



United States
Environmental Protection
Agency

Office of Information
Analysis and Access

March 2001

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT SECTION 313

EPCRA/TRI TRAINING MATERIALS

Reporting Year 2000
Spring 2001

TWO-DAY WORKSHOP

Module 1: TRI Overview

**RY2000 EPCRA/TRI Training for All Industries
Falls Church, VA
March 7 – 8, 2001**

Wednesday, March 7

Morning

7:30 - 8:00 Registration

8:00 - 8:10 Introduction - EPCRA/TRI Regional Representative
Welcoming remarks
Overview of Regional technical assistance

**8:10 – 9:10 A. Toxics Release Inventory Reporting Requirements (EPCRA Section 313) –
Robert Costa, SAIC**

This presentation provides an overview of the TRI reporting criteria, focusing on threshold determinations and key terms (e.g., facility, manufacture, process, otherwise use). The presentation also provides a general overview of the chemical list, including chemical categories and qualifiers.

9:15 – 10:00 B. Section 313 Reporting Exemptions – Jeff Kohn, SAIC

This presentation addresses reporting exemptions (e.g., *de minimis*, article, structural component, routine janitorial/facility maintenance, personal use, laboratory activity, motor vehicle maintenance, intake air and water, coal extraction activity, metal mining overburden).

10:00 – 10:15 Break

10:15 – 11:00 C. Determining Thresholds – Robert Costa, SAIC

This session discusses methods for identifying EPCRA Section 313 chemicals, compiling usage information, and organizing the information to facilitate making threshold determinations.

- Exercise #1 - Identifying EPCRA Section 313 chemicals using MSDSs

11:00 – 12:00 D. Exercise #2: Threshold Determinations – Jeff Kohn, SAIC

A comprehensive workshop based on a mock facility; this exercise reinforces the morning's discussion of threshold determinations and reporting exemptions. Course participants will identify the EPCRA Section 313 chemicals used at the facility, complete threshold determination worksheets and perform threshold determinations.

12:00 – 1:00 LUNCH

Afternoon

1:00 – 2:30 E. TRI Release and Other Waste Management Reporting – Robert Costa, SAIC

This presentation focuses on a coordinated approach for collecting the information necessary for accurate release calculations and determining off-site transfer activities.

2:30 – 2:45 Break

2:45 – 3:45 F. Overview of Pollution Prevention Reporting – Jeff Kohn, SAIC

This presentation provides an overview of the PPA, explains how that law affects EPCRA Section 313 reporting, and reviews the data elements in Part II, section 8 of Form R.

- Exercise #3: Identifying PPA waste streams

3:45 – 4:00 G. Form A Submission – Jeff Kohn, SAIC

This presentation provides additional information on submitting a Form A certification statement.

Thursday, March 8

Morning

8:00 – 8:45 H. Reporting Requirements for Persistent, Bioaccumulative, and Toxic (PBT) Chemicals: An Overview – Robert Costa, SAIC

This session reviews the new persistent, bioaccumulative, and toxic chemicals (PBT) rulemaking. This presentation will also overview which exemptions will not apply for PBTs. This presentation will introduce the chemicals subject to the new PBT thresholds, and discusses in what types of processes and mixtures PBT chemicals will be found, how to estimate the quantities of PBT chemicals, and where to go for additional information.

8:45 – 9:15 I. Polycyclic Aromatic Compounds (PACs) and Benzo(g,h,i)perylene – Jeff Kohn, SAIC

- Exercise #4: Calculating thresholds for PACs and benzo(g,h,i)perylene

9:15 – 9:45 J. Dioxin and Dioxin-like Compounds (DLC) – Jeff Kohn, SAIC

9:45 – 10:15 K. Mercury and Mercury Compounds – Robert Costa, SAIC

10:15 – 10:30 L. Pesticides – Robert Costa, SAIC

10:30 – 11:00 M. Other PBT Chemicals – Robert Costa, SAIC

11:00 – 12:00 LUNCH

Afternoon

12:00 – 12:30 N. TRI Update – Robert Costa, SAIC

This presentation focuses on TRI form and procedural changes for experienced TRI filers. Descriptions include changes to the Form R/Form A, the TRI Forms and Instructions document, the Automated Form R Reporting Software (ATRS), and submission deadlines.

12:30 – 1:30 O. EPCRA Section 313 List of Toxic Chemicals – Jeff Kohn, SAIC

This presentation provides a review of the EPCRA Section 313 chemical list and interpretive guidance issues.

- Chemical list additions, deletions, and modifications
- Reporting guidance: Ammonia, Nitrate Compounds, Acid Aerosols (HCl, H₂SO₄)
- Exercise #5 - Calculating releases of ammonia and nitrate compounds

1:30 – 1:45 Break

1:45 – 2:15 P. Acid Aerosol and Fuel Combustion Reporting – Robert Costa, SAIC

This session focuses on threshold and release determination calculations for acid aerosols and fuel combustion. In particular, this session will focus on coincidental manufacture of chemicals in combustion processes, including metal compounds and acid aerosols. Aerosol discussions will emphasize situations where aerosols could be produced from processing solutions.

Thursday, March 8 - Continued

2:15 – 2:45 Q. Metal and Metal Compounds Reporting – Jeff Kohn, SAIC

This presentation focuses on reportable metals, and how they are commonly counted for threshold and release and other waste management purposes. The session will focus on the use of metal for products distributed into commerce (processing), and uses of metal on-site, such as to build new tanks and equipment (otherwise use). This presentation also describes how the article exemption applies to metal containing materials and wastes.

2:45 – 3:00 Break

3:00 – 3:15 R. Maintenance Chemicals and Otherwise Use Activities – Robert Costa, SAIC

This presentation provides a review of chemicals used to maintain facility operations. Often chemicals are overlooked that are not used directly in facility operations, such as chemicals used to clean equipment. This presentation is designed to provide attendees with ideas and tools for accounting for these chemicals, and how exemptions may or may not apply depending on their use.

3:15 – 4:00 S. Getting It Right: Avoiding Common Errors – Jeff Kohn, SAIC

This session will review common errors in TRI reporting. As appropriate, EPA Regional and/or State representatives will discuss their TRI programs and technical assistance resources, including enforcement and compliance assurance activities.

- Exercise #6 - TRI Knowledge Quiz

4:00 – 4:30 T. Burning Questions and Closing Remarks – Jeff Kohn, SAIC

This concluding session will address any outstanding issues that developed during the training seminar. Sources for additional guidance on TRI reporting will also be identified.

- Remaining issues; questions and answers
- EPA guidance documents
- Hotlines, bulletin boards, industry groups, trade associations

TRAINING DISCLAIMER

This document was developed for the sole purpose of helping potential reporters understand and comply with the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA). Nothing in this document is intended to independently alter, supplement, or revoke the statutory and/or regulatory requirements imposed by EPCRA section 313 and the applicable regulations at 40 CFR 372, et seq. Although these training materials provide an overview of the section 313 reporting requirements, facilities should consult the statute and regulations when developing threshold determinations and calculating releases and other waste management amounts. Facilities should be aware that EPA also provides guidance documents containing both sector specific guidance and guidance on specific elements of the EPCRA section 313 program. Covered facilities are encouraged to consult these guidance documents for additional assistance. Facilities may also receive specifically for Reporting Year 2000, for reports due on July 1, 2001. Facilities should be aware that EPA may promulgate regulatory changes to the EPCRA section 313 program that may alter reporting requirements for future reporting years.

TOXICS RELEASE INVENTORY REPORTING REQUIREMENTS (EPCRA SECTION 313)

WHO MUST REPORT?

■ Facilities (Private- and Public-sector)

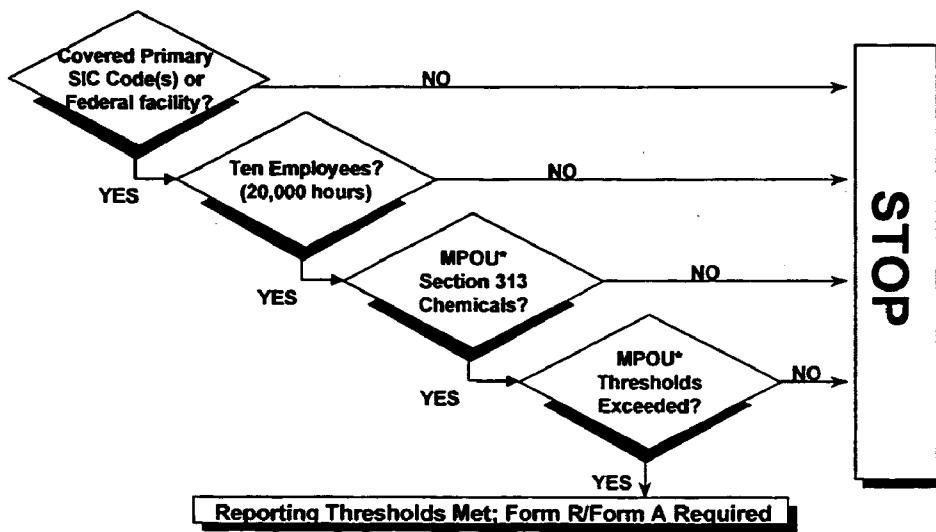
- In covered primary SIC code(s) or Federal facilities; and
- With 10 or more full-time employees (equivalent of 20,000 hours per year); and
- That exceed manufacture, or process, or otherwise use thresholds for each Section 313 chemical

WHAT TO REPORT?

- File a TRI report for each Section 313 chemical exceeding an activity threshold
- Submit to U.S. EPA, and either designated state officials or designated tribal office by July 1st for preceding calendar year's activities
 - July 1, 2001 (January 1 - December 31, 2000 activities)

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TRI REPORTING PROCESS



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COVERED SIC CODES

Industrial Sector	Primary SIC Code
Manufacturing	20-39
Metal mining	10 (except 1011, 1081, and 1094)
Coal mining	12 (except 1241)
Electrical utilities	4911, 4931, and 4939, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce
Treatment, Storage, and Disposal facilities	4953, limited to RCRA Subtitle C permitted or interim status facilities
Solvent recovery services	7389, limited to facilities primarily engaged in solvent recovery services on a contract or fee basis
Chemical distributors	5169
Petroleum bulk terminals	5171

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FEDERAL FACILITIES

■ Federal facilities (covered by Executive Order 13148)

- Owned or operated by Executive Branch agencies
 - » No restrictions based on SIC code
 - » Includes federal prisons, national parks, federal hospitals
- With 10 or more full-time employees (equivalent of 20,000 hours per year)
- That exceed manufacture, or process, or otherwise use thresholds
- Agency responsible for reporting on activities at Federal facilities that are conducted by, for, or in support of the agency

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SIC CODES

- **Section 313 subjects facilities to reporting based on classification of primary activities in the Standard Industrial Classification (SIC) system (§372.22)**
- **On April 9, 1997 (62 FR 17288), the North American Industry Classification (NAIC) System was implemented**
- **SIC codes are to be used until EPA transitions to new NAIC system in future reporting years**
- **An OMB crosswalk exists between the SIC and new NAIC codes (see 62 FR 172188)**

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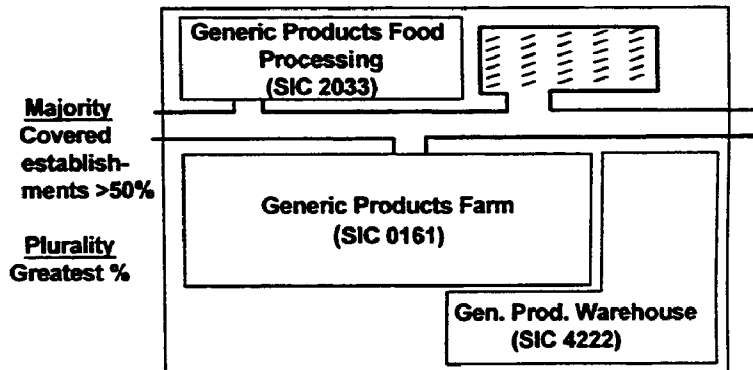
DEFINITION OF "FACILITY"

- **"Facility - all buildings, equipment, structures, and other stationary items which are located on a single site or contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person)." (EPCRA §329(4))**
- **Establishment - unique and separate economic unit of a "facility" (§372.3)**
- **Auxiliary facility - primarily supports a covered establishment's activities at another facility**

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MULTI-ESTABLISHMENT FACILITY

Three separate establishments located on contiguous/adjacent property owned by same person(s), is one facility under EPCRA (§372.22(b))

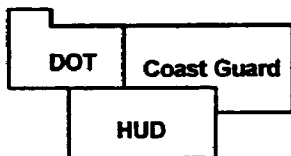


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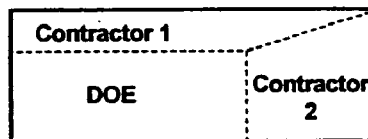
MULTI-ESTABLISHMENT FACILITY

■ Determining how facilities report

- Federal facilities and federal contractors (GOCOs)



Ex. 1: Two separate reporting facilities (HUD and DOT including Coast Guard)



Ex. 2: One reporting facility (DOE)

A-10

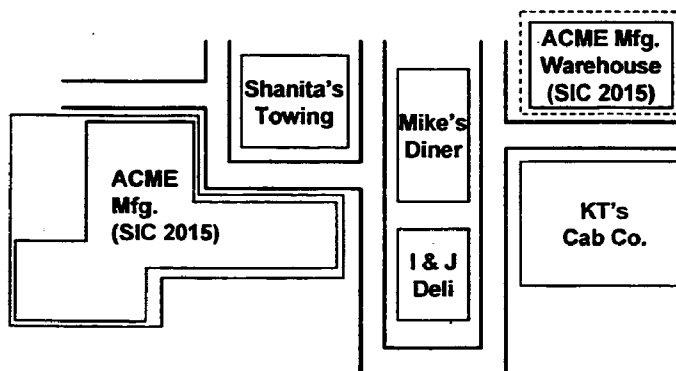
AUXILIARY FACILITY

- Non-contiguous and non-adjacent to a covered establishment
- Primary function is to support a covered establishment's activities at another facility (e.g., warehouses, laboratories)
- Assumes SIC code of covered establishment for reporting purposes
- Employee and chemical activity threshold determinations are separate!

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AUXILIARY FACILITY

ACME Mfg. Facilities
(Warehouse is auxiliary facility of ACME Mfg.)



