporting year. **These modifications do not apply to the forms being submitted on or before July 1, 1995 (covering the 1994 reporting year).** However, since these modifications are effective January 1, 1995, facilities should begin to apply these modifications to their data collection activities for 1995 reporting (reports due on or before July 1, 1996).

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Section 1. Alternate Threshold Option

EPA has finalized a reporting modification that is effective for activities beginning on January 1, 1995. In the Final rule, 59 FR 61488 entitled "TRI Alternate Threshold for Facilities with Low Annual Reportable Amounts", EPA established a reduced reporting option for facilities meeting TRI reporting thresholds for a listed chemical, but that do not exceed 500 pounds for the total annual reportable amount (defined below) for that chemical. A facility that does not exceed the 500 pound criteria is eligible to apply an alternate manufacture, process or otherwise use threshold of 1 million pounds to that chemical. If the facility does not exceed the 1 million pound threshold, then the facility is eligible to submit a certification statement in lieu of a full Form R for activities beginning January 1, 1995. **(Please note that this reduced reporting option does not apply to reports due July 1, 1995.)**

What Is the Certification Statement?

The certification statement is a simplified form of reporting and is intended as a means to reduce the compliance burden associated with EPCRA section 313. The certification statement must be submitted on an annual basis for each eligible chemical. The information submitted on the certification statement includes facility identification information and the chemical or chemical category identity. The information submitted on the certification statement will appear in the TRI data base in the same manner that information submitted on Form R appears. An approved certification statement and a magnetic version of reporting will be made available in the 1995 Form and Instructions package.

What Is the Total Annual Reportable Amount?

For the purpose of this reporting modification, the annual reportable amount is equal to the combined total quantities released at the facility, disposed within the facility, treated at the facility (as represented by amounts destroyed or converted by treatment processes), recovered at the facility as a result of recycle operations, combusted for the purpose of energy recovery at the facility, and amounts transferred from the facility to off-site locations for the purpose of recycle, energy recovery, treatment, and/or disposal. These volumes correspond to the sum of amounts reportable for data elements on EPA Form R (EPA Form 9350-1; Rev. 12/4/93) as Part II column B of section 8, data elements 8.1 (quantity released), 8.2 (quantity used for energy recovery on-site), 8.3 (quantity used for energy recovery off-site), 8.4 (quantity recycled on-site), 8.5 (quantity recycled off-site), 8.6 (quantity treated on-site), and 8.7 (quantity treated off-site).

Recordkeeping

Each owner or operator who determines that they are eligible, and wishes to apply the alternate threshold to a particular chemical, must retain records substantiating this determination for a period of 3 years from the date of the submission of the certification statement. These records must include sufficient documentation to support calculations as well as the calculations made by the facility that confirm their eligibility for each chemical for which the alternate threshold was applied.

A facility that fits within the category description, and manufactures, processes or otherwise uses no more than 1 million pounds of a listed toxic chemical annually, and whose owner/operator elects to take advantage of the alternate threshold is not considered an EPCRA section 313 covered facility for that chemical for the purpose of submitting a Form R. This

determination may provide further regulatory relief from other federal or state regulations that apply to facilities on the basis of their EPCRA section 313 reporting status. A facility will need to reference other applicable regulations in order to determine their actual requirements that may be affected by this reporting modification.

Multi-Establishment Facilities

For the purposes of the certification statement, the facility must also make its determination based upon the entire facility's operations including all of its establishments. If the facility as a whole is able to take advantage of the alternate threshold, a single certification is required. EPA can see no benefit in allowing a facility with multiple establishments to submit more than one certification statement for each of the chemicals for which it is eligible. The eligibility to submit a certification statement is made on a whole facility determination. Thus all of the information necessary to make the determination has been assembled to the facility level. No other detail is required by the certification statement and, therefore, no apparent benefit is provided to the facility in having it submit multiple statements containing duplicative information.

EPA also believes that multiple submissions of certification statements for the same chemical from the same facility provides a greater opportunity for the data to be misinterpreted. If, for example, a user of the data were interested in a facility's chemical management practices and found more than one certification for the same chemical as it would appear in the database, then the user might incorrectly assume that the facility managed the maximum of 500 pounds for the annual reportable amount for that chemical times the number of certification statements appearing in the database for the same chemical from another establishment. For these reasons, EPA is not providing "partial facility" or multiple submissions of the certification statement by multi-establishment facilities.

Trade Secrets

At this time, EPA is requiring that a facility submit a unique certification statement for each chemical meeting the conditions of the alternate threshold. Facilities may assert a trade secrecy claim for a chemical identity on the certification statement as on the Form R. Reports submitted on a per chemical basis protect against the disclosure of trade secrets. Certification statements with trade secrecy claims, like Form Rs with similar claims, will be separately handled upon receipt to protect against disclosure. Commingling trade secret chemical identities with non-trade secret chemical identities on the same submission increases the risk of disclosure. Also, processing techniques currently in place make handling of one form with more than one chemical difficult. Further, this will more likely result in increased submission errors on the part of Form R reporters.

