Annual Toxics Reporting Skills and Challenges

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Spring 2025 Reporting Workshop

Before You Get Started

Make sure you know	Which chemicals are on the TURA & TRI reporting lists (use DEP's Excel spreadsheet or the TRI GuideMe list)
	Which chemicals are PBT, HHS or LHS (refer to DEP's spreadsheet)
	What the reporting thresholds are for each chemical and chemical category (refer to DEP's spreadsheet or use the TRI threshold screening tool)
Gather all the data you need to quantify chemical use at your facility	Purchasing, storage, shipping and waste data
	Permit and emissions data
	Current Safety Data Sheets (SDS)
Do not assume reporting done in the past was correct	Challenge assumptions made
	Determine if additional sources of data are available

Key differences between TURA and TRI reporting

Aspect of Reporting	Massachusetts TURA	US EPA TRI
Covered facilities (SIC)	• 20-39 – Manufacturing • 40-51 – includes Transportation, Communications, Wholesale Trade • 72&73 – Personal & Business Services • 75&76 – Repair Services	• 20-39 – Manufacturing • 40, 44-48, 50, 72 & 76 – Exempt • 49 – Only coal burning (power & haz waste mgmt.) • 51 – Only chemicals & allied products, petroleum bulk stations & terminals • 73 – Only solvent recovery
Covered chemicals	Find the full list here: https://www.mass.gov/doc/complete-list-of-tura-chemicals/download = TRI-listed chemicals plus: • CERCLA chemicals • Ag, Cu, Ni, Cr, Co, Mn, Ag-Cu alloys only reportable when in aerosol form • IPA and hydroquinone (only if mfd) • Other TURA additions (e.g., C1-C4, crystalline silica, certain PFAS, etc)	• Find the full list here: https://www.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals • HCl and H_2SO_4 only reportable when in aerosol form
Report format	Form S + State-Only Form R/A for chemicals not reportable under TRI	Form R or Form A

Important Reporting Practices

Evaluate chemicals previously reduced below thresholds in the previous year

Check for use of chemicals identified by different names/synonyms

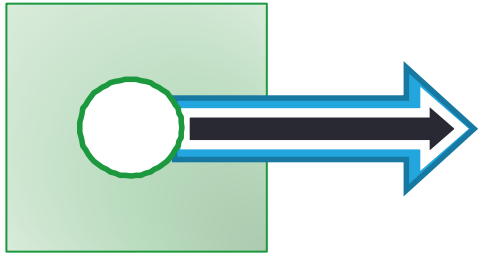
Evaluate **all** processes where the chemical is used when determining the quantity of chemical use

Include water treatment or wastewater pretreatment chemicals (acids and bases)

Account for coincidentally manufactured chemicals

Manufacture, Process or Otherwise Use?

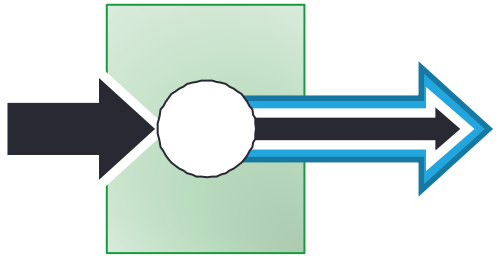
Manufacture



<u>Create</u> a toxic substance:

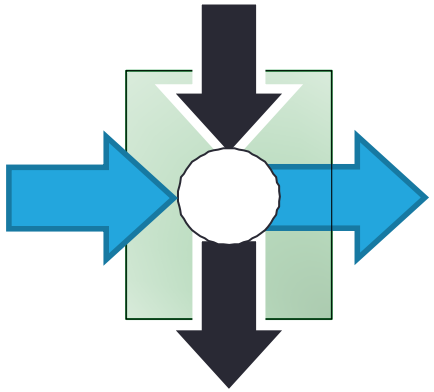
- *Intentionally* – to incorporate into the product (e.g., paint)
- *Unintentionally* – either as part of the product, or as byproduct
- *Import* the substance

Process



<u>Prepare</u> a toxic substance after its manufacture.
Toxic chemical is <u>intentionally incorporated</u> in the product.