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EMPLOYEE THRESHOLD

- **10 full-time employees (20,000 hours) (§§372.3 and 372.22(a))**
 - Worked at or directly for facility
 - Includes operational staff, administrative staff, contractors, dedicated sales staff, company drivers, off-site direct corporate support
 - Does NOT include contract drivers or janitorial contractors
- **Determinations based on available time management systems/data**

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THRESHOLDS TRIGGERING EPCRA SECTION 313 REPORTING

- **Section 313 chemicals that are listed as persistent, bioaccumulative, and toxic (PBT) are subject to separate and lower thresholds (§372.28)**
- **A facility meeting the SIC code (or Federal facility) and employee criteria must file a TRI report for a non-PBT Section 313 chemical if the facility (§372.25):**
 - Manufactured (including imported) more than 25,000 pounds per year, or
 - Processed more than 25,000 pounds per year, or
 - Otherwise used more than 10,000 pounds per year
- **Activity thresholds are calculated independently**
- **Threshold calculations are based on cumulative quantities per Section 313 chemical over the reporting year**

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THRESHOLDS TRIGGERING EPCRA SECTION 313 REPORTING

- If a facility manufactures, processes, or otherwise uses any chemicals that are listed as persistent, bioaccumulative, and toxic (PBT), the threshold quantity is one of the following per toxic chemical or category per year (§372.28):

Threshold Level	Type of PBT Chemical
100 pounds	Persistent and bioaccumulative
10 pounds	Highly persistent and highly bioaccumulative
0.1 grams	Dioxin and dioxin-like compounds

A-15

CATEGORIES OF MANUFACTURING ACTIVITIES

- **Manufacturing (§372.3) - generating a Section 313 chemical**
 - Intentionally producing chemicals for:
 - » Sale
 - » Distribution
 - » On-site use or processing (e.g., intermediates)
 - Coincidentally producing chemicals as impurities or byproducts:
 - » At any point at the facility, including waste treatment and fuel combustion
 - Importing
 - » "Cause" to be imported

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CATEGORIES OF PROCESSING ACTIVITIES

■ Processing (§372.3) - preparation of a Section 313 chemical for distribution in commerce

- Using as a reactant to manufacture another substance or product
- Adding as a formulation component
- Incorporating as an article component
- Repackaging for distribution
 - » Including quantities sent off-site for recycling
- As an impurity

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REPACKAGING AS A PROCESSING ACTIVITY

■ Repackaging a Section 313 chemical for distribution in commerce is considered processing

- Repackaging includes transfer:
 - » From container to tanker truck and visa versa
 - » Between similar size containers
 - » Via pipeline to/from a tank
- Repackaging does not include:
 - » Sampling without repackaging
 - » Re-labeling

■ Repackaging without distribution into commerce is not considered processing

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OTHERWISE USE

- **Otherwise using (§372.3) - includes most activities that are not manufacturing or processing**

- **Examples**

- » **Chemical processing aid (e.g., solvents)**
- » **Manufacturing aid (e.g., lubricants, refrigerants)**
- » **Ancillary activities (e.g., chemicals used to remediate wastes)**

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OTHERWISE USE (CONTINUED)

- **Otherwise use of a Section 313 chemical also includes on-site disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction if:**
 - **Section 313 chemical was received from off-site for the purposes of further waste management, or**
 - **Section 313 chemical was manufactured as a result of waste management activities on materials received from off-site for the purpose of further waste management**
- **Waste management activities include recycling, combustion for energy recovery, treatment for destruction, waste stabilization and release (including disposal)**

A-20

CALCULATING ACTIVITY THRESHOLDS

■ Calculate total amount of Section 313 chemical to a threshold activity

- **Example:**

- » A plant uses MEK to manufacture liquid industrial adhesive for distribution in commerce. The plant adds 27,000 pounds of MEK to the liquid adhesive-making operation during the reporting year, but 3,000 pounds are volatilized during the operation
- » 27,000 pounds of MEK is processed, reporting required

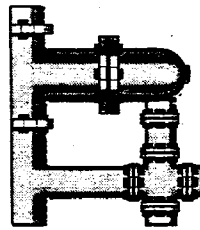
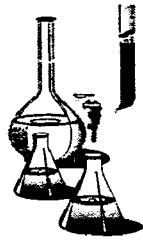
A-21

CALCULATING ACTIVITY THRESHOLDS

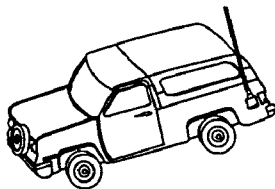
■ Activities that, alone, do NOT constitute an activity threshold

- Storage
- Remediation of on-site contamination
- Re-labeling without repackaging
- Direct reuse onsite
- On-site recycling
- Transfers sent off-site for further waste management (not including recycling)

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EPCRA SECTION 313 REPORTING EXEMPTIONS



SECTION 313 EXEMPTIONS

- Designed to reduce the burden of reporting associated with small or ancillary chemical uses
- If an exemption applies, then the amount of a Section 313 chemical subject to the exemption does not have to be included in:
 - Threshold determinations
 - Release and other waste management reporting
 - Supplier notification
- Recognize that exemptions only apply in certain limited circumstances

SECTION 313 EXEMPTIONS

■ Types of exemptions (§372.38)

- *De minimis*
- Articles
- Laboratory activities
- Otherwise use exemptions
 - » Motor vehicle maintenance
 - » Routine janitorial or facility grounds maintenance
 - » Structural components
- Personal use
- Intake water and air
- Mining (extraction activities and overburden)

B-3

DE MINIMIS EXEMPTION

■ The quantity of a non-PBT Section 313 chemical in a mixture or other trade name product is eligible for the exemption if the chemical is:

- Any non-PBT Section 313 chemicals present at a concentration of less than 1% by weight (§372.38(a))
- or
- An OSHA-defined non-PBT carcinogen present at a concentration of less than 0.1% by weight

B-4

DE MINIMIS EXEMPTION

How It Works

■ ***De minimis* exemption can apply to non-PBT chemicals:**

- In mixtures or other trade name products processed or otherwise used
- Only two manufacturing activities:
 - » Coincidentally manufactured as impurities that remain in products
 - » Imported in mixtures or other trade name products

B-5

DE MINIMIS EXEMPTION

How It Works

■ ***De minimis* exemption does not apply to:**

- Manufacturing chemicals (in most cases)
 - » Manufacturing chemicals as by-products
 - » Coincidentally manufacturing chemicals
 - As by-products of waste treatment or fuel combustion
- Section 313 chemicals listed as persistent, bioaccumulative, and toxic (PBT) (except for supplier notification)

B-6

DE MINIMIS EXEMPTION

How It Works

■ *De minimis* exemption does not apply to:

- Wastes and waste streams, from non-exempt sources, that are processed or otherwise used
 - » Wastes received from off-site for purposes of on-site incineration
- Releases and other waste management activities from mixtures or other trade name products that are not associated with a processing or otherwise use activity
 - » Material storage not associated with processing or otherwise use activities

B-7

DE MINIMIS EXEMPTION

How It Works

- *De minimis* concentration for toluene is 1.0% (not an OSHA carcinogen)

Cleaning
Mixture
0.5% Toluene
(exempt)

Raw Material
Mixture
90% Toluene
(not exempt)



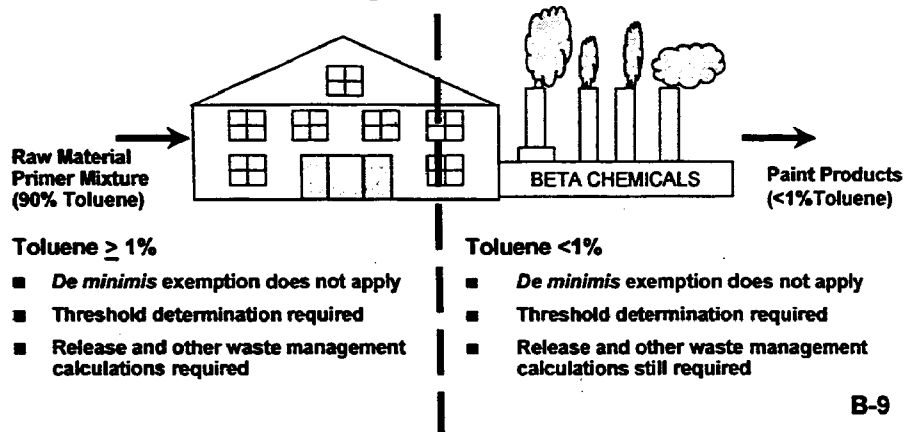
- Toluene in cleaning mixture is below *de minimis* concentration and is eligible for the exemption

B-8

DE MINIMIS EXEMPTION

How It Works

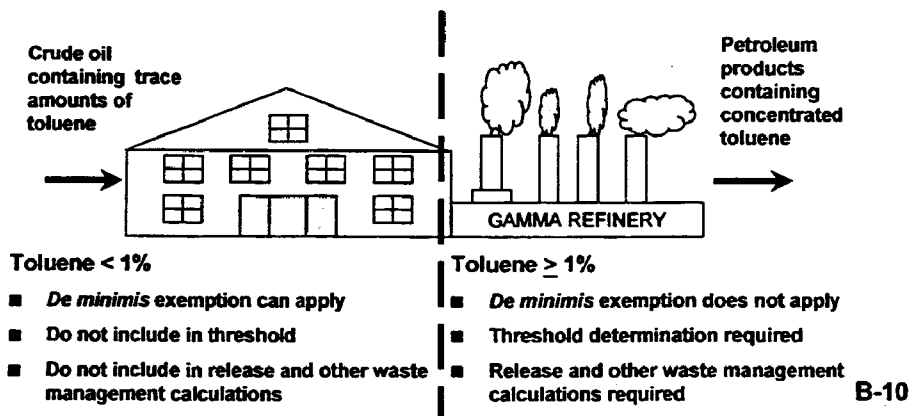
- Processing a non-PBT Section 313 chemical in a mixture to below the *de minimis* concentration does **not** exempt the chemical from threshold determinations and release and other waste management calculations



DE MINIMIS EXEMPTION

How It Works

- Processing a non-PBT Section 313 chemical in a mixture to above the *de minimis* concentration triggers threshold determinations and release and other waste management calculation requirements



ARTICLES EXEMPTION

- **“Article” is defined (§372.38(b)) as an item that is already manufactured and:**
 - **Is formed into a specific shape or design during manufacture; and**
 - **Has end-use functions dependent in whole or in part on its shape or design during end-use; and**
 - **Does not release a Section 313 chemical under normal processing or otherwise use conditions at a facility**
- **The articles exemption does not apply to the manufacture of articles**

B-11

ARTICLES EXEMPTION

How It Works

- **Releases of a Section 313 chemical from an article may negate the exemption. To maintain the article status, total releases from all like items must be:**
 - **In a recognizable form; or**
 - **Recycled, directly reused; or**
 - **0.5 pounds or less (may be rounded down to zero)**
- **If more than 0.5 pounds of a Section 313 chemical are released from all like items in a non-recognizable form and are not recycled or directly reused, none of the items meet the articles exemption**

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ARTICLES EXEMPTION

Examples

- **Wire is cut to specified lengths. Wastes include off-spec cuts and dust**
 - **Generation of off-spec cuts that are recognizable as articles will not, by itself, negate the article status**
 - **Dust and off-spec cuts not recognizable as articles, with greater than 0.5 pounds of a Section 313 chemical released, and not recycled or directly reused, negate the article status**
- **Fluorescent light bulbs are installed containing mercury. The used bulbs are crushed in an enclosed container prior to recycling**
 - **Crushing bulbs prior to disposal is not considered release during use; exemption is not negated**

B-13

ARTICLES EXEMPTION

Examples

- **Pipe is cut to specified lengths. Wastes include off-spec cuts and dust**
 - **Facility estimates that from all uses of the same type of pipe over the reporting year, a total of 2 pounds of chromium releases and 0.3 pounds of nickel releases occur**
 - **Because total chromium releases are greater than 0.5 pounds over the reporting year, the articles exemption is negated for all uses of the pipe including both the chromium and nickel in the pipe (even though total nickel releases were less than 0.5 pounds)**

B-14

LABORATORY ACTIVITIES EXEMPTION

- **Section 313 chemicals manufactured, processed, or otherwise used in certain laboratory activities, performed under the supervision of a technically qualified individual, may be eligible for the exemption (§372.38(d))**
- **Activity must occur in a laboratory to be exempt**
- **Laboratories, themselves, are not exempt**

B-15

LABORATORY ACTIVITIES EXEMPTION

- **Definition of technically qualified individual (§720.3(ee))**
 - **Capable of understanding the health and environmental risks associated with the chemical substance which is used under his or her supervision because of education, training, or experience, or a combination of these factors;**
 - **Responsible for enforcing appropriate methods of conducting scientific experimentation, analysis, or chemical research to minimize such risks; and**
 - **Responsible for the safety assessments and clearances related to the procurement, storage, use, and disposal of the chemical substance as may be appropriate or required within the scope of conducting a research and development activity.**

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LABORATORY ACTIVITIES EXEMPTION

How It Works

- **Section 313 chemicals manufactured, processed, or otherwise used in these laboratory activities are eligible for the exemption**

- **Sampling and analysis**
- **Quality assurance**
- **Quality control**

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LABORATORY ACTIVITIES EXEMPTION

How It Works

- **Section 313 chemicals manufactured, processed, or otherwise used in these laboratory activities are NOT exempt**

- **Any activities conducted outside laboratories**
- **Specialty chemical production**
- **Pilot-scale plant operations**
- **Support services**
- **Photo processing**
- **Equipment maintenance/cleaning**

B-18

MOTOR VEHICLE MAINTENANCE EXEMPTION

- **Section 313 chemicals otherwise used to maintain motor vehicles operated by the facility are eligible for the exemption (§372.38(c)(4))**
- **Examples of motor vehicles eligible for the exemption include cars, trucks, airplanes, and forklifts**
- **Examples of exempt motor vehicle maintenance:**
 - **Body repairs**
 - **Parts washing and plating**
 - **Fueling and adding other fluids (e.g., ethylene glycol)**

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ROUTINE JANITORIAL OR FACILITY GROUNDS MAINTENANCE EXEMPTION

- **Section 313 chemicals contained in products otherwise used for non-process related routine janitorial or facility grounds maintenance are eligible for the exemption (§372.38(c)(2))**
 - **Phenol in bathroom disinfectants**
 - **Pesticides in lawn care products**
- **Section 313 chemicals otherwise used in process-related activities are not exempt**
 - **Facility equipment maintenance**
 - **Cleaning or maintenance activities that are integral to the production process of the facility**

B-20

STRUCTURAL COMPONENT EXEMPTION

- **The otherwise use of Section 313 chemicals, that are part of structural components of a facility, are eligible for the exemption provided the structure is not process related (§372.38(c)(1))**
 - **Copper in pipe used in construction of employees' bathroom facilities**
 - **Metals, pigments, and solvents in paint applied to facility structure**

B-21

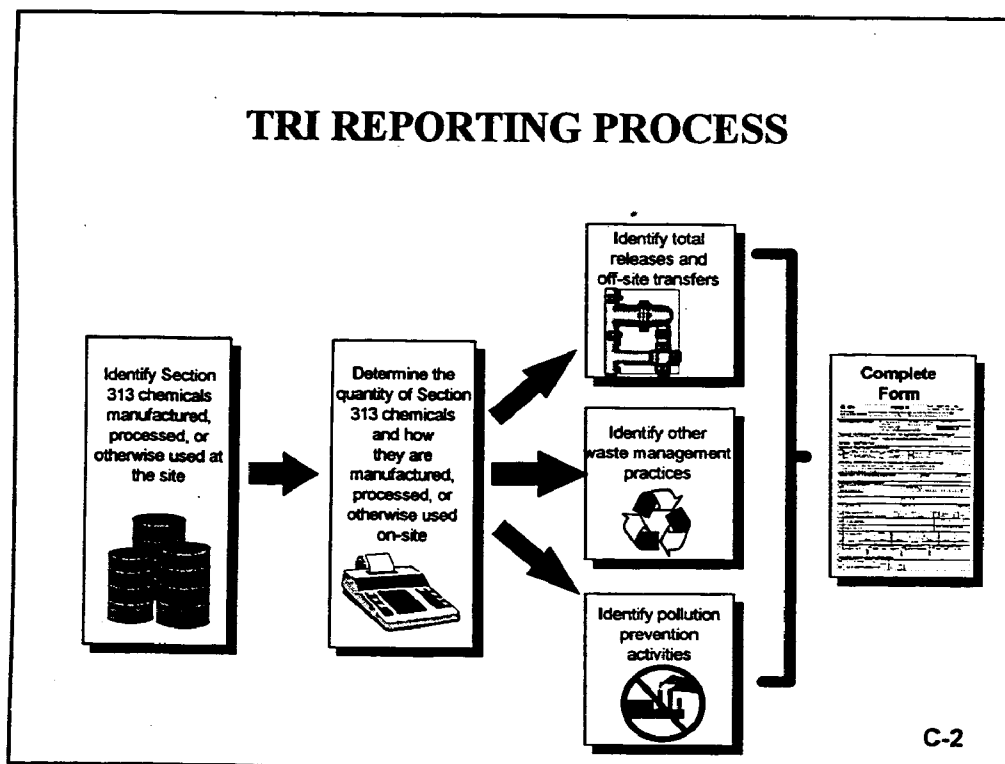
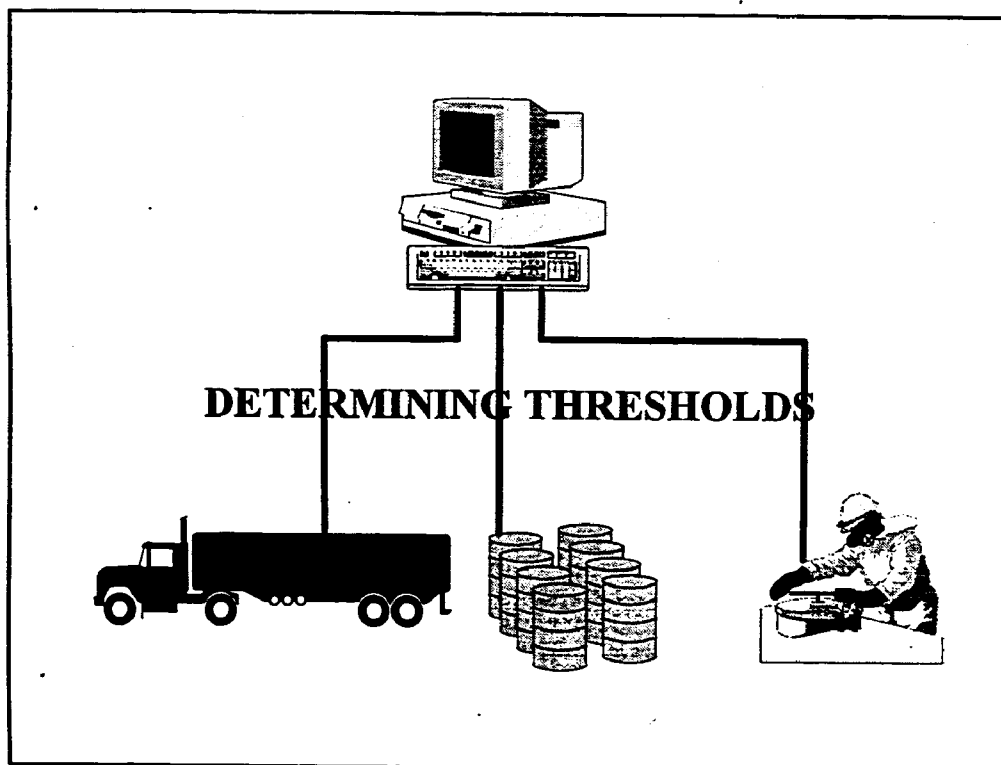
OTHER EPCRA SECTION 313 EXEMPTIONS