Metals and Metal Compounds

For metal compounds, the category level of 500 pounds applies to the amount of parent metal waste that is reported on Form R, but the thresholds apply to the amount of metal compounds manufactured, processed, or otherwise used.

For Form R reporting involving both parent metals and associated metal compounds, the one million pound alternate threshold must be applied separately to the parent metal and the associated metal compound(s). Threshold determinations must be made independently for each because they are separately listed toxic chemicals. If the threshold is exceeded for the parent metal but not the associated metal compounds, then the releases of metal reported on Form R for the parent metal should not include the releases from the metal compounds. If both the parent metal or

the associated metal compounds exceed the alternate threshold, then the facility has the option of filing one Form R for both, using the metal compound name and reporting total releases based on parent metal content. If neither the parent metal not the associated metal compounds exceed the alternate threshold, then the facility should file a certification statement for each, since the reporting thresholds must be applied to each listed parent metal and each metal compound category. EPA believes it is appropriate to make this distinction between filing the Form R and the certification statement because the Form R accounts for amounts of metal released or otherwise managed and the certification statement verifies that the alternate threshold for each listed chemical or chemical category has not been exceeded.

Similarly, separate certification statements should be submitted for all other listed chemicals even if EPA allows one Form R to be filed for two or more listed chemicals, e.g., o-xylene, p-xylene and xylene (mixed isomers). For example, if a facility processes in three separate process streams, xylene (mixed isomers), o-xylene, and p-xylene, and exceeds the conditions of the alternate threshold for each of these listed substances, the facility may combine the appropriate information on the o-xylene, p-xylene, and xylene (mixed isomers) into one Form R.

Facilities that process o-xylene, p-xylene, and xylene (mixed isomers) in separate process streams and do not exceed the conditions of the alternate threshold for one or more of the compounds, may submit a separate certification statement for each of the forms of xylene meeting the alternate threshold and report on Form R for those forms that do not. Similar to reporting on the parent metals and metal compounds described above, facilities that process all forms of xylene with a combined activity level within the conditions of the alternate threshold should file a separate certification statement for each form of xylene.

Section 2. Expansion of the Toxic Chemical List

On November 30, 1994 (59 FR 61432), EPA finalized the addition of 286 chemicals and chemical categories to the EPCRA section 313 toxic chemical list. These additions include 39 chemicals as part of two delimited chemical categories. These chemicals are effective for the 1995 reporting year with first reports due on or before July 1, 1996.

Chemical Categories

Of the 286 additions, six are chemical categories. Two of these categories (diisocyanates and polycyclic aromatic compounds (PACs)) are delimited, they consist only of the members listed as part of the category. The diisocyanates category consists of 20 specific members and the PACs category has 19 specific members. Only the members that are listed as part of the category are subject to EPCRA section 313 reporting.

The polychlorinated alkanes category (C_{10} to C_{13}) is defined by chemical formula. Therefore, only those chemicals which are covered by the chemical formula would be subject to EPCRA section 313 reporting. This category includes mixtures containing short-chain polychlorinated alkanes as well as individual isomers.

Another category that was added is water dissociable nitrate compounds (aqueous solution only). Only those nitrate compounds that dissociate in water are covered by this category. Furthermore, threshold and release calculations are only applicable when the nitrate compounds are present in an aqueous solution. Reporting for this category is similar to the metal compound categories. The total weight of the nitrate compounds are counted toward threshold determinations, but only the weight of nitrate is considered in reporting release and other waste management data on the Form R. It should be noted that treatment of nitric acid through pH adjustment will generate a covered nitrate compound.

The final two categories added are nicotine and salts and strychnine and salts. Any compound that contains nicotine, strychnine, or salts of these two chemicals is subject to the EPCRA section 313 reporting requirements.

Other Significant Issues

A majority of the chemicals that were added to the toxic chemical list are active ingredient pesticides. Currently, only the manufacturing sector (Standard Industrial Classification codes 20-39) are covered by the EPCRA section 313 reporting requirements. Use of these pesticides at facilities outside of these SIC codes would not be subject to EPCRA section 313 reporting requirements (e.g., stand alone farms). However, if a covered facility manufactures, processes (including formulates or repackages the chemical) or otherwise uses one of the listed active ingredients above threshold levels then they must submit a Form R for that chemical. Application of an active ingredient pesticide to crops that are part of a covered facility must be included in the otherwise use threshold determination. For example, if a covered multi-establishment facility both grows and cans a product on-site the use of any listed pesticides on the crops would be counted towards the otherwise use threshold. However, if the pesticide is used in routine janitorial/facility grounds maintenance then it is exempt from threshold determinations and release reporting.

Availability of Additional/Revised Guidance Documents

EPA has updated two list-related guidance documents (List of Lists; Common Synonyms for Chemicals Subject to EPCRA section 313) to include the newly added chemicals. In addition, EPA has developed specific guidance documents for each of the new chemical categories. These category guidance documents are intended to assist facilities in determining if a chemical is a member of a category and how to correctly report for the new categories.