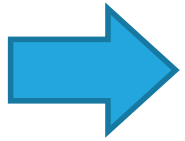
Otherwise Use



<u>Use</u> a toxic substance
in a way that it is **<u>not</u>** intentionally incorporated into the product (e.g., degreasing a machine)

Production Unit

Toxic substance
inputs and outputs

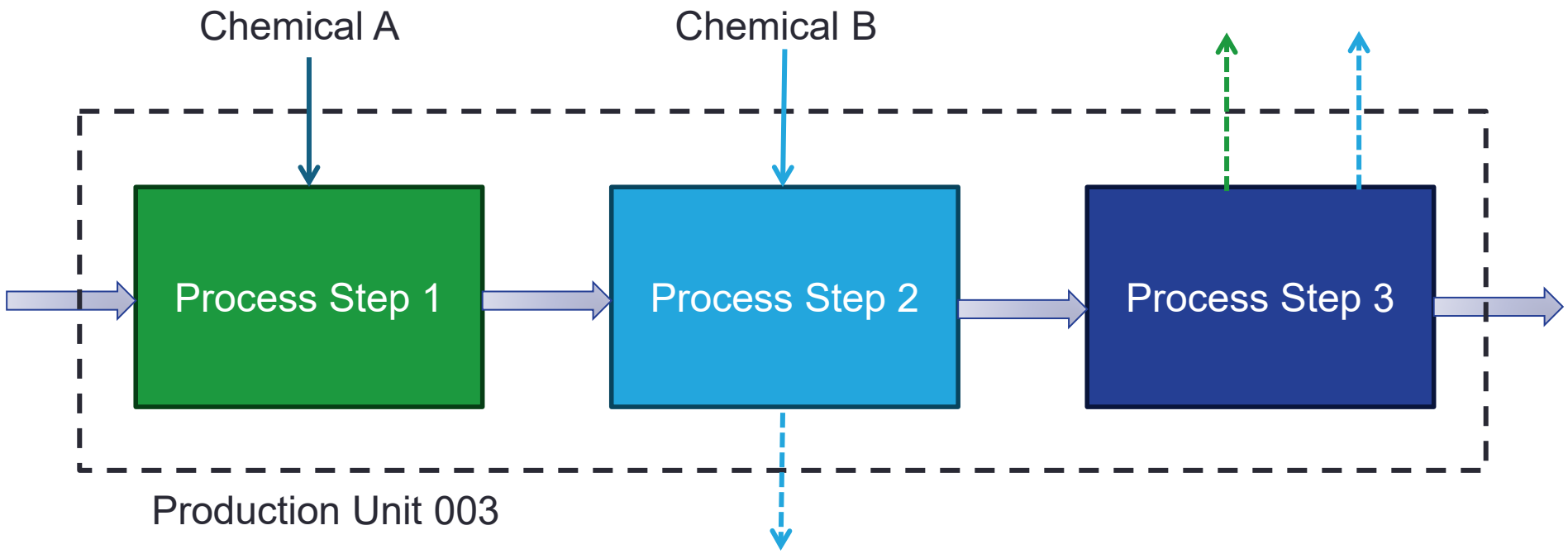


Product
inputs and outputs

Production Unit

"A process, line, method, activity, or technique or a combination or series thereof, used to make a product“

Process or group of processes regarded as a distinct entity for the purpose of TUR planning AND reporting