- **Section 313 chemicals contained in non-process related items for employee personal use (§372.38(c)(3))**
 - **HCFC-22 in air conditioners used solely for employee comfort**
 - **Chlorine used to treat on-site potable water**
 - **Phenol in a facility medical dispensary**
- **Section 313 chemicals found in intake water (e.g., process water and non-contact cooling water) and air (e.g., used as compressed air) (§372.38(c)(5))**

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SIC CODE-SPECIFIC EXEMPTIONS

- **SIC Code 12: Coal mining extraction activities are exempt from threshold determinations and release reporting (§372.38(g))**
 - **Coal extraction: the physical removal or exposure of ore, coal, minerals, waste rock, or overburden prior to beneficiation, and encompasses all extraction-related activities prior to beneficiation (§372.3)**
- **SIC Code 10: Chemicals in metal mining overburden that are processed or otherwise used are specifically exempt from TRI reporting (§372.38(h))**
 - **Overburden: unconsolidated material that overlies a deposit of useful materials or ores (§372.3)**



DETERMINING THRESHOLDS

- Identify what Section 313 chemicals are handled on-site
- Identify concentrations of Section 313 chemicals
- Collect data and calculate quantities towards each threshold

C-3

DETERMINING THRESHOLDS

Identify Chemicals and Concentrations:

MSDS
Specifications
Waste Profiles
Process Knowledge
Other References (AP-42,
Merck Index)
Supplier Notification



Collect Data to Calculate Thresholds:

Inventory Records
Throughput/Production Data
Purchase Records
EPCRA or Other Env. Reports
Ask the User
Call the Vendor

C-4

SECTION 313 CHEMICALS AND CHEMICAL CATEGORIES

- Original list developed from Maryland "High Production Volume" and New Jersey "Right to Know" chemical lists
- Current list contains over 600 individual chemicals and chemical categories (See Table II of the EPA's *TRI Reporting Forms and Instructions* document)
- Petition process to add or delete chemicals or forms of chemicals (EPCRA Section 313(e))

C-5

SECTION 313 CHEMICAL QUALIFIERS

- Qualifiers - Listed chemicals with parenthetical qualifiers subject to TRI reporting only if manufactured, processed, or otherwise used in specified form (§372.25(g)). Below are some examples (see Table II of EPA's *TRI Reporting Forms and Instructions* document):

<u>CHEMICAL</u>	<u>CAS#</u>	<u>QUALIFIER</u>
Aluminum	7429-90-5	Fume or dust
Aluminum oxide	1344-28-1	Fibrous forms
Asbestos	1332-21-4	Friable forms
Isopropyl alcohol	67-63-0	Manufactured by strong acid process
Phosphorus	7723-14-0	Yellow or white
Saccharin	81-07-2	Manufacture only
Hydrochloric acid	7647-01-0	Acid aerosols
Sulfuric acid	7664-93-9	Acid aerosols
Vanadium	7440-62-2	Except when contained in alloy

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SECTION 313 CHEMICALS

- **Calculate threshold determinations and releases and other waste management estimates by multiplying the percentage of a Section 313 chemical by the total amount of the mixture, other trade name product, or waste**
 - **Example: 80,000 pounds of a solvent containing benzene was used on-site at the facility to clean machinery. The solvent contains 10% benzene.**
 - » **80,000 lbs. X 10% = 8,000 lbs. of benzene otherwise used**

C-7

COMPOUND CATEGORIES

- **Count together all compounds that fall within a category, even if different compounds within a category are used in separate operations**
 - **Example: If a facility processes 20,000 pounds of 2-Butoxyethanol in one operation and 10,000 pounds of 2-(2-Butoxyethoxy)ethanol in another operation during the reporting year**
 - » **30,000 pounds of glycol ethers have been processed. Reporting for glycol ethers category is required**
- **Consider the entire weight of the compounds in the category when determining thresholds**
 - **Calculations for release and other waste management estimate are different for metal and nitrate compounds**

C-8

SUPPLIER NOTIFICATION FOR MIXTURES AND OTHER TRADE NAME PRODUCTS

- **Supplier notification (§372.45) - requires suppliers to facilities described in §372.22 (i.e., covered facilities) to:**

- **Identify Section 313 chemical(s) by name and CAS number**
- **Identify Section 313 chemical(s) as being subject to Section 313 requirements**
- **Provide concentration (or range) of Section 313 chemicals in mixtures and other trade name products (not wastes)**
- **Provide notification at least annually in writing or attached to the MSDS**
- **Update notification when changes occur**
- **Only facilities in primary SIC codes 20-39 must initiate the notification**

C-9

DETERMINING CONCENTRATIONS OF SECTION 313 CHEMICALS

- **Chemical component - include in threshold "each listed Section 313 chemical known to be present" (EPCRA Section 313(g)(1)(C)) at a concentration greater than the *de minimis* limits**
 - **"Known" - knowledge based on MSDS, analytical data, process knowledge, labeling, literature, other vendor-supplied information, or existing analysis**
 - **If concentration is unknown, threshold determination for the Section 313 chemical is not required (§372.30(b)(3))**

C-10

DETERMINING CONCENTRATIONS IN MIXTURES OR OTHER TRADE NAME PRODUCTS

- **Include a Section 313 chemical in the threshold determinations if you know (§372.30(b)(3)):**
 - **Exact concentration - use concentration provided**
 - **Upper bound - use upper limit**
 - **Range - use the midpoint of the range**
 - **Lower bound - subtract out other known constituents, create a range, and use the midpoint of range**
- **Note: Thresholds are based on weight in pounds, except for dioxins and dioxin-like compounds**

C-11

DETERMINING CONCENTRATIONS IN WASTES

- ***De minimis* exemption does not apply to wastes that are processed or otherwise used**
- **If concentration is exact, upper bound, range, or lower bound, use the guidance for mixtures and other trade name products**
- **If concentration is below detection limit, use engineering judgment:**
 - **If the Section 313 chemical is expected to be present, you could assume 1/2 of full detection limit**
 - **If the Section 313 chemical is not expected to be present, you could assume 0**

C-12

MEETING MULTIPLE THRESHOLDS

- **There are many situations where one Section 313 chemical must be counted towards multiple activity thresholds**
 - Section 313 chemicals manufactured or imported on-site, then used or incorporated into a product (processed)
 - Section 313 chemicals formed during destruction of wastes received from off-site and subsequently destroyed on-site (manufactured and otherwise used)
 - Section 313 chemicals that are otherwise used on-site, recycled, then processed
- **Section 313 chemicals should not be counted twice towards the same activity threshold**

C-13

WATCH FOR DOUBLE COUNTING WITHIN THE SAME ACTIVITY THRESHOLD!!!

- **For threshold determinations, Section 313 chemicals reused or recycled at a facility: count original amount used only once (§372.25(e))**
 - **Note: Section 313 chemicals sent off-site for recycling and returned to the facility are considered new materials and counted for threshold determinations**
 - **For materials in use from previous years: count only the quantity added during current reporting year**

C-14

MULTI-ESTABLISHMENT FACILITY

■ Determining how facilities report

- **Multi-establishment facility (§372.30(c))**
 - › **Apply threshold determination on aggregate amount of chemicals used at facility**
 - › **Able to file separate Form R reports for each establishment if they are distinct economic entities (must be designated as part of a facility on Form R)**
 - › **Report all releases and other waste management activities of reportable Section 313 chemicals**
 - › **Avoid double-counting of chemicals involved in intra-facility transfers**

C-15

CALCULATING THRESHOLDS

- Consider all activities**
- Consider all sources**
- Identify the avenues through which mixtures and trade name products enter your facility**
 - **Purchasing/inventory control**
 - **Contractors**
 - **Bulk deliveries**
 - **Capital purchases**
 - **“Credit card” or “emergency” purchases**
 - **Chemicals used in neutralization, refrigerants, cleaners, paints, lubricants (for non-vehicles), fuel (for non-vehicles), refractory bricks**

C-16

ORCHESTRATING DATA COLLECTION

■ Methods for orchestrating data collection

- Coordinate with purchasing/vendors
- Develop inventory controls
- Require requisition or "sign out" procedure for Section 313 chemicals
- Take year-end inventories

■ Identify ALL chemical purchasing and usage

■ Threshold determination worksheets for both PBT and non-PBT Section 313 chemicals

C-17

EXAMPLE: EPCRA Section 313 Non-PBT Chemical Reporting Threshold Worksheet

Facility Name: OMNI CHEMICAL Date Worksheet Prepared: _____
 Toxic Chemical or Chemical Category: Toluene Prepared By: J.S.P.
 Reporting Year: _____

Step 1. Identify amounts of the toxic chemical manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (in lbs)	Amount of the Listed Toxic Chemical by Activity (in lbs):		
				Manufactured	Processed	Otherwise Used
1. Joe's Degreaser	Purchasing	50	10,000			5,000
2. Yellow Safety Paint	Vendor	5	30,000			1,500
3. Parts Washer Fluid	Purchasing	40	10,000			4,000
4.						
5.						
6.						
7.						
Subtotal:				(A) _____ lbs.	(B) _____ lbs.	(C) 10,500 lbs.

Step 2. Identify exempt forms of the toxic chemical that have been included in Step 1.

Mixture Name as Listed Above	Applicable Exemption	Note: Fraction or Percent Exempt (if Applicable)	Exempt Amount of the Toxic Chemical from Above (in lbs):		
			Manufactured	Processed	Otherwise Used
1. Yellow Safety Paint	Struct. Comp.	100			1,500
2.					
3.					
4.					
5.					
6.					
7.					
Subtotal:			(A ₁) _____ lbs.	(B ₁) _____ lbs.	(C ₁) 1,500 lbs.

Step 3. Calculate the amount subject to threshold: (A - A₁) _____ lbs. (B - B₁) _____ lbs. (C - C₁) 9,000 lbs.

Compare to thresholds for section 313 reporting. 25,000 lbs. 25,000 lbs. 10,000 lbs.

If any threshold is met, reporting is required for all activities. Do not submit this worksheet with Form R. Retain for your records.

C-18

MANAGEMENT PRACTICES

■ Begin early

- Implement a program to gather “real-time” data on usage
- Searches for historical information can be difficult

■ Use a team approach

- Include all relevant personnel (e.g., engineering, environmental, operations)
- Spread the work

C-19

RECORDKEEPING

■ Detailed records

- Improve reporting accuracy and data quality
- Reduce replication of effort from year to year

■ Well-labeled calculations and assumptions

- Serve as standard operating procedures (SOPs) for future years
- Ensure consistency from year to year, especially if personnel responsible for reporting change

■ EPA will review records during a data quality audit

C-20

AUTOMATED TRI REPORTING SYSTEM (ATRS)

- **Voluntary option to submit form electronically**
- **Forms submitted on diskette and loaded directly into EPA's TRI Database**
- **Windows 95, 98, NT and 2000 versions available**
- **ATRS has built-in data validation program and pick lists**
- **A signed ATRS - generated cover letter is the sole paper requirement**

C-21

OVERVIEW OF FORM R, PART I

- **Two principal types of information**
 - **Facility-specific**
 - **Chemical-specific**
- **One form must be submitted to EPA and to the SERC/TERC for each Section 313 chemical or chemical category exceeding applicable thresholds (§372.30(a))**

C-22

PART I: FACILITY INFORMATION

- Identifies the facility
- Provides key data for linking information to other databases
- Identifies key personnel

C-23

PART I. SECTIONS 1 AND 2

- Reporting year is the calendar year to which the reported information applies; not the year in which the form is submitted
- Trade secret submissions require substantiation
- Two forms are required for trade secret submissions:
 - One complete
 - One "sanitized" version
- Separate process for national security claims

PART I. FACILITY IDENTIFICATION INFORMATION			
SECTION 1. REPORTING YEAR _____			
SECTION 2. TRADE SECRET INFORMATION			
2.1	Are you claiming the toxic chemical identified on page 2 trade secret? <input type="checkbox"/> Yes (Answer question 2.2; Attach substantiation forms) <input type="checkbox"/> No Do not answer 2.2; go to Section 3	2.2	Is this copy <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized (Answer only if "YES" in 2.1)

C-24

PART I. SECTION 3

- An original signature is required
- Name must be legible (printed or typed)
- Title of the official who signs is also required

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:

C-25

PART I. SECTION 4.1

- All parts of the facility name and address are essential
- Mailing address required if different from street address
- TRI facility identification number (if a form was filed in a previous reporting year) or "New Facility" (if reporting for the first time)
- All establishments at one facility should use the same TRI facility identification number (if reporting separately)

SECTION 4. FACILITY IDENTIFICATION			
4.1	TRI Facility ID Number		
Facility or Establishment Name		Facility or Establishment Name or Mailing Address (if different from street address)	
Street		Mailing Address	
City/County/State/Zip Code		City/County/State/Zip Code	Country (Non-US)

C-26

PART I. SECTION 4.1

■ Federal facilities

- Enter name of Federal department or agency standard acronym followed by the site name

SECTION 4. FACILITY IDENTIFICATION		
4.1	TRI Facility ID Number	
Facility or Establishment Name		Facility or Establishment Name or Mailing Address (if different from street address)
U.S. DOE, Kansas City Plant		
Street		Mailing Address
City/County/State/Zip Code		City/State/Zip Code Country (Non-US)

C-27

PART I. SECTION 4.2 THROUGH 4.4

■ Specify whether the form covers all or part of the facility

- -Federal facilities and GOCOs also check either "c" or "d," but not both

■ List name and phone number

- Technical contact - should be able to explain data to EPA
- Public contact - should be able to represent the facility's data to the public

SECTION 4. FACILITY IDENTIFICATION (Continued)		
4.2	This report contains information for: (Important: check a or b to check c if applicable) a. <input type="checkbox"/> An entire facility b. <input type="checkbox"/> Part of a facility c. <input type="checkbox"/> A Federal facility d. <input type="checkbox"/> GOCO	
4.3	Technical Contact Name	Telephone Number (include area code)
4.4	Public Contact Name	Telephone Number (include area code)

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PART I. SECTION 4.5 THROUGH 4.6

■ Enter covered 4-digit SIC code(s)

- Enter primary SIC code in first box (a.)
- Enter other covered SIC codes in decreasing order of significance

■ Supply latitude and longitude coordinates

4.5	SIC Code(s) (4-digits)	Primary			b.	c.	d.	e.	f.
		a.							
4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds	

C-29

PART I. SECTION 4.7 THROUGH 4.10

■ Enter the specified identification numbers or "NA" if not applicable

- Enter Dun and Bradstreet number(s)
- EPA ID numbers (assigned to RCRA-covered facilities)
- NPDES permit number(s)
- Underground Injection Well Code (UIC) I.D. number(s)

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

C-30

PART I. SECTION 5

■ Private-sector and GOCO facilities

- Enter complete name and Dun & Bradstreet number of parent company

■ Federal facilities

- Enter the complete name of department or agency for parent company (e.g., U.S. Department of Interior)
- Check "NA" for Dun & Bradstreet number of parent company

SECTION 5. PARENT COMPANY INFORMATION			
5.1	Name of Parent Company	<input type="checkbox"/> NA	
5.2	Parent Company's Dun & Bradstreet Number	<input type="checkbox"/> NA	(9 digits)

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PART II: CHEMICAL-SPECIFIC INFORMATION

■ Identifies

- Section 313 chemical and its uses at the facility
- Quantities released or otherwise managed as wastes
- Waste management and source reduction activities
- Maximum quantity of the Section 313 chemical on site at one time

C-32

PART II. SECTIONS 1 AND 2: TOXIC CHEMICAL OR MIXTURE IDENTITY

- Complete either Sections 1.1 & 1.2 or Section 1.3 or Section 2
- Enter CAS number or category code and name of Section 313 chemical or chemical category (except on "sanitized" form)
- Enter generic name only if claiming Section 313 chemical name as a trade secret (Section 1.3)

SECTION 1. TOXIC CHEMICAL IDENTITY		(Important: DO NOT complete this section if you completed 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.)	