A list of the available guidance documents is provided below. All of the guidance documents are available from the Emergency Planning and Community Right-to-Know Information Hotline at 1-800-535-0202.

Document Name	Document Number
List of Lists	EPA 740-R-95-001
Common Synonyms for Chemicals listed under EPCRA section 313	EPA 745-R-95-008
List of Chemicals within the Nicotine and salts Category and Guidance for Reporting	EPA 745-R-95-004
List of Chemicals within the Nitrate Compounds Category and Guidance for Reporting	EPA 745-R-95-002
List of Chemicals within the Polychlorinated Alkanes Category and Guidance for Reporting	EPA 745-R-95-001
List of Chemicals within the Polycyclic Aromatic Compounds Category and Guidance for Reporting	EPA 745-R-95-003
List of Chemicals within the Strychnine and salts Category and Guidance for Reporting	EPA 745-R-95-005

Section 3. List of Newly Added Chemicals

Chemical name	CAS No.
Abamectin [Avermectin B1]	71751-41-2
Acephate (Acetylphosphoramidothioic acid O,S-dimethyl ester)	30560-19-1
Acifluorfen, sodium salt [5-(2-Chloro-4-(trifluoromethyl) phenoxy)-2-nitro-benzoic acid, sodium salt]	62476-59-9
Alachlor	15972-60-8
Aldicarb	116-06-3
d-trans-Allethrin [d-trans-Chrysanthemic acid of d-allethrone]	28057-48-9
Allylamine	107-11-9
Aluminum phosphide	20859-73-8
Ametryn (N-Ethyl-N'-(1-methylethyl)-6-(methylthio)-1,3,5,- triazine- 2,4-diamine)	834-12-8
Amitraz	33089-61-1
Anilazine [4,6-dichloro-N-(2-chlorophenyl)-1,3,5-triazin-2-amine]	101-05-3
Atrazine (6-Chloro-N-ethyl-N'-(1-methylethyl)-1,3,5,-triazine-2,4-diamine)	1912-24-9
Bendiocarb [2,2-Dimethyl-1,3-benzodioxol-4-ol methylcarbamate]	22781-23-3
Benfluralin (N-Butyl-N-ethyl-2,6-dinitro-4-(trifluoromethyl) benzenamine)	1861-40-1
Benomyl	17804-35-2
Bifenthrin	82657-04-3
Bis(tributylin) oxide	56-35-9
Boron trichloride	10294-34-5
Boron trifluoride	7637-07-2
Bromacil (5-Bromo-6-methyl-3-(1-methylpropyl)-2,4 (1H,3H)-pyrimidinedione)	314-40-9
Bromacil, lithium salt [2,4(1H,3H)-Pyrimidinedione, 5-bromo-6-methyl-3-(1-methylpropyl), lithium salt]	53404-19-6
Bromine	7726-95-6
1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	35691-65-7
2-Bromo-2-nitropropane-1,3-diol (Bronopol)	52-51-7
Bromoxynil (3,5-Dibromo-4-hydroxybenzonitrile)	1689-84-5
Bromoxynil octanoate (Octanoic acid, 2,6-dibromo-4-cyanophenyl ester)	1689-99-2
Brucine	357-57-3
C.I. Acid Red 114	6459-94-5
C.I. Direct Blue 218	28407-37-6
Carbofuran	1563-66-2
Carboxin (5,6-Dihydro-2-methyl-N-phenyl-1,4-oxathiin-3-carboxamide)	5234-68-4
Chinomethionat [6-Methyl-1,3-dithiolo[4,5-b]quinoxalin-2-one]	2439-01-2
Chlorendic acid	115-28-6