Sulfuric Acid Use in Production and Waste Treatment

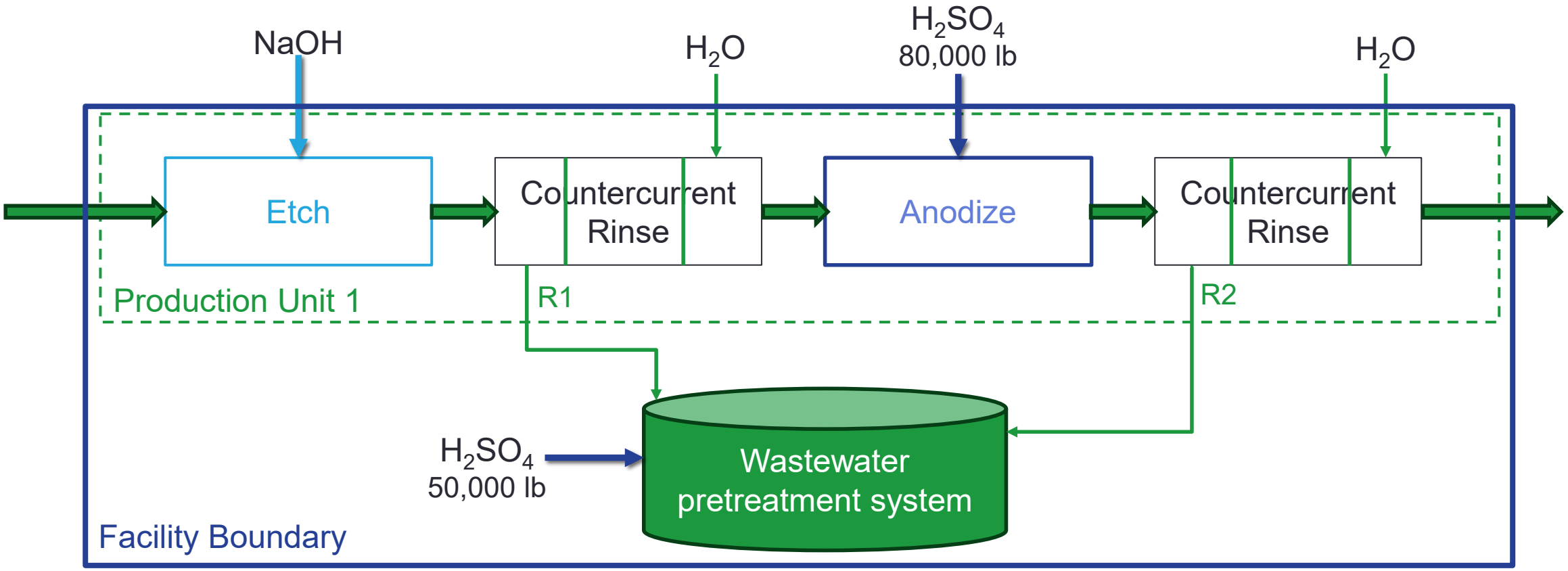
Anodizing Protection Inc. etches aluminum with sodium hydroxide and then anodizes the aluminum part using sulfuric acid. For reporting year 2023 the company reported a **14%** increase in production from the previous year, using **130,000 pounds of sulfuric acid**. **80,000 pounds** was used **in the anodizing production unit**. **50,000 pounds** of the sulfuric acid use was for **pH neutralization** in the wastewater pretreatment system. The company reported **57,000 pounds** of **byproduct** for reporting year 2023. Assume the neutralization process is 100% efficient.

WHAT WAS THE COMPANY'S PRODUCTION RATIO?

- ***IS THE MASS BALANCE COMPLETE?***
  - ***Create PFD and do some math (mass/materials balance)***

Anodize Production Unit

Process Flow & Chemical Pathway Analysis



Remember: Under TURA, byproduct is the amount of chemical that leaves the production unit that is not in product

Given: Byproduct from Production Unit = R1+ R2 = 57,000 lb H_2SO_4

Calculations for completing Form S

Mass Balance
Input = output + amount consumed/transformed

Section 1: Facility-Wide Use

- **1.e** - Otherwise Used= 130,000 lb (given)
- **1.f** - Byproduct = 57,000 lb (given)

Section 2: Materials Balance *(around Production Unit)*

- Input = 80,000 lb (given)
- Output = byproduct = 57,000 lb
- **2.d** - Consumed or Transformed = 80,000 – 57,000 = 23,000 lb

Section 3: Chemicals Used in Waste Treatment Units

- **3.b** – Amount = 50,000 lb (given)

Form S Reporting: Facility-Wide Use of Sulfuric Acid

Section 1 (facility-wide use)

c. Manufactured: 0
d. Processed: 0
e. Otherwise Used: 130,000
f. Generated as Byproduct: 57,000
g. Shipped in or as Product: 0
h. Production or Activity Ratio: 1.14

Section 2 (materials balance)

a. Chemical Recycled Onsite: 0
b. Consumed or Transformed: 23,000
c. Chemical (Product) Held in Inventory: 0
d. Chemical Compound: 0
e. Other: 0
f. "Yes" if anything non-routine occurred at your facility during the reporting year that affected the data reported, if there is not a materials balance, and/or if the Prod. Ratio is <0.5 or >2.