C-33

PART II. SECTIONS 1 AND 2: TOXIC CHEMICAL OR MIXTURE IDENTITY

- If supplier claims trade secret, report generic name by supplier

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.)	

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PART II. SECTION 3 OF THE FORM R: ACTIVITIES AND USES OF THE CHEMICAL AT THE FACILITY

- Specify use(s) of the Section 313 chemical: manufacture, process, or otherwise use
- Report only activities taking place at reporting facility
- Check all applicable boxes

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY (Important: Check all that apply)		
3.1 Manufacture the toxic chemical: a. <input type="checkbox"/> Produce; b. <input type="checkbox"/> Import If produce or import: c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity	3.2 Process the toxic chemical: a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity	3.3 Otherwise use the toxic chemical: a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use

EXERCISE #1

IDENTIFYING EPCRA SECTION 313 CHEMICALS

- Purpose:** Familiarize participants with the chemical lists in Table 2 of EPA's *TRI Forms and Instructions* document.
Ability to identify correctly Section 313 chemicals from MSDSs.
- Take-Aways:** Understanding of nuances of chemical compositions.
- Materials:** *TRI Reporting Forms and Instructions* document
Material Safety Data Sheets (MSDSs)
- Instructions:** Attached is a package of chemicals, chemical compounds, and chemical mixtures present at your facility. Determine if any of these chemicals or parts of these chemicals is on the EPCRA Section 313 list. If you determine that a chemical or component of a product or mixture is on the list present at or above the appropriate *de minimis* level, prepare a list of the appropriate Section 313 chemicals and CAS numbers.

IDENTIFYING EPCRA SECTION 313 CHEMICALS

[illegible]

MEADOWBROOK COMPANY

SPELTER, WEST VIRGINIA 26438

RAW MATERIAL SUPPLIER DATA SHEET

I. TRADE NAME CRUDE ZINC OXIDE

CHEMICAL NAME ZINC OXIDE

EPA/GAS 1314-13-2

MANUFACTURER

MEADOWBROOK COMPANY
DIV OF T. L. DIAMOND & CO., INC.

<u>SPECIFICATIONS</u>	<u>GRADE A</u>	<u>GRADE B</u>
Zn	50-59%	60%-68%
Fe	1-3%	1-3%
Al	.8-3.5%	.8-3.5%
Pb	0.1-0.5 Avg. 0.2	0.1-0.5 Avg. 0.2%
Cl	0.0-0.3%	0.0-0.3%
Cd	Less Than .01	Less Than .01
Cu	0.04-0.40	0.04-0.40

II. NON TOXIC SOLID MATERIAL WITH A PARTICLE SIZE RANGE UP TO 1/4 INCH.

III. SPECIFIC GRAVITY 5.6.
APPARENT DENSITY 130-160 LBS/CU FOOT
NON SOLUABLE IN WATER NON VOLATILE
LIGHT GRAY, ODORLESS COARSE POWDER

IV. NO FIRE OR EXPLOSION HAZARD. CAN REACT WITH MAGNESIUM OR CARBON WHEN HEATED.

V. NO PARTICULAR HEALTH HAZARD, TLV (S) FOR PRINCIPLE INGREDIENT
PEL 5 Mg/M³ FOR ZINC OXIDE FUME

VI. NON REACTIVE AT AMBIENT EXCEPT WITH MINERAL ACIDS

II. SPILL OR LEAK PROCEDURES
Clean up & return to labeled containers

I. PERSONAL PROTECTION
Niosh respirator suggested for comfort when material is dry & dusty

HANDLERS SHOULD WEAR GLOVES AND SAFETY GOGGLES.

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MATERIAL SAFETY
DATA SHEET

3M

DIVISION: INDUSTRIAL MINERAL DIVISION
TRADE NAME:
3M BRAND ROOFING GRANULES (WAUSAU, WI)

3M I.D. NUMBER: 98-0111-1216-0 98-0111-1217-8 98-0111-1218-6 98-0111-1219-4
98-0111-1220-2 98-0111-1221-0 98-0111-1222-8 98-0111-1223-6
98-0111-1252-5 98-0111-1253-3 98-0111-1278-0 98-0111-1288-9
98-0111-1290-5 98-0111-1292-1 98-0111-1293-9 98-0111-1294-7
98-0111-1318-4 98-0111-1319-2 98-0111-1320-0 98-0111-1321-8
98-0111-1322-6 98-0111-1323-4 98-0111-1324-2 98-0111-1325-9
98-0111-1348-1 98-0111-1444-8 98-0111-1445-5 98-0111-1446-3
98-0111-1447-1 98-0111-1448-9 98-0111-1449-7 98-0111-1450-5
98-0111-1451-3 98-0111-1452-1 98-0111-1453-9 98-0111-1454-7
98-0111-1457-0 98-0111-1484-4 98-0111-1488-5

ISSUED: SEPTEMBER 13, 1994
SUPERSEDES: NOVEMBER 23, 1993
DOCUMENT: 10-0170-0

1. INGREDIENT	C.A.S. NO.	PERCENT
PLAGIOCLASE FELDSPAR	None	30.0 - 35.0
QUARTZ	14808-60-7	25 - 35
POTASSIUM FELDSPAR	None	28 - 25
SODIUM SILICATE	1344-09-8	< 5.0
KAOLIN	1332-58-7	< 5.0
CARBON BLACK	1333-86-4	< 0.9
CHROMIUM OXIDE (TRIVALENT CHROMIUM)	1308-38-9	< 0.9
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	64742-52-5	< 0.9
RUTILE TITANIUM DIOXIDE	1317-80-2	< 0.9
IRON OXIDE (FE2O3)	1309-37-1	< 0.9
ZINC FERRITE	12063-19-3	< 0.9

NOTE: THE AMOUNT OF DUST GENERATED WHILE HANDLING THESE ROOFING GRANULES IS EXPECTED TO VARY DEPENDING ON THE USER'S OPERATION. THE LEVEL OF RESPIRABLE CRYSTALLINE SILICA IS EXPECTED TO BE LESS THAN 15% OF THE RESPIRABLE DUST.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-ACT OF 1986 AND 40 CFR PART 372:

CHROMIUM OXIDE (TRIVALENT CHROMIUM)
ZINC FERRITE

2. PHYSICAL DATA

BOILING POINT: N/A
VAPOR PRESSURE: N/A
VAPOR DENSITY: N/A
EVAPORATION RATE: N/A
SOLUBILITY IN WATER: N/A
SP. GRAVITY: 2.6-2.7
PERCENT VOLATILE: N/A
VOLATILE ORGANICS: N/A

Abbreviations: N/D - Not Determined N/A - Not Applicable

MATERIAL SAFETY
DATA SHEET

3M

MSDS: 3M BRAND ROOFING GRANULES (WAUSAU, WI)
SEPTEMBER 13, 1994

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2. PHYSICAL DATA

(CONTINUED)

VOC LESS H₂O & EXEMPT SOLVENT N/A
PH: SL BASIC
VISCOSITY: N/A
MELTING POINT: N/A
APPEARANCE AND ODOR: Granules, Various colors, slightly oily odor

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A
FLAMMABLE LIMITS - LEL: N/A
FLAMMABLE LIMITS - UEL: N/A
AUTOIGNITION TEMPERATURE: ... N/A
EXTINGUISHING MEDIA:
Non-combustible. Choose material suitable for surrounding fire.
SPECIAL FIRE FIGHTING PROCEDURES:
Not applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS:
No unusual fire or explosion hazards are anticipated.

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
Not applicable.
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
None known.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:

Observe precautions from other sections. Collect spilled material.
Use wet sweeping, compound or water to avoid dusting.

RECOMMENDED DISPOSAL:

Dispose of waste product in a sanitary landfill.

Since regulations vary, consult applicable regulations or authorities
before disposal.

ENVIRONMENTAL DATA:

Not determined.

REGULATORY INFORMATION:

U.S. EPA Hazardous Waste Number = None (Not U.S. EPA Hazardous). In
the event of an uncontrolled release of this material, the user
should determine if the release qualifies as a reportable quantity.

EPCRA HAZARD CLASS:

FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

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MATERIAL SAFETY
DATA SHEET

3M

MSDS: 3M BRAND ROOFING GRANULES (WAUSAU, WI)
SEPTEMBER 13, 1994

PAGE: 3 of 5

6. SUGGESTED FIRST AID

EYE CONTACT:

Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:

No need for first aid is anticipated in the event of skin contact.

INHALATION:

If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:

Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:

Avoid eye contact. The following should be worn alone or in combination, as appropriate, to prevent eye contact: Wear safety glasses with side shields.

SKIN PROTECTION:

Avoid prolonged or repeated skin contact..

VENTILATION PROTECTION:

If exhaust ventilation is not available, use appropriate respiratory protection.

RESPIRATORY PROTECTION:

Avoid breathing of dust. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: half-mask dust respirator.

PREVENTION OF ACCIDENTAL INGESTION:

Wash hands after handling and before eating.

RECOMMENDED STORAGE:

Not applicable.

FIRE AND EXPLOSION AVOIDANCE:

Not applicable.

INGREDIENTS	EXPOSURE LIMITS		TYPE AUTH	SKIN
	VALUE	UNIT		
PLAGIOCLASE FELDSPAR	NONE	NONE	NONE NONE	
QUARTZ	0.1	mg/m3	TWA ACGIH	
	as quartz resp. dust			

MATERIAL SAFETY
 DATA SHEET



MSDS: 3M BRAND ROOFING GRANULES (WAUSAU, WI)
 SEPTEMBER 13, 1994

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7. PRECAUTIONARY INFORMATION (CONTINUED)

INGREDIENTS	EXPOSURE LIMITS		TYPE	AUTH	SKIN*
	VALUE	UNIT			
QUARTZ	0.1	mg/m ³	TWA	OSHA	
POTASSIUM FELDSPAR	as quartz resp.	dust	NONE	NONE	
SODIUM SILICATE	NONE	NONE	NONE	NONE	
KAOLIN	2	mg/m ³	TWA	ACGIH	
KAOLIN	respirable dust.				
CARBON BLACK	10	mg/m ³	TWA	OSHA	
CARBON BLACK	3.5	mg/m ³	TWA	ACGIH	
CHROMIUM OXIDE (TRIVALENT CHROMIUM) ..	3.5	mg/m ³	TWA	OSHA	
CHROMIUM OXIDE (TRIVALENT CHROMIUM) ..	0.5	mg/m ³	TWA	ACGIH	
CHROMIUM OXIDE (TRIVALENT CHROMIUM) ..	as Cr				
CHROMIUM OXIDE (TRIVALENT CHROMIUM) ..	0.5	mg/m ³	TWA	OSHA	
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	as Cr				
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	5	mg/m ³	TWA	CMRG	
RUTILE TITANIUM DIOXIDE	10	mg/m ³	STEL	CMRG	
RUTILE TITANIUM DIOXIDE	10	mg/m ³	TWA	ACGIH	
RUTILE TITANIUM DIOXIDE	10	mg/m ³	TWA	OSHA	
IRON OXIDE (FE2O3)	5	mg/m ³	TWA	ACGIH	
IRON OXIDE (FE2O3)	as Fe				
IRON OXIDE (FE2O3)	10	mg/m ³	TWA	OSHA	
IRON OXIDE (FE2O3)	as fume				
IRON OXIDE (FE2O3)	5	mg/m ³	TWA	ACGIH	
ZINC FERRITE	as Fe				
ZINC FERRITE	NONE	NONE	NONE	NONE	

* SKIN NOTATION: Listed substances indicated with "N" under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:

- ACGIH: American Conference of Governmental Industrial Hygienists
- OSHA: Occupational Safety and Health Administration
- CMRG: Chemical Manufacture Recommended Guidelines
- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:

May cause eye irritation if dust gets into eyes.

SKIN CONTACT:

No adverse health effects are expected from skin contact.

INHALATION:

Single overexposure, above recommended guidelines, may cause:

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612/733-1110

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12747

CT 2192 -7
PAGE 5

**MATERIAL SAFETY
DATA SHEET**

3M

**MSDS: 3M BRAND ROOFING GRANULES (WAUSAU, WI)
SEPTEMBER 13, 1994**

PAGE: 5 of 5

8. HEALTH HAZARD DATA (continued)

Irritation (upper respiratory): signs/symptoms can include
soreness of the nose and throat, coughing and sneezing.

Prolonged or repeated overexposure, above recommended guidelines,
may cause:

Silicosis: signs/symptoms can include shortness of breath and
persistent coughing.

Pneumoconiosis (general): signs/symptoms can include persistent
coughing and shortness of breath.

IF SWALLOWED:

Ingestion is not a likely route of exposure to this product.

CANCER:

QUARTZ SILICA (14808-60-7) is a potential cancer hazard causing lung
tumors by the inhalation and intratracheal routes of exposure in
laboratory animal studies (NTP anticipated human carcinogen, IARC
probable human carcinogen 2A, Calif. Proposition 65).

SECTION CHANGE DATES

HEADING	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
INGREDIENTS	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
ENVIRON. DATA	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
PRECAUT. INFO.	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
HEALTH HAZD. DATA	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best
opinion as to the proper use in handling of this material under normal
conditions. Any use of the material which is not in conformance with this
information is at the user's risk.



MATERIAL SAFETY DATA SHEET

Sealed Air Corporation

Engineered Products Division
3 Old Sherman Trce. Danbury, CT 06810 (203) 791-3500

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EMERGENCY TELEPHONE NO: (203) 791-3500 M-F 8:30-5:00 ET
CHEMTREC 1-800-424-9300 (for Chemical Emergency
spill, leak, fire exposure or accident, 24 hours)

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: INSTAPAK • COMPONENT "A"
Chemical Name: Polymethylene Polyphenylisocyanate
Trade Name: Polymeric MDI
Chemical Family: Aromatic Isocyanates
Chemical Formula: N.A.

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

<u>Hazardous Ingredients:</u>	<u>CAS No.</u>	<u>Wt. %</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>
Polymeric Diphenylmethane Diisocyanate ("polymeric" MDI)	9016-87-9	100	N.E.	N.E.
Contains:				
4,4'-Diphenylmethane diisocyanate (4,4'-MDI; CAS 101-68-8; = 45%)			0.02 ppm (Ceiling)	0.005 ppm (TWA)
Other MDI isomers and oligomers			N.E.	N.E.

SECTION 3 - HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW

Health Hazards: Irritating to eyes, respiratory system and skin. Inhalation at levels above the occupational exposure limit could cause respiratory sensitization. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons. Sensitized persons should not be exposed to any mixture containing unreacted MDI.

Physical Hazards: Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures.

Appearance: Dark brown liquid.

Odor: Slightly aromatic (musty).

Note: Read the entire MSDS for a more thorough evaluation of the hazards.



SECTION 4 - FIRST AID MEASURES

Inhalation: Remove from further exposure and obtain medical attention. Treatment is symptomatic for primary irritation or difficulty in breathing. If breathing is labored, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing. Asthmatic-like symptoms, if manifested, may develop immediately, or be delayed for up to several hours.

Skin Contact: Wash affected area thoroughly with soap and water. Launder contaminated clothing thoroughly before reuse. If irritation, redness, or a burning sensation develops and persists, obtain medical advice.

Eye Contact: Flush with copious amounts of water for at least 15 minutes, holding lids open with fingers. If irritation persists, repeat flushing. Refer individual to a physician for immediate follow-up.

Ingestion: Do NOT induce vomiting. Provided the patient is conscious, wash out mouth with water then give 1 or 2 glasses of water to drink. Refer person to medical personnel for immediate attention.

Note to Physicians: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for 48 hours. Pulmonary disorders may be aggravated by overexposure.

SECTION 5 - FIRE-FIGHTING MEASURES

Flash Point: 390° F (199° C) (Pensky-Martens Closed Cup)

Flammable Limits (lower): Not available

Flammable Limits (upper): Not available

Extinguishing Media: Carbon dioxide (CO₂), dry chemical, or chemical foam. If water is used, large quantities are required. Contain run-off water with temporary barriers.

Fire and Explosion Hazards: Containers may burst under intense heat. Avoid water contamination in closed containers; carbon dioxide is evolved which can cause pressure build-up. Caution: Reaction between water and hot isocyanate can be vigorous.