Chlorimuron ethyl [Ethyl-2-[[[(4-chloro-6-methoxyprimidin-2-yl)-carbonyl]-amino]sulfonyl] benzoate]	90982-32-4
1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	4080-31-3
p-Chloroaniline	106-47-8
3-Chloro-2-methyl-1-propene	563-47-3
p-Chlorophenyl isocyanate	104-12-1
Chloropicrin	76-06-2
3-Chloropropionitrile	542-76-7
p-Chloro-o-toluidine	95-69-2
2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	75-88-7
Chlorotrifluoromethane (CFC-13)	75-72-9
3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)	460-35-5
Chlorpyrifos methyl[O,O-dimethyl-O-(3,5,6-trichloro-2-pyridyl)phosphorothioate	5598-13-0
Chlorsulfuron [2-chloro-N-[[4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]benzenesulfonamide]	64902-72-3
Crotonaldehyde	4170-30-3
Cyanazine	21725-46-2
Cycloate	1134-23-2
Cyclohexanol	108-93-0
Cyfluthrin [3-(2,2-Dichloroethenyl)-2,2-dimethylcyclo-propanecarboxylic acid, cyano(4-fluoro-3-phenoxyphenyl) methyl ester]	68359-37-5
Cyhalothrin [3-(2-Chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylic acid cyano(3-phenoxyphenyl) methyl ester]	68085-85-8
Dazomet (Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione)	533-74-4
Dazomet, sodium salt [2H-1,3,5-Thiadiazine-2-thione, tetrahydro-3,5-dimethyl-, ion(1-), sodium]	53404-60-7
2,4,-DB	94-82-6
2,4-D butoxyethyl ester	1929-73-3
2,4-D butyl ester	94-80-4
2,4-D chlorocrotyl ester	2971-38-2
Desmedipham	13684-56-5
2,4-D 2-ethylhexyl ester	1928-43-4
2,4-D 2-ethyl-4-methylpentyl ester	53404-37-8
Diazinon	333-41-5
2,2-Dibromo-3-nitrilopropionamide	10222-01-2
Dicamba (3,6-Dichloro-2-methoxybenzoic acid)	1918-00-9
Dichloran [2,6-Dichloro-4-nitroaniline]	99-30-9
3,3'-Dichlorobenzidine dihydrochloride	612-83-9
3,3'-Dichlorobenzidine sulfate	64969-34-2
trans-1,4-Dichloro-2-butene	110-57-6
1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	1649-08-7
Dichlorofluoromethane (HCFC-21)	75-43-4
Dichloropentafluoropropane	127564-92-5
1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	13474-88-9
1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	111512-56-2
1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)	422-44-6
1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)	431-86-7

1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	507-55-1
1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea)	136013-79-1
2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)	128903-21-9
2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)	422-48-0
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	422-56-0
Dichlorophene [2,2'-Methylenebis(4-chlorophenol)]	97-23-4
trans-1,3-Dichloropropene	10061-02-6
Diclofop methyl [2-[4-(2,4-Dichlorophenoxy)phenoxy] propanoic acid, methyl ester]	51338-27-3
Dicyclopentadiene	77-73-6
Diethatyl ethyl	38727-55-8
Diflubenzuron	35367-38-5
Diglycidyl resorcinol ether	101-90-6
Dimethipin [2,3,-Dihydro-5,6-dimethyl-1,4-dithiin 1,1,4,4-tetraoxide]	55290-64-7
Dimethoate	60-51-5
3,3'-Dimethoxybenzidine dihydrochloride (o-Dianisidine dihydrochloride)	20325-40-0
3,3'-Dimethoxybenzidine hydrochloride (o-Dianisidine hydrochloride)	111984-09-9
Dimethylamine	124-40-3
Dimethylamine dicamba	2300-66-5
3,3'-Dimethylbenzidine dihydrochloride (o-Tolidine dihydrochloride)	612-82-8
3,3'-Dimethylbenzidine dihydrofluoride (o-Tolidine dihydrofluoride)	41766-75-0
Dimethyl chlorothiophosphate	2524-03-0
Dimethyldichlorosilane	75-78-5
N,N-Dimethylformamide	68-12-2
2,6-Dimethylphenol	576-26-1
Dinitrobutyl phenol (Dinoseb)	88-85-7
Dinocap	39300-45-3
Diphenamid	957-51-7
Diphenylamine	122-39-4
Dipotassium endothall [7-Oxabicyclo(2.2.1)heptane-2,3-dicarboxylic acid, dipotassium salt]	2164-07-0
Dipropyl isocinchomeronate	136-45-8
Disodium cyanodithioimidocarbonate	138-93-2
2,4-D isopropyl ester	94-11-1
2,4-Dithiobiuret	541-53-7
Diuron	330-54-1
Dodine [Dodecylguanidine monoacetate]	2439-10-3
2,4-DP	120-36-5
2,4-D propylene glycol butyl ether ester	1320-18-9
2,4-D sodium salt	2702-72-9
Ethoprop [Phosphorodithioic acid O-ethyl S,S-dipropyl ester]	13194-48-4
Ethyl dipropylthiocarbamate [EPTC]	759-94-4
Famphur	52-85-7
Fenarimol [.alpha.-(2-Chlorophenyl)-.alpha.-4-chlorophenyl)-5-pyrimidinemethanol]	60168-88-9