○ Yes ● No

Section 3 (chem used in waste treatment units)

a. Is chemical used to treat waste or control pollution? Yes
b. Enter amount: 50,000

Mass Balance: 1c+d+e = 1f+1g+2a+b+c+d+e + 3b

Commonly Missed in Reports

- Higher Hazard Substances (HHS) - 1,000 lb threshold
- Use of PBTs and PFAS – there is no de minimis level
- Chemical Categories
- Differences in TRI and TURA reporting lists of chemicals & covered facilities
- Wastewater treatment and cleaning chemicals
- New listings for RY 2024 and RY 2025
  - As presented by Lynn Cain
- Coincidently manufactured chemicals, for example:
  - Do you use nitric acid? *(6.4 M lb HNO_3 used in 2023)*
  - Water dissociable nitrate compounds *(0.114 M lb Nitrate compounds reported in 2023)*

Some Differences Between TRI and TURA Reporting

Reporting of Hydrochloric Acid and Sulfuric Acid

- TRI – only aerosol forms
- TURA – both aerosol and non-aerosol forms

(42.3 M lb HCl used in 2023)
(18.25 M lb H_2SO_4 used in 2023)

CERCLA chemicals (not TRI chemicals)

- Sodium Hydroxide & Potassium Hydroxide *(65 M lb NaOH, 9.4 M lb H_3PO_4 used in 2023)*
- Bleach (Sodium Hypochlorite) *(18.25 M lb H_2SO_4 used in 2023)*
- Acetone - TRI delisted in 1993 *(12.1 M lb acetone used in 2023)*
- Benzoic Acid *(0 lb benzoic acid reported in 2023)*
- Ferrous Sulfate – is LHS (no chemical fee) *(5.4 M lb ferrous sulfate used in 2023)*
- Ferric chloride – is LHS (no chemical fee) *(0.2 M lb ferric chloride used in 2023)*
- Paraformaldehyde – is not formaldehyde (has 25,000 lb. threshold) *(0.3 M lb para used in 2023)*

TURA HHS have 1000 lb threshold

- https://www.mass.gov/files/hhs_-_lhs_fact_sheet_final_2016.pdf

Pay attention …

TDI is a Higher Hazard Substance

- Report each CAS# individually

2,4-Toluene diisocyanate	2,6-Toluene diisocyanate	TDI mixed isomers
• 2,4-TDI • CAS 584-84-9	• 2,6-TDI • CAS 91-08-7	• CAS 26471-62-5

Formaldehyde has several synonyms:

- Formalin
- Formol
- Methylene glycol
- Methyl aldehyde
- Methylene oxide

eDEP only gives you one (or maybe two) chemical synonyms, so it's up to you to check against CAS #

Persistent Bio-Accumulative Toxics (PBTs)

U.S. EPA PBTs are automatically designated as HHS by 2007 TURA Amendments. *These chemicals have no de minimis and have lower reporting thresholds*. Here's a partial list of PBTs:

PBT Chemical	Threshold	2023 Use Reported
Dioxin and dioxin-like compounds	0.1 grams	740 lb
Mercury and mercury compounds	10 pounds	7,500 lb Hg; 960 lb Hg cmpds
Benzo (g,h,i) perylene	10 pounds	3,100 lb
Hexachlorobenzene	10 pounds	0 lb
Polychlorinated Biphenyls (PCBs)	10 pounds	2,900 lb
Lead and lead compounds	100 pounds	2.9M lb Pb; 0.4M Pb cmpds
Polycyclic Aromatic Compounds (PACs) category (25 listed chems)	100 pounds	147,000 lb
Tetrabromobisphenol A	100 pounds	1,700 lb
Hexabromocyclododecane (HBCD) category	100 pounds	0 lb

Chemical Categories – Some are HHS or PBTs – Different Thresholds

- Nickel, Silver, Zinc, Copper & Antimony Compounds Categories (25,000 lb. threshold)

(0.6 M lb Ni & Ni cmpds)
(0.28 M lb Ag & Ag cmpds)
(14.9 M lb Cu & Cu cmpds)
(2.4 M lb Sb & Sb cmpds)