Special Fire Fighting Procedures: Firefighters must wear self-contained breathing apparatus to protect against toxic and irritating vapors; full protective clothing should also be worn.

NEPA Hazard Code:	Health:	2
	Flammability:	1
	Reactivity:	1
	Special Hazard:	None

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Evacuate area surrounding the spill and prevent further leakage, spillage or entry into drains. Eye and skin protection should be worn during spill cleanup and ventilation maintained. If the potential for airborne concentrations of MDI above the PEL exists, then respiratory protection should be worn.



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SECTION 6 - ACCIDENTAL RELEASE MEASURES (continued)

Contain and cover spill with loose absorbent (earth, sand, sawdust or other absorbent material), or absorbent pillows, pads or socks. Collect absorbed material in open containers or plastic bags, and treat with deactivating solution (90% water, 8% concentrated ammonia, 2% detergent). Allow to stand uncovered for 48-72 hours to permit carbon dioxide to escape and solidification to occur. Wash spill area with deactivating solution and let stand for 15 minutes or longer. Dispose of spilled material properly.

SECTION 7 - HANDLING AND STORAGE

Storage Temperature: Min. 50° F (10° C) Max. 100° F (38° C)

Average Shelf Life: 6 months

Special Sensitivity: Reacts with moisture to produce carbon dioxide gas.

Precautions to be Taken in Handling and Storage: Do not store drums uncovered outdoors. Do not reseal containers unless it is certain that no moisture contamination has occurred. Do not breathe vapors or allow skin contact.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

<u>Exposure Limits:</u>	OSHA-PEL:	4,4'-Diphenylmethane diisocyanate:	Ceiling = 0.02 ppm
	ACGIH-TLV:	4,4'-Diphenylmethane diisocyanate:	TWA = 0.005 ppm

<u>HMIS Hazard Code:</u>	Health	3	(Personal Protective Equipment)
	Flammability	1	
	Reactivity	1	
	PPE	B	

Respiratory Protection: Due to the low vapor pressure of this material, the PEL is not likely to be exceeded under normal conditions. If the material is heated or spilled in a confined area, respiratory protection should be worn. Because of their short life and lack of breakthrough indicators, cartridge type respirators equipped for organic vapors are generally not recommended for use with isocyanates. They can be used for short term emergency situations at concentrations below the PEL where the presence of adequate breathing oxygen can be assured. Where concentrations exceed the PEL, air supplied respirators must be used.

Eye Protection: Goggles or safety glasses with side shields.

Protective Clothing: Chemical resistant butyl rubber, nitrile rubber, neoprene, or other suitable protective gloves.

Ventilation: Use local exhaust ventilation if necessary to maintain levels below the PEL. For guidance on engineering controls refer to the ACGIH publication "Industrial Ventilation".

Other: Eyewash station, safety shower and deactivating solution should be available. Refer to the "Recommendations for the Safe Use and Handling of Instapak® Foam-in-Place Chemicals" bulletin before handling Instapak® chemicals.



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One Sherman Lane, Danbury CT 06810, 2031 791-2500

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SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<u>Form:</u> Liquid	<u>Boiling Point:</u> 406° F (208° C)
<u>Color:</u> Dark brown	<u>Vapor Pressure:</u> < 10 ⁻³ mm Hg @ 25° C (for Polymeric MDI)
<u>Odor:</u> Slightly aromatic (musty)	<u>Specific Gravity:</u> 1.24 @ 25° C
<u>Vapor Density (Air = 1):</u> 8.5	<u>Bulk Density:</u> 10.3 lbs/gal
<u>Molecular Weight:</u> Approx. 350	<u>% Volatile by Volume:</u> Nil
<u>Melting Point:</u> N. E.	<u>Solubility in Water:</u> Not soluble. Reacts slowly with water to liberate CO ₂ gas.

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable under normal conditions. Avoid temperatures above 110° F (43° C) or below 40° F (4° C).

Polymerization: May occur at elevated temperatures in the presence of moisture, alkalies, tertiary amines and metal compounds.

Conditions to Avoid: Contact with moisture and other materials which contain active hydrogen.

Incompatible Materials: Water, amines, strong bases and alcohols. The reaction with water is slow at temperatures less than 120°F (49°C) but is accelerated at higher temperatures.

Hazardous Decomposition Products: Highly unlikely under normal industrial use. Exposure to fire or extreme heat may generate oxides of carbon, oxides of nitrogen, and traces of hydrogen cyanide.

SECTION 11 - TOXICOLOGICAL INFORMATION

Polymeric MDI:

LD ₅₀ , Oral:	>15,800 mg/kg (rat)
LD ₅₀ , Dermal:	>5000 mg/kg (rabbit)
LC ₅₀ , Inhalation:	370 - 490 mg/m ³ /4 hours (rat) for an aerosol of polymeric MDI

Primary Route(s) of Exposure: Skin contact from liquid. Inhalation. However, due to the low vapor pressure, overexposure is not expected under normal conditions unless material is heated or used in a poorly ventilated area.

Inhalation: This product is a respiratory irritant and potential respiratory sensitizer. Inhalation of vapor or aerosol at levels above the occupational exposure limit can cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat, and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized person. Sensitized persons should be removed from any further exposure. Persons with asthma-type conditions or other chronic respiratory diseases should be excluded from working with MDI. In a single evaluation of 5 men occupationally exposed to MDI and hydrocarbon solvent vapors under conditions where adequate ventilation or other safety precautions were not used, neuropsychologic findings were attributed to MDI.

Skin Contact: May cause irritation or rash. Can cause skin discoloration. Repeated and/or prolonged contact may result in skin sensitization. There is limited evidence from laboratory tests that skin contact may play a role in respiratory sensitization. This data reinforces the need to prevent direct skin contact and the importance of protective gloves.



SECTION 11 - TOXICOLOGICAL INFORMATION (continued)

Eye Contact: Liquid can cause eye irritation, tearing, reddening and swelling. Permanent corneal injury is unlikely. Exposure to MDI vapors in excess of 0.02 ppm may cause irritation.

Ingestion: Ingestion is unlikely. Based on the acute oral LD_{50} , this product is considered practically non-toxic by ingestion. Ingestion can cause irritation and corrosive action in the mouth, stomach and digestive tract.

Chronic Effects: A study was conducted where groups of rats were exposed for 6 hours/day, 5 days/week for a lifetime to atmospheres of respirable polymeric MDI aerosol either at concentrations of 0, 0.2, 1, or 6 mg/m³ (which corresponds to MDI levels equal to the OSHA-PEL, 5 times the OSHA-PEL and 30 times the OSHA-PEL). No adverse effects were observed at 0.2 mg/m³ concentrations. At the 1 mg/m³ concentration, minimal nasal and lung irritant effects were seen. Only at the top concentration (6 mg/m³) was there an increased incidence of benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). Overall, the tumor incidence, both benign and malignant, and the number of animals with tumors were not different. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur.

Carcinogenicity: The ingredients of this product (>0.1%) are not classified as carcinogenic by ACGIH or IARC, not regulated as carcinogens by OSHA and not listed as carcinogens by NTP.

Mutagenicity: There is no substantial evidence of mutagenic potential.

Reproductive Effects: No adverse reproductive effects are anticipated.

Teratogenicity and Fetotoxicity: No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. The dose that produced this effect (1.2 ppm) is 60 times higher than the OSHA-PEL. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations well in excess of the defined occupational exposure limits.

SECTION 12 - ECOLOGICAL INFORMATION

Environmental Fate and Distribution: It is unlikely that significant environmental exposure in the air or water will arise, based on consideration of the production and use of the substance.

Persistence and Degradation: Immiscible with water, but will react with water to produce carbon dioxide, and inert and non-biodegradable solids.

Aquatic Toxicity:

LC ₅₀ :	>1000 mg/l (Zebra fish) At the highest level of 1000 mg/l, there were no deaths.
EC ₅₀ (24 hour):	>1000 mg/l (Daphnea magna)
EC ₅₀ :	>100 mg/l (E. Coli)

SECTION 13 - DISPOSAL CONSIDERATIONS

Incinerate or dispose of in accordance with existing federal, state and local environmental control regulations. This material is not a hazardous waste under RCRA 40 CFR 261 when disposed of in its purchased form. Quantities should be treated with deactivation solution outlined in Section 6. Refer to the "Recommendations for the Safe Use and Handling of Instapak® Foam-in-Place Chemicals" bulletin for additional information concerning disposal of wastes and empty containers. Chemical waste, regardless of quantity, should not be poured into drains, sewers or waterways.



Sealed Air Corporation

Engineering Products Division

1200 Sherman Ave. Carbury, CT 06810 2031 791-3500

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SECTION 14 - TRANSPORT INFORMATION

DOT: Containers less than 5,000 pounds are not regulated.

IMO: Not regulated.

IATA/ICAO Class: Not regulated.

Reportable Quantity (RQ): 5,000 lbs. for Methylene diphenyl diisocyanate (MDI), CAS #101-68-8 (\approx 45% of product).

SECTION 15 - REGULATORY INFORMATION

OSHA Status: This product is considered hazardous under the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All ingredients are listed or are not required to be listed.

SARA 302 Extremely Hazardous Substances: None

SARA 311/312 Hazard Categories:
Immediate (acute) Health Hazard
Delayed (chronic) Health Hazard
Reactive Hazard

SARA 313 Listed Ingredients: This product contains the following chemicals subject to the reporting requirements: 100% Diisocyanate compounds (Category Code N120).

RCRA Status: Discarded product is not a hazardous waste under RCRA, 40 CFR 261, when disposed of in its purchased form.

SECTION 16 - OTHER INFORMATION

The following states have regulations that apply to the use of this product.

MA Massachusetts Hazardous Substance List
PA Pennsylvania Hazardous Substance List

NJ New Jersey Hazardous Substance List

The appropriate state agency should be contacted for further details on regulatory requirements for the substances shown below.

<u>Ingredient</u>	<u>CAS No.</u>	<u>Wt. %</u>
Methylene bisphenyl isocyanate (MDI)	101-68-8	45
(Benzene, 1,1'-methylenebis[4-] isocyanato-)		

Section(s) Revised: Format change

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minimum 10% post consumer) using vegetable based inks
M-3 Rev. 4/97

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V49002

Material Safety Data Sheet

EPS

Emergency Phone
708-438-1800

Section 1 Product Identification

TRADE NAME	Endorseen 4933	PRODUCT TYPE	Return line treatment	CODE IDENT	15-033
DOT SHIPPING NAME	Alkaline Corrosive Liquid NDS (Contains Morpholine & Cyclohexylamine)				

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Morpholine	110-91-8	< 15	TUA: 20 ppm (skin)
Cyclohexylamine	108-91-8	< 30	TUA: 10 ppm (skin)
Diethylaminoethanol	100-37-8	< 40	TUA: 10 ppm (skin)

* NA 1719

HMIS 2-2-0

Section 3 Physical Data

BOILING POINT (760 mm Hg)	> 150 F	MELTING POINT	NA
FREEZING POINT	- 85 F	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O = 1)	0.95	SOLUBILITY IN H ₂ O	appreciable
VAPOR DENSITY (AIR = 1)	ND	EVAPORATION RATE (H ₂ O = 1)	< 1
% VOLATILES BY VOLUME	ND	pH	12.2

APPEARANCE & ODOR

Clear, pale yellow liquid

Section 4 Fire & Explosion Hazard Data

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
135 F TCC	LOWER UPPER	ND
	ND ND	

EXTINGUISHING MEDIA: WATER FOG FOAM CO₂ DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Extreme heat, open flame

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong acids, oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of carbon & nitrogen

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
Will not occur	Not applicable

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Section 6 Health Hazard Information

TOXICITY INFORMATION:

Exposure level not established for product. See Section 2 for component information. Exposure may occur through skin absorption.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: Harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact will cause irritation and may cause chemical burns. Possible skin sensitizer.

EYE CONTACT: Will cause irritation.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected person to fresh air and treat symptoms.

INGESTION: If conscious, give water to dilute and contact physician immediately.

SKIN CONTACT: Wash with soap & water. Remove contaminated clothing and wash before reuse.

EYE CONTACT: Flush with water for 15 minutes and seek medical attention.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation to remain below exposure criteria.

RESPIRATORY PROTECTION (SPECIFY TYPE)

Use NIOSH/MSHA approved respirator if the exposure criteria is exceeded.

EYE PROTECTION

Chemical goggles and face shield

GLOVES

Impervious

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Long sleeve work shirt and pants, chemical-protective apron

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPOILED

Extinguish all flames in the vicinity. Wear protective clothing including chemical resistant overshoes. Dike spill and soak up on an inert absorbent material. Flush area of spill with water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Product is considered an EPA ignitable hazardous waste, D001 (40 CFR 261)

Product does not contain ingredients with CERCLA reportable quantities.

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed and away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. Ruthe

DATE: 1/24/92

The data contained herein are presented exclusively to W. R. Grace & Co.'s present customers as the most up-to-date information available. No warranty is made for the completeness, accuracy or reliability of the information presented herein and the user assumes all responsibility for its use. No liability is assumed for any damage or loss resulting from the use of this information. W. R. Grace & Co. does not accept any responsibility for the use of this information.

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CANYON INDUSTRIES, INC.
P.O. Box 26447
Tempe, AZ 85285

Phone: 800-255-3423
602-258-2402
Date: May 1, 1990

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

Product Name: AL-5(R) DE-ICING FLUID
General/Generic ID: Glycol-Alcohol Solution

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO	CAS NAME	%Vol	FEL	TLV (UNITS)
Ethylene Glycol*	107-21-1	1,2-Ethanediol	85	50 ppm	50 ppm
Isopropyl Alcohol	67-63-0	2-Propanol	<10	400 ppm	ceiling vapor 400 ppm

*Subject to reporting requirements of Section 313 of SARA Title III

SECTION III - PHYSICAL DATA

PROPERTY	REFINEMENT	MEASUREMENT
Initial Boiling Point	Product	256 deg F (124 deg C) @760 mm Hg
Specific Gravity (H2O=1)		1.095 @ 68 deg F (20 deg C)
Vapor Density	Heavier Than Air	2.5 (Air=1)
Percent Volatiles By Volume	Ingredients with initial Boiling points below 425 deg F	100%
Appearance and Odor		Colorless liquid, faint alcohol odor
Vapor Pressure	Product	9.4 mm Hg @ 68 deg F (20 deg C)
Solubility in Water % by Wt.		100%
Evaporation Rate	Butyl Acetate = 1	>1.00

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***** SECTION IV - FIRE AND EXPLOSION DATA *****

Flash Point: 138 deg F (Pensky-Martens, ASTM 93)
 Flammable Limits
 in Air, % by Volume: Component (lowest) Lower: 2.0 Upper: 12.7
 Extinguishing Media: Water, Fog or Carbon Dioxide or Dry Chemical
 Special Fire Fighting
 Procedures: Do not spray fires directly. A solid stream of water directed into hot, burning liquid can cause frothing. Use self-contained breathing apparatus and protective clothing.
 Unusual Fire and
 Explosion Hazards: None
 NFPA Hazard Rating: Health: 1 Fire: 2 Reactivity: 0

***** SECTION V - HEALTH HAZARD DATA *****

Permissible Exposure Level (PEL): 50 ppm

Threshold Limit Value (TLV): 50 ppm

EFFECTS OF OVEREXPOSURE FOR PRODUCT:

Eyes: Can cause irritation, redness, tearing.
 Skin: Can cause irritation. Prolonged or repeated contact can cause irritation, defatting, dermatitis.
 Breathing: Excessive inhalation of vapors can cause nasal and respiratory irritation.
 Swallowing: May cause abdominal discomfort and pain, dizziness, malaise, lumbar pain, oliguria, uremia, and central nervous system depression. Severe kidney damage accompanies gross overexposure.
 Chronic effects
 of Overexposure: Inhalation of mists may produce signs of central nervous system effects, particularly dizziness and nystagmus.
 Other Health
 Hazards: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

If swallowed: If conscious, give two glasses of water, induce vomiting by sticking finger down throat. Call a physician immediately. Never give anything by mouth to an unconscious person.
 If on skin: Remove contaminated clothing and thoroughly wash exposed area with soap and water. Launder contaminated clothing before reuse.
 If in eyes: Flush with large amounts of water, lifting upper and lower lids occasionally. Get medical attention.
 If inhaled: If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet, and get medical attention.

***** SECTION VI - REACTIVITY DATA *****

HAZARDOUS POLYMERIZATION: Will not occur Conditions to Avoid: None
 STABILITY: Stable Conditions to Avoid: Heat, sparks, and open flames
 INCOMPATIBILITY: Strong oxidizing agents (e.g. nitric and sulfuric acids, permanganates, etc.)
 HAZARDOUS COMBUSTION OR
 DECOMPOSITION PRODUCTS: Burning may produce toxic materials: Carbon dioxide and/or carbon monoxide, etc.