Fenbutatin oxide (hexakis(2-methyl-2-phenyl-propyl)distannoxane)	13356-08-6
Fenoxaprop ethyl [2-(4-((6-Chloro-2-benzoxazolylen)oxy) phenoxy)propanoic acid,ethyl ester]	66441-23-4
Fenoxycarb [2-(4-Phenoxyphenoxy) ethyl]carbamic acid ethyl ester]	72490-01-8
Fenpropathrin [2,2,3,3-Tetramethylcyclopropane carboxylic acid cyano(3-phenoxy-phenyl)methyl ester]	39515-41-8
Fenthion [O,O-Dimethyl O-[3-methyl-4-(methylthio)phenyl] ester, phosphorothioic acid]	55-38-9
Fenvalerate	51630-58-1
Ferbam [Tris(dimethylcarbamodithioato-S,S')iron]	14484-64-1
Fluazifop-butyl [2-[4-[[5-(Trifluoromethyl)-2-pyridinyl]oxy]-phenoxy]propanoic acid, butyl ester]	69806-50-4
Fluorine	7782-41-4
Fluorouracil (5-Fluorouracil)	51-21-8
Fluvalinate [N-[2-Chloro-4-(trifluoromethyl)phenyl]-DL-valine(+)-cyano (3-phenoxyphenyl)methyl ester]	69409-94-5
Folpet	133-07-3
Fomesafen [5-(2-Chloro-4-(trifluoromethyl)phenoxy)-N-methylsulfonyl)-2-nitrobenzamide]	72178-02-0
alpha-Hexachlorocyclohexane	319-84-6
n-Hexane	110-54-3
Hexazinone	51235-04-2
Hydramethylnon [Tetrahydro-5,5-dimethyl-2(1H)-pyrimidinone[3-[4- (trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl) phenyl]ethenyl]-2-propenylidene]hydrazone]	67485-29-4
Imazalil [1-[2-(2,4-Dichlorophenyl)-2-(2-propenyloxy)ethyl]-1H-imidazole]	35554-44-0
3-Iodo-2-propynyl butylcarbamate	55406-53-6
Iron pentacarbonyl	13463-40-6
Isodrin	465-73-6
Isofenphos [2-[[Ethoxyl[(1-methylethyl)amino] phosphinothioyl]oxy]benzoic acid 1-methylethyl ester]	25311-71-1
Lactofen [5-(2-Chloro-4-(trifluoromethyl)phenoxy)-2-nitro- 2 - ethoxy-1-methyl-2-oxoethyl ester]	77501-63-4
Linuron	330-55-2
Lithium carbonate	554-13-2
Malathion	121-75-5
Mecoprop	93-65-2
2-Mercaptobenzothiazole	149-30-4
Merphos	150-50-5
Metham sodium (Sodium methyldithiocarbamate)	137-42-8
Methazole [2-(3,4-Dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione]	20354-26-1
Methiocarb	2032-65-7
Methoxone (4-Chloro-2-methylphenoxy) acetic acid (MCPA))	94-74-6
Methoxone-sodium salt (4-chloro-2-methylphenoxy acetate sodium salt)	3653-48-3
Methyl isothiocyanate [Isothiocyanatomethane]	556-61-6

2-Methyllactonitrile	75-86-5
N-Methylolacrylamide	924-42-5
Methyl parathion	298-00-0
N-Methyl-2-pyrrolidone	872-50-4
Methyltrichlorosilane	75-79-6
Metiram	9006-42-2
Metribuzin	21087-64-9
Mevinphos	7786-34-7
Molinate (1H-Azepine-1-carbothioic acid, hexahydro-S-ethyl ester)	2212-67-1
Monuron	150-68-5
Myclobutanil [.alpha.- Butyl-.alpha.-(4-chlorophenyl)-1H-1,2,4-triazole-1-propanenitrile]	88671-89-0
Nabam	142-59-6
Naled	300-76-5
Nitrapyrin (2-Chloro-6-(trichloromethyl) pyridine)	1929-82-4
p-Nitroaniline	100-01-6
Norflurazon [4-Chloro-5-(methylamino)-2-[3-(trifluoromethyl)phenyl]-3(2H)-pyridazinone]	27314-13-2
Oryzalin [4-(Dipropylamino)-3,5-dinitrobenzene-sulfonamide]	19044-88-3
Oxydemeton methyl [S-(2-(ethylsulfinyl)ethyl) O,O-dimethyl ester phosphorothioic acid]	301-12-2
Oxydiazon [3-[2,4-Dichloro-5-(1-methylethoxy)phenyl]-5-(1,1-dimethylethyl)-1,3,4-oxadiazol-2(3H)-one]	19666-30-9
Oxyfluorfen	42874-03-3
Ozone	10028-15-6
Paraquat dichloride	1910-42-5
Pebulate [Butylethylcarbamothioic acid S-propyl ester]	1114-71-2
Pendimethalin [N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine]	40487-42-1
Pentobarbital sodium	57-33-0
Perchloromethyl mercaptan	594-42-3
Permethrin [3-(2,2-Dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid, (3-phenoxyphenyl)methyl ester]	52645-53-1
Phenanthrene	85-01-8
Phenothrin [2,2-Dimethyl-3-(2-methyl-1-propenyl) cyclopropanecarboxylic acid (3-phenoxyphenyl)methyl ester]	26002-80-2
1,2-Phenylenediamine	95-54-5
1,3-Phenylenediamine	108-45-2
1,2-Phenylenediamine dihydrochloride	615-28-1
1,4-Phenylenediamine dihydrochloride	624-18-0
Phenytoin	57-41-0
Phosphine	7803-51-2
Picloram	1918-02-1
Piperonyl butoxide	51-03-6
Pirimiphos methyl [O-(2-(Diethylamino)-6-methyl-4-pyrimidinyl)-O,O-dimethyl phosphorothioate]	29232-93-7