- Cadmium, Cyanide & Hexavalent Chromium Compounds Categories (1,000 lb. threshold)
  - Use DEP Category # 1216 for Cr (VI) compounds (total compound weight towards threshold 1,000 lb. threshold)
  - Use DEP Category # 1217 for Non-Cr (VI) compounds (25,000 lb. threshold)

(0.6 M lb Cd & Cd cmpds)
(0.9 M lb CN & CN cmpds)
(14.9 M lb Cr+6 cmpds)

- Lead Compounds (100 lb. threshold)

(0.4 M lb Pb cmpds)

Ammonia Reporting *(230 M lb used in 2023)*

Anhydrous Ammonia (NH_3)

- The total quantity of the anhydrous ammonia manufactured, processed, or otherwise used is reportable.
- When calculating byproduct, the total amount of ammonia is released, transferred, or otherwise managed.

Aqueous Ammonia (NH_4OH)

- Or water dissociable ammonium salts in water
- Use = **10 percent** of the total quantity of the aqueous ammonia manufactured, processed, or otherwise used.
- Byproduct = **10 percent** of the total quantity of aqueous ammonia released, transferred, or otherwise managed.

TUR Reporting Appendices (page 54)

Coincidentally Manufactured Water-Dissociable Nitrate Compounds (10.4 M lb manufactured in 2023)

Nitric acid (HNO_3) neutralization can manufacture water dissociable Nitrate Compounds above reporting thresholds even though <25,000 pounds of HNO_3 treated

$$HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$$

Molecular Weights	63	85

TUR Reporting Appendices (page 35)

Calculating the amount of nitric acid that must be neutralized to generate 25,000 lb nitrate compounds:

$$\frac{MW\ HNO_3}{MW\ NaNO_3} = \frac{lb\ HNO_3}{25{,}000\ NaNO_3}$$

$$\frac{63}{85} = \frac{X}{25{,}000\ lb}$$

X = 18,529 lb *(Form S reportable!)*

Rules for Reporting Individual CERCLA Chemicals and EPCRA Chemical Categories

If a specific chemical is part of an EPCRA Category

- AND

The same chemical is a specifically listed CERCLA chemical

REPORT AS PART OF THE EPCRA CATEGORY

Refer to

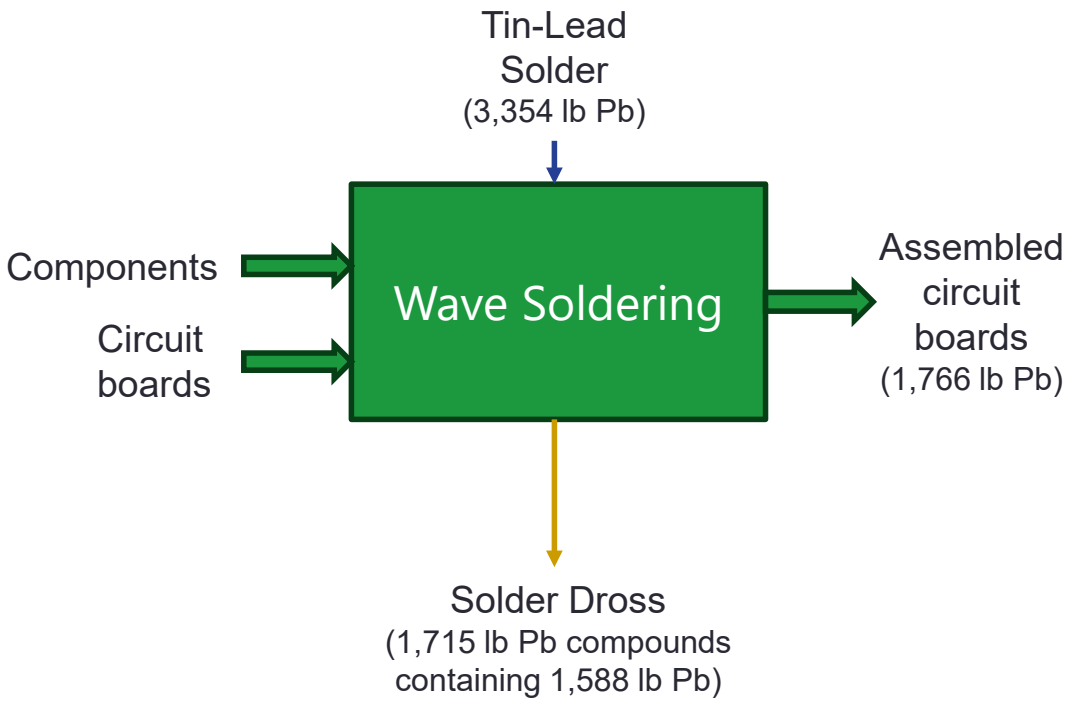
- Excel list of reportable chemicals on DEP's website to determine how to report
- TURA Reporting Appendices - *Rules for Reporting Specifically Listed Chemicals vs. Chemical Categories*