***** SECTION VII - SPILL OR LEAK PROCEDURES *****

STEPS TO BE TAKEN IF MATERIAL

IS RELEASED OR SPILLED:

- Wear suitable protective equipment.
- Small spills should be flushed with large quantities of water.
- Larger spills should be collected for disposal.

WASTE DISPOSAL METHOD:

Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations. See Section IX.

***** SECTION VIII - SPECIAL PROTECTION INFORMATION *****

RESPIRATORY PROTECTION: Self-contained breathing apparatus in high concentrations.

VENTILATION: Provide sufficient mechanical (general) and/or local exhaust ventilation to maintain exposure below TLV (s).

PROTECTIVE GLOVES: Wear resistant gloves such as: Rubber, Plastic, Neoprene, Buna-N.

EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised.

OTHER PROTECTIVE

EQUIPMENT: Eye bath and safety shower.

***** SECTION IX - SPECIAL PRECAUTIONS *****

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Keep away from heat, sparks and open flames.

May be fatal if swallowed.

Do not breathe mist. Avoid prolonged or repeated breathing of vapor.

Avoid contact with eyes.

Wash thoroughly after handling.

Keep container closed. Do not store in open or unlabeled containers.

FOR INDUSTRIAL USE ONLY

OTHER PRECAUTIONS: Where heavy concentrations of a fine mist are present, a respirator should be used to prevent inhaling mist particles. Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in this data sheet must be observed.

The information contained herein is believed to be accurate but is not warranted to be whether originating with Canyon Industries, Inc. or not. The information is presented solely for consideration, investigation, and verification. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

EXERCISE #2: DETERMINING THRESHOLDS MANUFACTURING CASE STUDY

Using the information in the exercise, complete the following tasks to determine which chemicals will require you to prepare a TRI report.

1. Identify each listed Section 313 chemical or chemical category manufactured, processed, and/or otherwise used at the facility that you should evaluate for threshold determinations.
2. Use the attached threshold determination worksheets to determine which toxic chemicals meet or exceed an applicable threshold for manufacture, process, or otherwise use.
3. Prepare Part II, Sections 1, 2 and 3 of Form R for each Section 313 chemical that exceeds an applicable threshold.

Make any necessary assumptions and be prepared to identify the assumptions you have made and the approach you used in completing this exercise.

Facility Description and Chemical Usage

Darcy Corp. operates adjacent plants at a site in central Ohio: Plant 1 manufactures industrial refrigeration units and Plant 2 manufactures molded plastic components for a variety of consumer product applications. Plant 1 employs a staff of 1,600 employees. Plant 2 employs a staff of 800 full-time employees. The two plants operate independently.

Plant 1 uses Hi-Copper Brass Tubing (90.0 percent copper, 9.2 percent zinc) in the manufacture of the air conditioners' components. The tubing is cut, bent into the appropriate shapes, and welded into the air conditioning units. Plant 1 estimates that these activities generate over 0.5 pounds of copper releases to air and water. The purchasing department indicates that Plant 1 received 100,000 pounds of Hi-Copper Brass Tubing in the reporting year.

One of the refrigerants used by Plant 1 in its products is HCFC-22 (>98.0 percent pure). The A100 series of refrigeration units use HCFC-22. In the reporting year, the facility produced 240 of these units, each of which contains 100 pounds of HCFC-22. Information provided by the HCFC-22 supplier indicates that they delivered 20,000 pounds to the site's HCFC-22 storage tank in the reporting year. Inventory records for the HCFC-22 storage tank indicated that the tank contained 15,000 pounds at the beginning of the reporting year and 9,000 pounds at the end of the reporting year.

Plant 1 paints certain refrigeration unit components using a paint that contains 10-weight percent methyl ethyl ketone (MEK), a solvent. Paint booth logs indicate Plant 1 used 110,000 pounds of this paint in these painting operations.

Plant 2 uses a resin in an injection molding process to make various plastic components. Inventory records indicate that the facility used 300,000 pounds of the resin in the reporting year.

The resin contains 4-weight percent of barium hydroxide and 1.5 percent elemental zinc. Information obtained from the vendor indicates that during the curing of the resin, 1 pound of anhydrous ammonia is generated for each 100 pounds of resin used.

Inventory records indicate that 10,000 pounds of an adhesive that contains 12-weight percent MEK was used as a solvent in the adhesive application operations in the reporting year.

In the reporting year, a contractor painted the exterior and interior of all buildings on site. The contractor reported that their paint usage in the reporting year was 20,000 pounds, containing 5-weight percent MEK.

In the reporting year, remediation of soil contaminated with 1,1,1-trichloroethane and 2-butanone (MEK) was conducted with a soil vapor extraction (SVE) system. After being processed through an activated carbon adsorption unit that is 99 percent efficient in capturing the organic emissions, the exhaust from the SVE system is emitted to the air through a stack. The SVE system is estimated to extract from the ground and send to the activated carbon adsorption unit 20 pounds of 1,1,1-trichloroethane and 10 pounds of MEK every month. The carbon is replaced every 10 months and the spent carbon is sent to ACME for incineration.

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

Chemical:

#	Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (lbs.)	Amount of Chemical by Activity (lbs.)		
					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

EXEMPTION SECTION

#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE – EXEMPT)						
REPORTING THRESHOLD						

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

Chemical:

#	Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (lbs.)	Amount of Chemical by Activity (lbs.)		
					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

EXEMPTION SECTION

#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE - EXEMPT)						
REPORTING THRESHOLD						

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

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					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

EXEMPTION SECTION

#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE - EXEMPT)						
REPORTING THRESHOLD						

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

Chemical:

#	Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (lbs.)	Amount of Chemical by Activity (lbs.)		
					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

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#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE - EXEMPT)						
REPORTING THRESHOLD						

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

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					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

EXEMPTION SECTION

#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE – EXEMPT)						
REPORTING THRESHOLD						

THRESHOLD DETERMINATION WORKSHEET

Reporting Year:

Chemical:

#	Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (lbs.)	Amount of Chemical by Activity (lbs.)		
					Manufactured	Processed	Otherwise Used
REPORTABLE SUBTOTAL							

EXEMPTION SECTION

#	Mixture Name or Other Identifier	Exemption	Note Fraction or Percent Exempt (if applicable)	Amount of Chemical by Activity (lbs.)		
				Manufactured	Processed	Otherwise Used
EXEMPT SUBTOTAL						
TOTAL (REPORTABLE – EXEMPT)						
REPORTING THRESHOLD						

EPA FORM R
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 completed 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 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.

(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA																

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed 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:

3.2 Process the toxic chemical:

3.3 Otherwise use the toxic chemical:

a. ☐ Produce b. ☐ Import

If produce or import:

c. ☐ For on-site use/processingd. ☐ For sale/distributione. ☐ As a byproductf. ☐ As an impuritya. ☐ As a reactantb. ☐ As a formulation componentc. ☐ As an article componentd. ☐ Repackaginge. ☐ As an impuritya. ☐ As a chemical processing aidb. ☐ As a manufacturing aidc. ☐ Ancillary or other use**SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR**4.1 (Enter two-digit code from instruction package.)**SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE**

		A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions NA <input type="checkbox"/>			
5.2	Stack or point air emissions NA <input type="checkbox"/>			
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
	Stream or Water Body Name			
5.3.1				
5.3.2				
5.3.3				

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box
 and indicate the Part II, Section 5.3 page number in this box. (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY

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1.2 Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)

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1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.

(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA																	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed 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:

3.2 Process the toxic chemical:

3.3 Otherwise use the toxic chemical:

a. ☐ Produce b. ☐ Import

If produce or import:

c. ☐ For on-site use/processingd. ☐ For sale/distributione. ☐ As a byproductf. ☐ As an impuritya. ☐ As a reactantb. ☐ As a formulation componentc. ☐ As an article componentd. ☐ Repackaginge. ☐ As an impuritya. ☐ As a chemical processing aidb. ☐ As a manufacturing aidc. ☐ Ancillary or other use**SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR**4.1 (Enter two-digit code from instruction package.)**SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE**

		A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>		
5.2	Stack or point air emissions	NA <input type="checkbox"/>		
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
	Stream or Water Body Name			
5.3.1				
5.3.2				
5.3.3				

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box and indicate the Part II, Section 5.3 page number in this box. (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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

EPA FORM R
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 completed Section 2 below.)

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17																			
NA																																			

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed 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:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:
a. <input type="checkbox"/> Produce b. <input type="checkbox"/> Import If produce or import: c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity		a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	<input type="text"/> (Enter two-digit code from instruction package.)
-----	---

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

		A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>		
5.2	Stack or point air emissions	NA <input type="checkbox"/>		
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
	Stream or Water Body Name			
5.3.1				
5.3.2				
5.3.3				

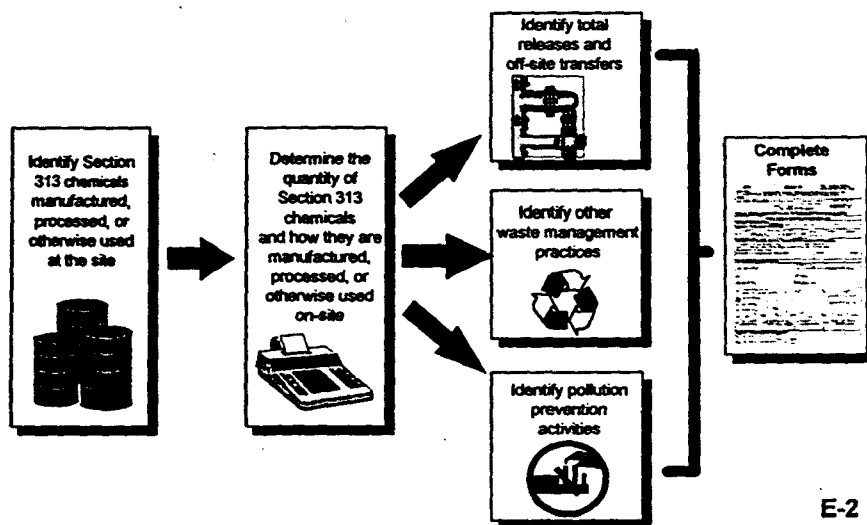
Additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box
 and indicate the Part II, Section 5.3 page number in this box. (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

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

TRI RELEASE AND OTHER WASTE MANAGEMENT REPORTING

THE EPCRA SECTION 313 REPORTING PROCESS



SECTION 313 REPORTING

- **Importance of a structured process for release and other waste management reporting**
 - Ensures accurate data
 - Reduces burden in completing Form R report
 - › Systematic approach reduces redundancy over time
 - › Team approach distributes responsibility
 - Ensures compliance with TRI reporting requirements

E-3

REPORTING METHOD

- **Identify potential release and other waste management sources**
- **Identify available data and tools**
- **Collect data**
- **Estimate quantity of chemical being released and otherwise managed as waste**
- **Document your work**

E-4

TOOLS AND DATA SOURCES FOR CALCULATING REPORTING ESTIMATES

- **Process flow diagrams**
- **Waste management manifests, invoices, and waste profiles**
- **Environmental monitoring data**
- **Permit applications**
- **RCRA (BRS), NPDES, CAA, CERCLA and other env. reports**
- **Engineering calculations and other notes**
- **EPA guidance**

E-5

CALCULATING REPORTING ESTIMATES

- **Consider all sources (routine and non-routine)**
- **Reasonable estimates are required by law**
- **Facility determines best approach**
- **Data and approach must be documented**

E-6

TECHNIQUES FOR ESTIMATING CHEMICAL QUANTITIES

- **Use of monitoring data (M)**
- **Mass balance calculation (C)**
- **Use of emission factors (E)**
- **Engineering calculations (O)**
- **Use the code on the Form R for the method used to estimate the largest portion of the release**

E-7

ANALYSIS OF MONITORING DATA

- **Product of measured concentrations, volumetric flow rates, and density equals pounds of chemical released per year**
- **Most commonly used for wastewater (Discharge monitoring reports (DMRs))**
- **Use Basis of Estimate code "M" if calculations based primarily on monitoring data**

E-8

MASS BALANCE CALCULATION

- **Mass Balance is based on the law of conservation of mass**
- **Input + Generation = Output + Amount Reacted + Accumulation**
- **Most useful in simple situations**
- **Use Basis of Estimate code "C"**
 - **Example: Estimating wastewater releases from process**

E-9

USE OF PUBLISHED EMISSION FACTORS

- **Emission factors are used to describe the quantity of chemical released as a function of:**
 - **Specific chemical used**
 - **Specific process used**
 - **Specific equipment used**
- **Available in *Compilation of Air Pollutant Emission Factors (AP-42)***
- **Use Basis of Estimate code "E" only when chemical-specific emission factor is used**

E-10

ENGINEERING CALCULATIONS

- **Calculations based on best engineering judgment/assumptions**
- **Calculations based on process knowledge**
- **Use of non-chemical-specific emission factors**
- **Use of non-published emission factors**
- **Use Basis of Estimate code "O"**

E-11

NON-PBT CHEMICAL ESTIMATES

- **Values for non-PBT Section 313 chemicals must be entered in whole numbers**
 - **EPA allows using two significant figures when reporting releases and other waste management estimates**
 - **If estimate is more precise, additional significant figures should be used based on precision of data used to calculate the estimate**
 - **For estimates of non-PBT Section 313 chemicals under 1,000 pounds, a range code can be used:**
 - » **A = 1-10 pounds; B = 11-499 pounds; C = 500-999 pounds**

E-12

“NA” VS. “0”

- Use “NA” (not applicable) when no possibility of the Section 313 chemical being released to or otherwise managed as waste in that media (e.g., facility has no on-site landfill) or when no release to or other waste management in the specific media occurs
- Use “0” when no release occurs or ≤ 0.5 pounds of a non-PBT Section 313 chemical from a waste stream is directed towards that medium
 - Example: Discharge to water is zero; however, release possible if control equipment fails
 - Must indicate a Basis of Estimate code (i.e., M, C, E, O) for all numerical estimates, including “0”

E-13

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

- Insert appropriate code from instructions indicating the maximum quantity on-site
- Use maximum total amount present at one time during reporting year, even if the Section 313 chemical is present at more than one location at the facility
- Include amounts in storage, processes, and wastes (but not those amounts which have been previously land disposed)

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR			
4.1	<table border="1"><tr><td><input type="text"/></td><td>(Enter two-digit code from instruction package.)</td></tr></table>	<input type="text"/>	(Enter two-digit code from instruction package.)
<input type="text"/>	(Enter two-digit code from instruction package.)		