Potassium bromate	7758-01-2
Potassium dimethyldithiocarbamate	128-03-0
Potassium N-methyldithiocarbamate	137-41-7
Profenofos [O-(4-Bromo-2-chlorophenyl)-O-ethyl-S-propyl phosphorothioate]	41198-08-7
Prometryn [N,N'-Bis(1-methylethyl)-6-methylthio-1,3,5-triazine-2,4-diamine]	7287-19-6
Propachlor [2-Chloro-N-(1-methylethyl)-N-phenylacetamide]	1918-16-7
Propanil [N-(3,4-Dichlorophenyl) propanamide]	709-98-8
Propargite	2312-35-8
Propargyl alcohol	107-19-7
Propetamphos [3-[[(Ethylamino)methoxy-phosphinothioyl]oxy]-2-butenoic acid, 1-methylethyl ester]	31218-83-4
Propiconazole [1-[2-(2,4-Dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl]-methyl-1H-1,2,4,-triazole]	60207-90-1
Quizalofop-ethyl [2-[4-[(6-Chloro-2-quinoxalinyl)oxy]phenoxy] propanoic acid ethyl ester]	76578-14-8
Resmethrin [[5-(Phenylmethyl)-3-furanyl] methyl 2,2-dimethyl-3-(2-methyl-1-propenyl) cyclopropanecarboxylate]]	10453-86-8
Sethoxydim [2-[1-(Ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one]	74051-80-2
Simazine	122-34-9
Sodium azide	26628-22-8
Sodium dicamba [3,6-Dichloro-2-methoxybenzoic acid, sodium salt]	1982-69-0
Sodium dimethyldithiocarbamate	128-04-1
Sodium fluoroacetate	62-74-8
Sodium nitrite	7632-00-0
Sodium pentachlorophenate	131-52-2
Sodium o-phenylphenoxide	132-27-4
Sulfuryl fluoride [Vikane]	2699-79-8
Sulprofos [O-Ethyl O-[4-(methylthio)phenyl] phosphorodithioic acid S-propyl ester]	35400-43-2
Tebuthiuron [N-[5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl)-N,N'-dimethylurea]	34014-18-1
Temephos	3383-96-8
Terbacil [5-Chloro-3-(1,1-dimethylethyl)-6-methyl-2,4(1H,3H)-pyrimidinedione]	5902-51-2
1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)	354-11-0
1,1,2,2-Tetrachloro-1-fluoroetane (HCFC-121)	354-14-3
Tetracycline hydrochloride	64-75-5
Tetramethrin [2,2-Dimethyl-3-(2-methyl-1-propenyl) cyclopropanecarboxylic acid (1,3,4,5,6,7-hexahydro-1,3-dioxo-2H-isoindol-2-yl)methyl ester]	7696-12-0
Thiabendazole [2-(4-Thiazolyl)-1H-benzimidazole]	148-79-8
Thiobencarb [Carbamic acid, diethylthio-, s-(p-chlorobenzyl)]	28249-77-6
Thiodicarb	59669-26-0
Thiophanate ethyl [[1,2-Phenylenebis (iminocarbonothioyl)]biscarbamic acid diethyl ester]	23564-06-9

Thiophanate-methyl	23564-05-8
Thiosemicarbazide	79-19-6
Triadimefon [1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone]	43121-43-3
Triallate	2303-17-5
Tribenuron methyl [2-(((((4-Methoxy-6-methyl-1,3,5-triazin-2-yl)-methylamino)carbonyl)amino) sulfonyl)-, methyl ester]	101200-48-0
Tributyltin fluoride	1983-10-4
Tributyltin methacrylate	2155-70-6
S,S,S-Tributyltrithiophosphate (DEF)	78-48-8
Trichloroacetyl chloride	76-02-8
1,2,3-Trichloropropane	96-18-4
Triclopyr, triethylammonium salt	57213-69-1
Triethylamine	121-44-8
Triforine [N,N'-[1,4-Piperazinediyl-bis(2,2,2-trichloroethylidene)]bisformamide]	26644-46-2
Trimethylchlorosilane	75-77-4
2,3,5-Trimethylphenyl methylcarbamate	2655-15-4
Triphenyltin chloride	639-58-7
Triphenyltin hydroxide	76-87-9
Vinclozolin [3-(3,5-Dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidinedione]	50471-44-8

Chemical Category Name

Diisocyanates (This category includes only those chemicals listed below)