E-14

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

- **Part II, Section 4.1: Maximum amount on-site at any time during the calendar year**
 - Based on amount in storage, process, and wastes
 - Not the same as Tier II maximum amount on site
 - » Tier II is usually by mixtures, Form R is chemical-specific
 - » Tier II excludes hazardous wastes, Form R does not
- **Data sources**
 - Tier II records/calculations
 - Waste inventory data

E-15

PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- **Report total releases of the Section 313 chemical to each environmental medium on-site**
- **In column A, Total Release, report total quantity**
 - A range code can be used for non-PBT Section 313 chemical quantities less than 1,000 pounds
 - » A = 1 - 10 pounds
 - » B = 11 - 499 pounds
 - » C = 500 - 999 pounds

E-16

PART II. SECTION 5: ON-SITE AIR EMISSIONS

■ Section 5.1 Fugitive or non-point air emissions

- Enter total fugitive releases of the Section 313 chemical in column A, including leaks, evaporative losses, building ventilation, or other non-point air emissions

■ Section 5.2 Stack or point air emissions

- Enter total releases to air from point sources, including stacks, vents, pipes, ducts, storage tanks, or other confined air streams

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM					
			A. Total Release (pounds/year) (enter range from monitoring or estimate)	B. Basis of Estimate (enter code)	C. % From Storage
5.1	Fugitive or non-point air emissions	<input type="checkbox"/> NA			
5.2	Stack or point air emissions	<input type="checkbox"/> NA			

E-17

FUGITIVE EMISSIONS

■ Part II, Section 5.1: Fugitive or non-point air emissions

- Approach: ID potential sources → ID data/tools → estimate

■ Data sources/tools

- Engineering calculations
- Emission factors
- Monitoring data
- Mass balance

E-18

STACK EMISSIONS

■ Part II, Section 5.2: Stack or point-source air emissions

- Approach: ID potential sources → ID data/tools → estimate
- Data sources/tools
 - › Air permit applications
 - › CAA Title V air inventories
 - › Process and production data
 - › Engineering calculations
 - › Mass balance
 - › Emission factors

E-19

PART II. SECTION 5: ON-SITE WASTEWATER DISCHARGES

■ Section 5.3 Releases to streams or water bodies

- Enter names of streams or water bodies to which your facility directly discharges the Section 313 chemical. If there is no name, enter the closest stream or water body with a name
- Enter total amount of releases to each receiving stream or water body in column A; include amounts from stormwater runoff, if available
- Indicate in column C the percentage of the total quantity (by weight) of the Section 313 chemical contributed by stormwater

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM				
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
	Stream or Water Body Name	A. Total Release (pounds/year) (enter range from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.3.1				
5.3.2				

E-20

WASTEWATER DISCHARGES

- **Part II, Section 5.3: Release to stream or water body and Part II, Section 6.1: Discharges to POTW**
 - Approach: ID potential sources → ID data/tools → estimate
- **Potential release sources**
 - Wastewater treatment facility discharge
 - Storm drains
- **Data/tools**
 - Monitoring, if available
 - DMRs or other required monitoring data
 - NPDES permits/permit applications
 - Process knowledge and/or mass balance

E-21

CALCULATING WASTEWATER DISCHARGES

- **Recommended approach: Calculate the yearly pounds of methanol discharged using the following data concerning wastewater discharges of methanol:**

<u>Date</u>	<u>Conc. (mg/L)</u>	<u>Flow (MGD)</u>	<u>Amt.(lbs./day)</u>
3/1	1.0	1.0	8.33
9/8	0.2	0.2	<u>.33</u>

Average = 4.33

$(4.33 \text{ lbs./day}) \times (365 \text{ days/yr.}) = 1581 \text{ lbs./yr.}$

MGD = million gallons per day

1 mg/L = 8.33 lbs./million gal

E-22

PART II. SECTION 5: ON-SITE INJECTION WELLS

- **Section 5.4.1 Underground injection to Class I wells**
 - Enter total amount of Section 313 chemical injected into Class I wells at facility in column A and basis of estimate code in column B
- **Section 5.4.2 Underground injection to Class II - V wells**
 - Enter total amount of Section 313 chemical injected into Class II - V wells at facility in column A and basis of estimate code in column B

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM				
			A. Total Release (pounds/year) (enter range from instructions or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground injections on-site to Class I Wells	<input type="checkbox"/> NA		
5.4.1	Underground injections on-site to Class II-V Wells	<input type="checkbox"/> NA		

E-23

PART II. SECTION 5: RELEASES TO LAND ON-SITE

- **Section 5.5 Releases to land on-site**
 - Other disposal (5.5.4) includes spills or leaks of the Section 313 chemical to land
 - Quantities of Section 313 chemicals released to air or water during the reporting year of the initial release to land (e.g., volatilization from surface impoundments) are not included here

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM				
			A. Total Release (pounds/year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)
5.5	Disposal to land on-site	NA		
5.5.1A	RCRA Subtitle C landfills	<input type="checkbox"/>		
5.5.1B	Other landfills	<input type="checkbox"/>		
5.5.2	Land treatment/application farming	<input type="checkbox"/>		
5.5.3	Surface impoundment	<input type="checkbox"/>		
5.5.4	Other disposal	<input type="checkbox"/>		

E-24

RELEASED TO LAND ON-SITE

- **Approach: ID potential sources → ID data/tools → estimate**
- **Potential sources of release to land**
 - Intentional storage or disposal in on-site units
 - Spills
 - Leaks
- **Data/tools:**
 - Operating records/analytical data
 - Spill reports
 - Process knowledge

E-25

CHEMICAL MIGRATION GUIDANCE

- **Migration of reportable chemical within one environmental medium (e.g., from land to land: landfill leaching into soil)**
 - Only required to report initial release of chemical to the environment
- **Migration of chemical from one environmental medium to another (e.g., from land to air: volatilization from a lagoon) within the reporting year**
 - Release estimates should be calculated and reported for all media in Part II, Sections 5, 6, and 8 of Form R

E-26

WASTE RELEASED TO LAND ON-SITE-- STORAGE

■ Storage of wastes on the land

- **Regular shipment schedule**
 - » **Must transfer the waste off-site before that reporting year's Form R report is submitted or July 1, whichever comes first**
 - » **Report material transferred off-site during the year in Part II, Section 6 of Form R**
- **No regular shipment schedule**
 - » **Report material added to pile that remains on-site during the year as the quantity released to land, Part II, Section 5.5.4 of Form R**

E-27

PART II. SECTION 6: TRANSFERS TO OFF- SITE LOCATIONS

- **Includes both off-site location information and quantities of Section 313 chemicals transferred to off-site locations**
- **Report quantities of a Section 313 chemical sent off-site to any POTW or other location for recycling, energy recovery, waste treatment, or disposal**
- **Report only total quantity of a Section 313 chemical transferred off-site, not entire waste**
- **In Sections 6.1 and 6.2, Total Transfers, report total quantity**
 - **A range code can be used for non-PBT Section 313 chemical quantities less than 1,000 pounds**
 - » **A = 1 - 10 pounds**
 - » **B = 11 - 499 pounds**
 - » **C = 500 - 999 pounds**

E-28

PART II. SECTION 6: TRANSFERS TO POTWs

■ Section 6.1 Discharges to publicly owned treatment works

- Enter total quantity of the Section 313 chemical transferred to all POTWs and basis of estimate

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS	
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)	
6.1.A Total Quantity Transferred to POTWs and Basis of Estimate	
6.1.A.1 Total Transfers (pounds/year) <small>(enter range code or estimate)</small>	6.1.A.2 Basis of Estimate <small>(enter code)</small>

E-29

PART II. SECTION 6: TRANSFERS TO POTWs

■ Section 6.1.B POTW name and location

- Include name and address of each POTW
- Photocopy page 3 if reporting discharges to more than 2 POTWs (ATRS accommodates this without photocopying)

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS					
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)					
6.1.B.	---	POTW Name			
POTW Address					
City		State		County	
Zip					
6.1.B.	---	POTW Name			
POTW Address					
City		State		County	
Zip					

E-30

PART II. SECTION 6: TRANSFERS TO OTHER OFF-SITE LOCATIONS

■ Section 6.2 Transfers to other off-site locations

- Include name, address, and EPA identification (RCRA ID) number
- Enter quantities, basis of estimate, and codes for multiple activities (waste treatment, disposal, recycling, and energy recovery) in Rows 1 through 4
- Photocopy page 4 if reporting more than 2 off-site transfer locations (ATRS accommodates this without photocopying)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS									
6.2 OFF-SITE EPA IDENTIFICATION NUMBER (RCRA ID NO.)									
Off-site Location Name									
Off-site Address									
City	State			County		Zip	Country (Non-US)		
Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> 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			

E-31

OFF-SITE WASTE MANAGEMENT

■ Approach: ID potential sources → ID data/tools → estimate

■ Potential sources of off-site waste management

- Identify final disposition of the Section 313 chemical
 - » Disposal
 - » Waste treatment
 - » Energy recovery
 - » Recycling

■ Data/tools

- Waste manifests and vendor receipts
- RCRA reports
- Waste characterization - analyses, profiles

E-32

PART II. SECTION 7: ON-SITE WASTE MANAGEMENT

Examples of on-site waste management (Section 7)

- Air pollution control devices (Section 7A)
- Wastewater treatment processes (Section 7A)
- Energy recovery devices (Section 7B)
- Recycling devices (Section 7C)

E-33

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

- Report each waste treatment method that the Section 313 chemical undergoes
 - Include even if method has no effect on the Section 313 chemical
- Only data element in Form R focusing on the entire waste stream rather than the Section 313 chemical in the waste stream

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY					
<input type="checkbox"/> Not Applicable (NA) - Check here if <u>no</u> 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
7A.1a	7A.1b	1 <input style="width: 40px;" type="text"/>	2 <input style="width: 40px;" type="text"/>	7A.1c	7A.1d
	3 <input style="width: 40px;" type="text"/>	4 <input style="width: 40px;" type="text"/>	5 <input style="width: 40px;" type="text"/>		7A.1e
	6 <input style="width: 40px;" type="text"/>	7 <input style="width: 40px;" type="text"/>	8 <input style="width: 40px;" type="text"/>		% Yes <input type="checkbox"/> No <input type="checkbox"/>

E-34

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

■ Section 7A.a General waste stream

- Enter a waste stream code for each waste treatment method sequence
 - There are four waste stream types: Gaseous, Wastewater, Liquid Waste, Solid Waste

■ Section 7A.b Waste treatment method(s) sequence

- Enter code(s) from EPA's *TRI Reporting Forms and Instructions* document for on-site waste treatment method(s) used
- Enter code(s) regardless of whether waste treatment actually affected the Section 313 chemical
- Report waste treatment method(s) used on aggregate waste stream as single stream
- If applicable, enter codes in sequence in which they occur

E-35

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

■ Section 7A.c Range of influent concentration

- Use range of concentration of the Section 313 chemical in waste stream as it typically enters treatment equipment
- Enter code(s) for concentration ranges (parts per million) from EPA's *TRI Reporting Forms and Instructions* document

■ Section 7A.d Waste treatment efficiency estimate

- Waste treatment efficiency expressed as percent removal of the Section 313 chemical from waste stream through biological degradation, chemical conversion, or physical removal
 - Use overall efficiency of waste treatment sequence, not a specific waste treatment method
 - Use percent removal of Section 313 chemical only, not other constituents of the waste stream

E-36

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

■ Section 7A.e Based on Operating Data?

- Check "yes" if efficiency estimate is based on monitoring from typical operating conditions
- Check "no" if efficiency estimate is based on published data for similar processes or equipment supplier's literature, or if the influent or effluent waste comparison or the flow rate was otherwise estimated

E-37

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

■ Procedures for using two lines of data to enter 9 or more sequential waste treatment methods

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY											
<input type="checkbox"/> Not Applicable (NA) - Check here if <u>no</u> 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	P12	2	P18	7A.1c	7A.1d	7A.1e			
W	3	P17	4	P61	5	P42	NA	%	Yes	No	
	6	P21	7	P21	8	P11			<input type="checkbox"/>	<input type="checkbox"/>	
7A.2a	7A.2b	3	C44	2	NA	7A.2c	7A.2d	7A.2e			
	3		4		5		1	99 %	Yes	No	
	6		7		8				<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7A.3a	7A.3b	1	A01	2	NA	7A.3c	7A.3d	7A.3e			
A	3		4		5		1	91 %	Yes	No	
	6		7		8				<input checked="" type="checkbox"/>	<input type="checkbox"/>	

E-38

PART II. SECTION 7B: ON-SITE ENERGY RECOVERY PROCESSES

- Enter on-site energy recovery methods for Section 313 chemical
 - Section 313 chemical must be combustible and have a significant heating value (e.g., 5,000 BTU/lb.)
 - Combustion unit is integrated into an energy recovery system (e.g., industrial furnace, industrial kiln, or boiler)
- Enter codes in descending order by quantities combusted

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES				
<input type="checkbox"/> 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	<input type="text"/>	2	<input type="text"/>	3
			<input type="text"/>	4
				<input type="text"/>

E-39

PART II. SECTION 7C: ON-SITE RECYCLING PROCESSES

- Enter methods used for on-site recycling of the Section 313 chemical
 - Codes for recycling methods used are found in EPA's *TRI Reporting Forms and Instructions* document
 - Do not include energy recovery processes
- Enter codes in descending order by quantities recycled

SECTION 7C. ON-SITE RECYCLING PROCESSES									
<input type="checkbox"/> 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	<input type="text"/>	2	<input type="text"/>	3	<input type="text"/>	4	<input type="text"/>	5	<input type="text"/>
6	<input type="text"/>	7	<input type="text"/>	8	<input type="text"/>	9	<input type="text"/>	10	<input type="text"/>

E-40

PHOTOCOPYING PAGES OF FORM R

- **Form R pages may be photocopied if additional space is necessary to complete these sections (photocopying is not necessary with ATRS)**
 - Section 6.1: Transfers to POTWs
 - Section 6.2: Transfers to Other Off-Site Locations
 - Section 7A: Waste Treatment Methods and Efficiency
- **When photocopying pages, you must complete the box on each page to indicate the number of copies you are attaching**
- **For the page being photocopied, enter in the left box the total number of pages submitted including the original**
 - original + number photocopied = total pages submitted**
 - In the second box, indicate the position of the individual page

Example:

If additional pages of Part II, Sections 6.2/7A are attached, indicate the total number of pages in this box [2] and indicate which Part II, Sections 6.2/7A page this is, here, [3] (example: 1,2,3, etc.)

E-41

BEST PRACTICE: RECORDKEEPING

- **Importance of good recordkeeping**
 - Detailed records improve reporting accuracy and data quality
 - Well-labeled calculations and engineering assumptions serve as standard operating procedures for future years
 - › Reduce replication
 - › Ensure consistency
- **Requirements**
 - All records used to complete Form R reports must be kept for three years (40 CFR 372.10)
 - EPA will review records during a data quality audit

E-42

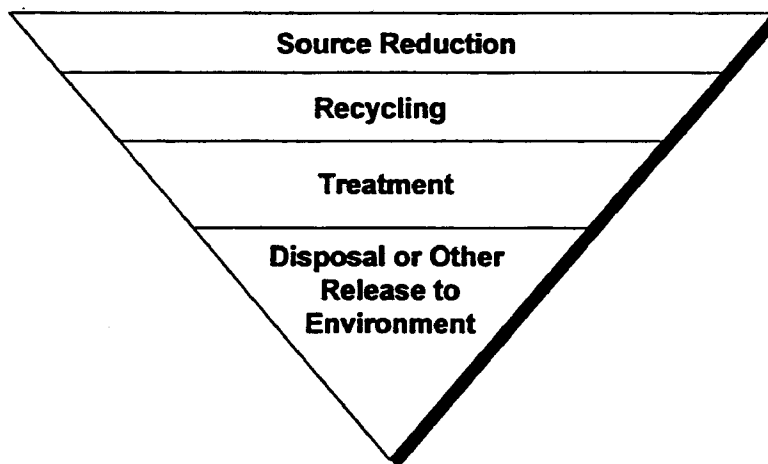
REFERENCE SOURCES

- *Estimating Releases and Waste Treatment Efficiencies*
- EPA Industry Guidance located at <http://www.epa.gov/tri>
- *AP-42: Compilation of Air Pollutant Emission Factors* located at <http://www.epa.gov/ttn/chief>
- Technology Transfer Network located at <http://www.epa.gov/ttn>
 - AP-42
 - WATER9 program
 - › Updates WATER8, CHEMDAT8, and CHEM9
 - TANKS program
- *Perry's Chemical Engineer's Handbook; CRC Handbook of Chemistry and Physics; Lange's Handbook of Chemistry*

OVERVIEW OF POLLUTION PREVENTION REPORTING



POLLUTION PREVENTION HIERARCHY



THINGS TO REMEMBER WHEN COMPLETING SECTION 8

■ Key concepts

- **Waste streams**
- **Process streams**
- **Reportable recycling**
- **Source reduction activities**

■ Develop consistent definitions for key terms

- **Across facility**
- **Across agency/company**

F-3

RELEASES AND OTHER WASTE MANAGEMENT

■ Part II, Sections 8.1 through 8.7 of Form R

- **Column A - Prior Reporting Year Estimate**
- **Column B - Current Reporting Year Estimate**
- **Column C - Next Reporting Year Projection**
- **Column D - Following Reporting Year Projection**

F-4

■ Insert Form R (Page 5) here.

F-5

■ Insert Form R (Page 5) here.