038661-72-2	1,3-Bis(methylisocyanate)cyclohexane
010347-54-3	1,4-Bis(methylisocyanate)cyclohexane
002556-36-7	1,4-Cyclohexane diisocyanate
134190-37-7	Diethyldiisocyanatobenzene
004128-73-8	4,4'-Diisocyanatodiphenyl ether
075790-87-3	2,4'-Diisocyanatodiphenyl sulfide
000091-93-0	3,3'-Dimethoxybenzidine-4,4'-diisocyanate
000091-97-4	3,3'-Dimethyl-4,4'-diphenylene diisocyanate
000139-25-3	3,3'-Dimethyldiphenylmethane-4,4'-diisocyanate
000822-06-0	Hexamethylene-1,6-diisocyanate
004098-71-9	Isophorone diisocyanate
075790-84-0	4-Methyldiphenylmethane-3,4-diisocyanate
005124-30-1	1,1-Methylene bis(4-isocyanatocyclohexane)
000101-68-8	Methylenebis(phenylisocyanate) (MDI)
003173-72-6	1,5-Naphthalene diisocyanate
000123-61-5	1,3-Phenylene diisocyanate
000104-49-4	1,4-Phenylene diisocyanate
009016-87-9	Polymeric diphenylmethane diisocyanate
016938-22-0	2,2,4-Trimethylhexamethylene diisocyanate
015646-96-5	2,4,4-Trimethylhexamethylene diisocyanate

Nicotine and salts
Nitrate Compounds (water dissociable; only when present in aqueous solution)
Polychlorinated alkanes (C_{10} to C_{13})

Includes those chemicals defined by the following formula:

$$C_xH_{2x-y+2}Cl_y$$

where $x = 10$ to 13;
$y = 3$ to 12; and
where the average chlorine content ranges from 40-70% with the limiting molecular formulas $C_{10}H_{19}Cl_3$ and $C_{13}H_{16}Cl_{12}$.

Polycyclic Aromatic Compounds (PACs) (This category includes only those chemicals listed below)

00056-55-3	Benz(a)anthracene
00218-01-9	Benzo(a)phenanthrene
00050-32-8	Benzo(a)pyrene
00205-99-2	Benzo(b)fluoranthene
00205-82-3	Benzo(j)fluoranthene
00207-08-9	Benzo(k)fluoranthene
00189-55-9	Benzo(rst)pentaphene
00226-36-8	Dibenz(a,h)acridine
00224-42-0	Dibenz(a,j)acridine
00053-70-3	Dibenzo(a,h)anthracene
05385-75-1	Dibenzo(a,e)fluoranthene
00192-65-4	Dibenzo(a,e)pyrene
00189-64-0	Dibenzo(a,h)pyrene
00191-30-0	Dibenzo(a,l)pyrene
00194-59-2	7H-Dibenzo(c,g)carbazole
00057-97-6	7,12-Dimethylbenz(a)anthracene
00193-39-5	Indeno[1,2,3-cd]pyrene
03697-24-3	5-Methylchrysene
05522-43-0	1-Nitropyrene

Strychnine and salts

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Appendix 4

Exponential Notation

APPENDIX 4

EXPONENTIAL NUMBERS

Exponential numbers provide a convenient mechanism to describe very large or very small numbers. The format for the number is a simple number followed by a base 10 multiplier. For example, "2.0E+6" represents two times ten raised to the sixth power, i.e., two million. "2.0E+0" represents two times ten raised to the zero power which is simply two. (Any number raised to the zero power is unity.) "2.0E-2" represents two times ten raised to the negative two power which is the same as two percent or two hundredths.

EXPONENTIAL FORM	DECIMAL FORM
1.0E+6	1,000,000
1.0E+5	100,000
1.0E+4	10,000
1.0E+3	1,000
1.0E+2	100
1.0E+1	10
1.0E+0	1
1.0E-1	0.1
1.0E-2	0.01
1.0E-3	0.001
1.0E-4	0.0001
1.0E-5	0.00001
1.0E-6	0.000001

Appendix 5

1994 Form R Sample Form

(Source: *Toxic Chemical Release Inventory Reporting Form R and Instruction*, EPA 745-K-95-051)

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FORM R TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

WHERE TO SEND COMPLETED FORMS:

1. EPCRA Reporting Center
P.O. Box 3348
Merrifield, VA 22116-3348
ATTN: TOXIC CHEMICAL RELEASE INVENTORY

2. APPROPRIATE STATE OFFICE
(See instructions in Appendix F)

Enter "X" here if this is a revision ☐

For EPA use only

IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR

19 ____

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 3 trade secret?

☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2; Go to Section 3)

2.2 If yes in 2.1, is this copy: ☐ Sanitized ☐ Unsanitized

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official

Signature

Date Signed

SECTION 4. FACILITY IDENTIFICATION

4.1

Facility or Establishment Name

TRI Facility ID Number

Street Address

City

County

State

Zip Code

Mailing Address (if different from street address)

City

State

Zip Code

PUT LABEL HERE

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EPA FORM R

PART I. FACILITY IDENTIFICATION INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 4. FACILITY IDENTIFICATION (Continued)

4.2	This report contains information for: (Important: check a or b; check c if applicable)	a. ☐ An entire facility	b. ☐ Part of a facility	c. ☐ A Federal facility			
4.3	Technical Contact	Name				Telephone Number (include area code)	
4.4	Public Contact	Name				Telephone Number (include area code)	
4.5	SIC Code (4-digit)	a.	b.	c.	d.	e.	f.
4.6	Latitude and Longitude	Latitude			Longitude		
		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

4.7	Dun & Bradstreet Number(s) (9 digits)	a. b.
4.8	EPA Identification Number(s) (RCRA I.D. No.) (12 characters)	a. b.
4.9	Facility NPDES Permit Number(s) (9 characters)	a. b.
4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)	a. b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	☐ NA
5.2	Parent Company's Dun & Bradstreet Number	☐ NA (9 digits)

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PART II. CHEMICAL-SPECIFIC INFORMATION

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you complete Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes." Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you complete Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

3.1	**Manufacture the toxic chemical:**	a. ☐ Produce b. ☐ Import	If produce or import: c. ☐ For on-site use/processing d. ☐ For sale/distribution e. ☐ As a byproduct f. ☐ As an impurity
3.2	**Process the toxic chemical:**	a. ☐ As a reactant b. ☐ As a formulation component	c. ☐ As an article component d. ☐ Repackaging
3.3	**Otherwise use the toxic chemical:**	a. ☐ As a chemical processing aid b. ☐ As a manufacturing aid	c. ☐ Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 5. RELEASES OF THE TOXIC CHEMICAL TO THE ENVIRONMENT ON-SITE

			A. Total Release (pounds/ year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	☐ NA			
5.2	Stack or point air emissions	☐ NA			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
5.3.1	Stream or Water Body Name				
5.3.2	Stream or Water Body Name				
5.3.3	Stream or Water Body Name				
5.4	Underground injections on-site	☐ NA			
5.5	Releases to land on-site				
5.5.1	Landfill	☐ NA			
5.5.2	Land treatment/ application farming	☐ NA			
5.5.3	Surface impoundment	☐ NA			
5.5.4	Other disposal	☐ NA			

☐ Check here only if additional Section 5.3 information is provided on page 5 of this form.

Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

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EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

SECTION 5.3 ADDITIONAL INFORMATION ON RELEASES OF THE TOXIC CHEMICAL TO THE ENVIRONMENT ON-SITE

5.3 Discharges to receiving streams or water bodies (enter one name per box)	A. Total Release (pounds/year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.3.__ Stream or Water Body Name			
5.3.__ Stream or Water Body Name			
5.3.__ Stream or Water Body Name			

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTW)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1 Total Transfers (pounds/year) (enter range code or estimate)	6.1.A.2 Basis of Estimate (enter code)

6.1.B POTW Name and Location Information

6.1.B.__ POTW Name	6.1.B.__ POTW Name
Street Address	Street Address
City / County	City / County
State / Zip Code	State / Zip Code

If additional pages of Part II, Sections 5.3 and/or 6.1 are attached, indicate the total number of pages in this box [ ] and indicate which Part II, Sections 5.3/6.1 page this is, here. [ ]

(example: 1, 2, 3, etc.)

Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds

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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. Off-site EPA Identification Number (RCRA ID No.)

Off-Site Location Name

Street Address

City | County

State | Zip Code | Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year) (enter range code or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. Off-site EPA Identification Number (RCRA ID No.)

Off-Site Location Name

Street Address

City | County

State | Zip Code | Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year) (enter range code or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

If additional pages of Part II, Section 6.2 are attached, indicate the total number of pages in this box ☐ and indicate which Part II, Section 6.2 page this is, here. ☐ (example: 1, 2, 3, etc.)

Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ **Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.**

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data?
7A.1a	7A.1b: 1 2 3 4 5 6 7 8	7A.1c	7A.1d	7A.1e
			%	Yes ☐ No ☐
7A.2a	7A.2b: 1 2 3 4 5 6 7 8	7A.2c	7A.2d	7A.2e
			%	Yes ☐ No ☐
7A.3a	7A.3b: 1 2 3 4 5 6 7 8	7A.3c	7A.3d	7A.3e
			%	Yes ☐ No ☐
7A.4a	7A.4b: 1 2 3 4 5 6 7 8	7A.4c	7A.4d	7A.4e
			%	Yes ☐ No ☐
7A.5a	7A.5b: 1 2 3 4 5 6 7 8	7A.5c	7A.5d	7A.5e
			%	Yes ☐ No ☐

If additional copies of page 7 are attached, indicate the total number of pages in this box ☐ and indicate which page 7 this is, here. ☐ (example: 1, 2, 3, etc.)

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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Chemical, Category, or Generic Name

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

	All quantity estimates can be reported using up to two significant figures.	Column A Prior Year (pounds/year)	Column B Current Reporting Year (pounds/year)	Column C Following Year (pounds/year)	Column D Second Following Year (pounds/year)
8.1	Quantity released *				
8.2	Quantity used for energy recovery on-site				
8.3	Quantity used for energy recovery off-site				
8.4	Quantity recycled on-site				
8.5	Quantity recycled off-site				
8.6	Quantity treated on-site				
8.7	Quantity treated off-site				
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)				
8.9	Production ratio or activity index				

8.10 Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1		a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

8.11 Is additional optional information on source reduction, recycling, or pollution control activities included with this report? (Check one box) YES ☐ NO ☐

* Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated on-site or off-site.

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