F-6

RELEASES AND OTHER WASTE MANAGEMENT

■ Part II, Sections 8.1 through 8.7 of Form R

- Quantity of a Section 313 chemical reported in Sections 8.1 through 8.7 does not include releases (including on-site and off-site disposal) and other off-site waste management activities resulting from remedial actions, catastrophic events, or one-time events not associated with production process. These quantities should be reported in Section 8.8 only

F-7

RELEASES

■ Section 8.1: Quantity released

- Quantity of a Section 313 chemical "released"
 - » Definition of release: "...any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing...into the environment..." (EPCRA Section 329(8))
 - » Includes fugitive and stack air emissions, releases to land, releases to water, underground injections, and on-site and off-site disposal
 - » Includes metals in wastes sent to a POTW (metals cannot be destroyed)

F-8

RELEASES

■ Section 8.1: Quantity released (continued)

- **Section 8.1 = Sections 5 + 6.2 (disposal only) + 6.1 (for metals and metal compounds only) - 8.8 (release or off-site disposal only)**
- **Possible data sources**
 - » **Data and calculations from Sections 5 and 6 of Form R**

F-9

ENERGY RECOVERY

■ Sections 8.2 and 8.3: On-site and off-site energy recovery

- **Things to remember about energy recovery**
 - » **Combustion unit (e.g., industrial furnace, industrial kiln, or boiler) must be integrated into an energy recovery system**
 - » **Section 313 chemical must have significant heating value (e.g., 5,000 BTU/lb.)**
 - » **Section 313 chemicals that are, or are contained in, traditional fuels should not be reported as combusted for energy recovery**

F-10

ENERGY RECOVERY

■ Section 8.2: On-site energy recovery

- Quantity of Section 313 chemical used for energy recovery on-site
 - » Quantity *actually* combusted in the energy recovery unit
- *not* the quantity entering the unit
- A code reported in Section 7B indicates that an estimate should be calculated for Section 8.2
- Possible data sources
 - » Engineering process specifications
 - » Mass balance calculations
 - » Best engineering judgement

F-11

ENERGY RECOVERY

■ Section 8.3: Off-site energy recovery

- Quantity of Section 313 chemical that is *transferred* off-site for energy recovery
 - » Includes total quantity of Section 313 chemical *transferred* off-site for energy recovery purposes - *not* quantity actually combusted off-site
- Possible data sources
 - » Section 6.2 (codes M56 and M92) of Form R
 - » Receipts from off-site facilities
 - » RCRA hazardous waste manifests

F-12

RECYCLING

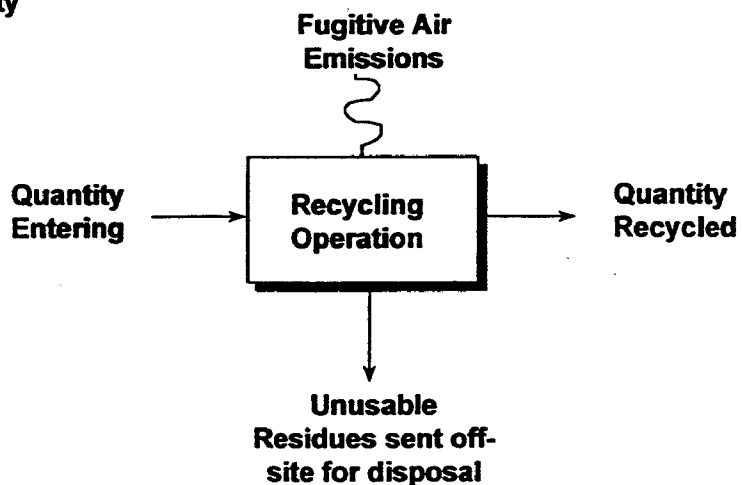
■ Section 8.4: On-site recycling

- Quantity of Section 313 chemical recycled on-site
 - › Includes total quantity of Section 313 chemical *recovered* from the recycling process and made available for further use
- Possible data sources
 - › Engineering process specifications
 - › Mass balance calculations
- A code reported in Section 7C indicates that an estimate should be calculated for Section 8.4

F-13

CALCULATING QUANTITY RECYCLED IN SECTION 8.4

Facility



F-14

RECYCLING

■ Section 8.5: Off-site recycling

- Quantity of Section 313 chemical *transferred off-site* for recycling
 - » Includes total quantity of Section 313 chemical *transferred* to off-site locations for recycling
- Possible data sources
 - » Section 6.2 of Form R (only for recycling destinations)
 - » Receipts from off-site recycling facilities
 - » RCRA hazardous waste manifests
 - » RCRA hazardous waste report (BRS)

F-15

WASTE TREATMENT

■ Section 8.6: Quantity treated on-site

- Quantity of Section 313 chemical *treated on-site*
 - » Includes all quantities of Section 313 chemical destroyed
- Possible data sources
 - » Calculations used to complete Section 7A of Form R
 - Remember to include quantities that are actually destroyed (or converted to a non-listed form), not just removed from the waste stream

F-16

WASTE TREATMENT

■ Section 8.7: Off-site waste treatment

- The amount of Section 313 chemical that is *transferred* off-site for waste treatment
 - » Includes all quantities of Section 313 chemical *transferred* to off-site facilities for waste treatment
- Possible data sources
 - » Sections 6.1 and 6.2 (i.e., off-site transfers for waste treatment)
 - Important: Assume all Section 6.1 quantities are treated, except metals and metal compounds

F-17

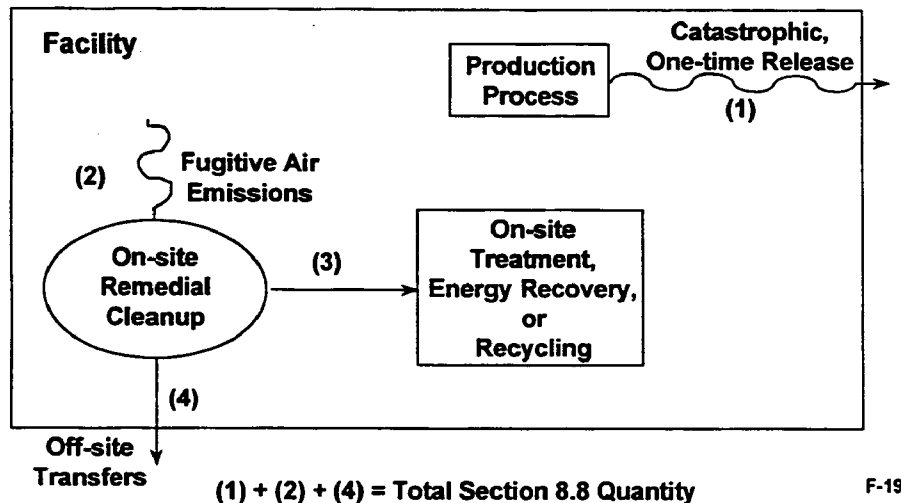
REMEDIAL, CATASTROPHIC, OR ONE-TIME RELEASES

■ Section 8.8: Remedial, catastrophic, or one-time releases

- Quantity of Section 313 chemical released into the environment or transferred off-site as a result of:
 - » Remediation
 - » Catastrophic events (e.g., earthquake, hurricane, fire, floods)
 - » One-time events not associated with production processes (e.g., pipe rupture due to unexpected weather)
- Does not include Section 313 chemicals treated, recovered for energy, or recycled ON-SITE
- Excludes quantities in Sections 8.1 through 8.7

F-18

CALCULATING QUANTITY REPORTED IN SECTION 8.8



REMEDIAL, CATASTROPHIC, OR ONE-TIME RELEASES

■ Section 8.8 (continued)

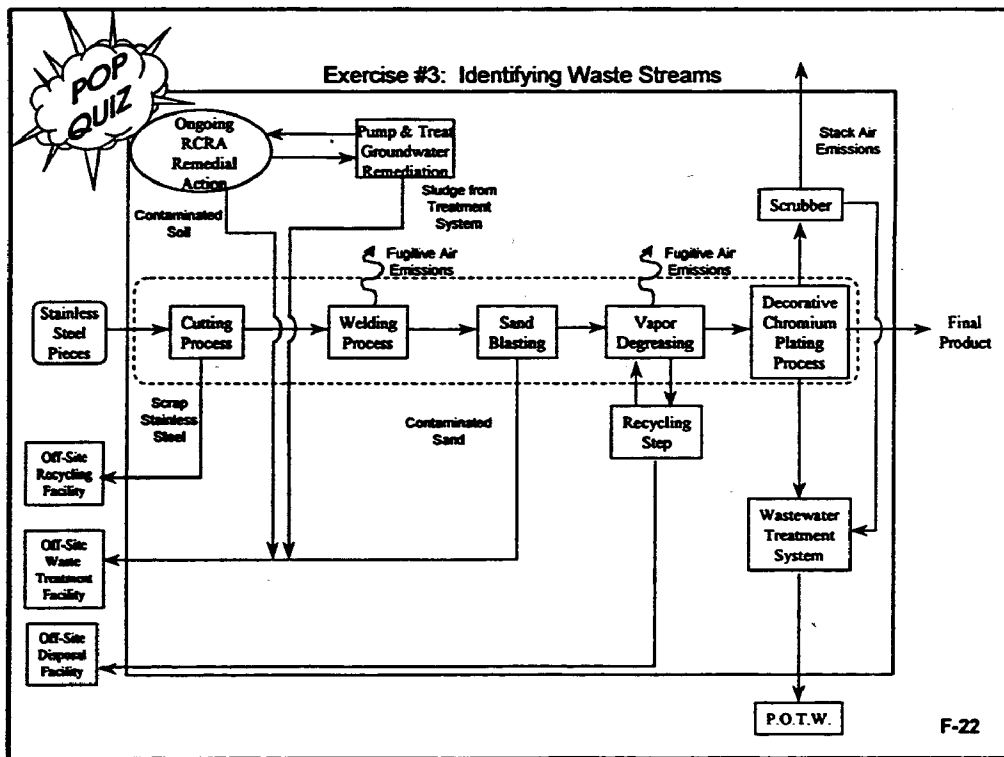
- Possible data sources
 - » Quantities reported in Part II, Sections 5 and 6
 - » Accident investigation reports
 - » Inventory reconciliation
 - » Mass balance calculations
 - » Monitoring reports (e.g., pH, discharge monitoring reports, continuous emissions monitoring)
 - » CERCLA reports filed with the National Response Center
 - » Release notification reports required under EPCRA Section 304

SOURCE REDUCTION AND OTHER WASTE MANAGEMENT ACTIVITIES

■ Important points regarding Sections 8.1 through 8.8

- Sum of the quantities in Sections 8.1 through 8.7 equals the total quantity of the Section 313 chemical “entering any waste stream (or otherwise released into the environment) prior to recycling, treatment, or disposal.” (PPA Section 6607(b)(1))
- Quantities reported in Sections 8.1 through 8.7 are exclusive of each other
- Sum of Sections 8.1 through 8.7 is mutually exclusive of the quantity in Section 8.8

F-21



PRODUCTION RATIO OR ACTIVITY INDEX

■ Section 8.9: Production ratio or activity index

- A ratio of production or activity involving the Section 313 chemical in the reporting year to production or activity in the previous year
- Allows quantities of the Section 313 chemical reported in Sections 8.1 through 8.7 in the current year to be compared to quantities reported in the prior year
- Production ratio or activity index is determined by dividing the level of production (or activity) in the current year by the level of production (or activity) in the prior year
- Select methodology least likely to be affected by potential source reduction activities

F-23

PRODUCTION RATIO

■ Use production ratio if Section 313 chemical usage is related to a production level

- Equation

$$\frac{\text{Quantity of Product: Current Reporting Year}}{\text{Quantity of Product: Prior Reporting Year}}$$

Example:

Oven manufacturing

$$\frac{40,000 \text{ ovens assembled (Current RY)}}{35,000 \text{ ovens assembled (Prior RY)}} = 1.14$$

F-24

ACTIVITY INDEX

- Use activity index if Section 313 chemical usage is related to an activity and not to a production level

- Equation

Level of Activity : Current Reporting Year

Level of Activity: Prior Reporting Year

Example:

Tank washouts

$$\frac{60 \text{ Washouts (Current RY)}}{50 \text{ Washouts (Prior RY)}} = 1.2$$

F-25

PRODUCTION RATIO OR ACTIVITY INDEX

- Possible data sources

- Production reports
- Maintenance records for otherwise used chemicals
- Waste minimization section of the RCRA hazardous waste report
- State/corporate pollution prevention reports

F-26

SOURCE REDUCTION ACTIVITIES

■ Section 8.10

- **Source reduction practices used with respect to the Section 313 chemical at the facility and the methods used to identify those activities**
- **This section includes only those source reduction activities implemented during the reporting year**
 - » **Only include activities that reduce or eliminate quantities reported in Sections 8.1 through 8.7**

F-27

SOURCE REDUCTION ACTIVITIES

■ Section 8.10 (continued)

- **Possible data sources**
 - » **Standard operating procedures**
 - » **Process changes or equipment changes (e.g., replacements, adjustments)**
 - » **Raw material changes**
 - » **Work orders for process changes**
 - » **Product redesign specifications**
 - » **Audit reports and follow-up actions**
 - » **Waste minimization section of the RCRA hazardous waste report**
 - » **State/corporate pollution prevention reports**

F-28

OPTIONAL INFORMATION

■ Section 8.11

- **Facility should indicate whether additional optional information on source reduction, recycling, or pollution control activities is included with the report**
- **A one-page summary is encouraged**
- **Facility can provide information on previous years' activities**
- **EPA and others use this information for granting awards and recognition to companies and employees**

FORM A SUBMISSION

ALTERNATE THRESHOLD RULE

- **If alternate threshold criteria met:**
 - No Form R report
 - No release, other waste management, or source reduction reporting
 - Submit certification statement (Form A) each year
- **Final rule published in 1994 (§372.27; November 30, 1994; 59 FR 61501)**
- **Does not apply to PBT chemicals**



United States
Environmental Protection Agency

TOXIC CHEMICAL RELEASE INVENTORY
FORM A

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 _____

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2; Go to Section 3)

2.2 Is this copy ☐ Sanitized ☐ Unsanitized
(Answer only if "YES" in 2.1)

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

I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in the statement, the annual reportable amount as defined in 40 CFR 372.27 (a), did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year.

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

Signature:

Date Signed:

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number

Facility or Establishment Name

Facility or Establishment Name or Mailing Address (if different from street address)

Street

Mailing Address

City/County/State/Zip Code

City/State/Zip Code

Country (Non-US)

4.2 This report contains information for: (Important: check c or d if applicable)
c. ☐ A Federal facility d. ☐ GOCO

4.3 Technical Contact Name

Telephone Number (include area code)

4.4 Intentionally left blank

4.5 SIC Code (s) (4 digits)

Primary

a. b. c. d. e. f.

4.6 Latitude

Degrees Minutes Seconds

Longitude

Degrees Minutes Seconds

4.7 Dun & Bradstreet Number(s) (9 digits)

4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)

4.9 Facility NPDES Permit Number(s) (9 characters)

4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)

a. b. a. b. a. b. a. b.

SECTION 5. PARENT COMPANY INFORMATION

5.1 Name of Parent Company NA ☐

5.2 Parent Company's Dun & Bradstreet Number NA ☐

EPA FORM A

PART II. CHEMICAL IDENTIFICATION

TRIFID:

Do not use this form for reporting PBT chemicals including Dioxin and Dioxin-like Compounds*

SECTION 1. TOXIC CHEMICAL IDENTITY

Report ____ of ____

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 1, 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 completed Section 1 above.)

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

SECTION 1. TOXIC CHEMICAL IDENTITY

Report ____ of ____

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 1, 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 completed Section 1 above.)

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

SECTION 1. TOXIC CHEMICAL IDENTITY

Report ____ of ____

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 1, 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 completed Section 1 above.)

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

SECTION 1. TOXIC CHEMICAL IDENTITY

Report ____ of ____

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 1, 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 completed Section 1 above.)

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

* See the TRI Reporting Forms and Instructions Manual for the list of PBT Chemicals (including Dioxin and Dioxin-like Compounds)

ALTERNATE THRESHOLD RULE

■ Criteria for submitting a Form A

- Do not exceed 1,000,000 pounds manufactured, processed, or otherwise used; and
- Do not exceed 500 pounds for the total annual reportable amount for a Section 313 chemical. Equivalent to the sum of the quantities calculated for Sections 8.1 - 8.7 of the Form R

G-7

POP QUIZ

- You manufacture 100,000 pounds of a non-PBT Section 313 chemical. You sell 99,950 pounds as a product. You emit 25 pounds out a stack, and send 25 pounds off-site for disposal. Do you meet the criteria for submitting a Form A?
- You use 50,000 pounds of nitric acid as a cleaner. The entire amount is neutralized in your on-site wastewater treatment operation and there are no air or water releases. Do you meet the criteria for submitting a Form A?

G-8

ALTERNATE THRESHOLD RULE

■ Recordkeeping

- All documentation to support the determination, including:
 - » Detailed records
 - » Well-labeled calculations and assumptions
- All records used to determine eligibility to file the Form A must be kept for a period of 3 years from the date of the submission of the certification statement (§372.10(d))

G-9

OVERVIEW: FORM R VS. FORM A

■ Form R

- Standard reporting method
- For all Section 313 chemicals
- Report releases, other waste management, and source reduction activities
- Recordkeeping requirements

■ Form A

- Alternate certification statement
- Not allowed for PBT chemicals
- Use for total reportable amounts not exceeding 500 pounds
- Recordkeeping requirements

G-10