TUR Reporting Appendices (page 84)

Lead & Lead Compounds Reporting

Boards Etc. is a contract circuit board assembler. The company attaches components to customer-supplied circuit boards via wave soldering. In reporting year 2023, the company used tin-lead solder that contained **3,354 pounds of lead**. That same year they sent solder dross (containing **1,715 pounds of reportable lead compounds**) off-site for recycling and received a statement back from its recycler that **1,588 pounds of lead** were recovered from the dross. The amount of **lead that was shipped out with the customer product** was **1,766** pounds. Production of circuit boards increased by **10%** from 2022 to 2023.

- ***WHAT'S THE PRODUCTION RATIO?***
- ***HOW MUCH LEAD AND LEAD COMPOUNDS WERE USED?***
- ***HOW MUCH BYPRODUCT GENERATED?***



Rules for Reporting Elemental Metals & Their Metal Compounds Category

If **lead** is used in excess of 100-pound threshold

- AND

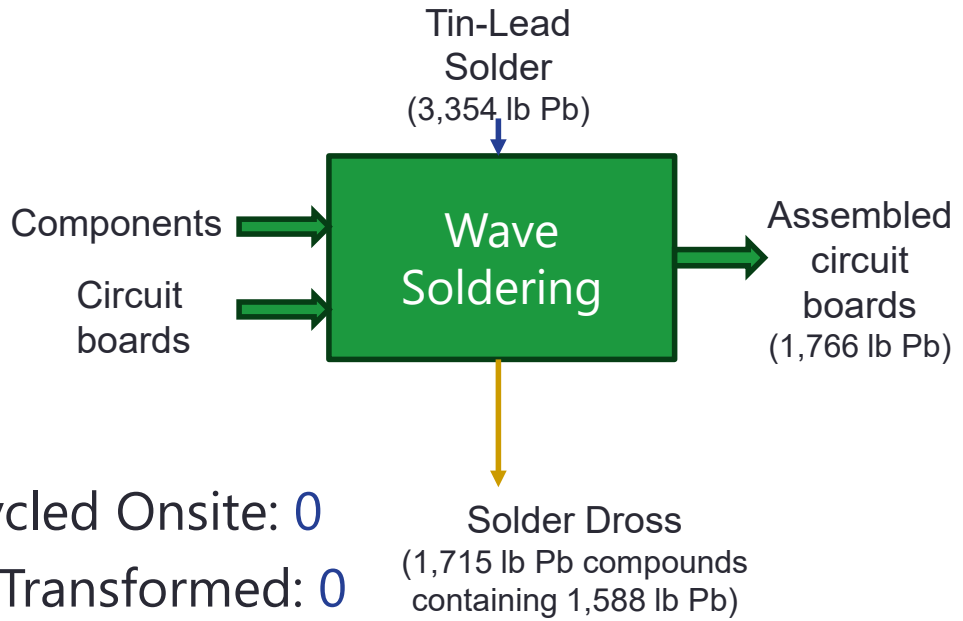
Lead compounds are used in excess of 100-pound threshold

REPORT BOTH THE LEAD AND THE LEAD COMPOUNDS AS LEAD COMPOUNDS ON THE SAME REPORTING FORM

- Pay only 1 fee

Form S Reporting: Facility-Wide Use of Lead & Lead Compounds

Note, use DEP CAS 1026 for lead compounds (1a)



Section 1

c. Manufactured: 1,715
d. Processed: 3,354
e. Otherwise Used: 0
f. Generated as Byproduct: 1,588
g. Shipped in or as Product: 1,766
h. Production or Activity Ratio: 1.1

Mass Balance: 1c+d+e = 1f+1g+2a+b+c+d+e + 3b

Does this balance? Yes

Section 2

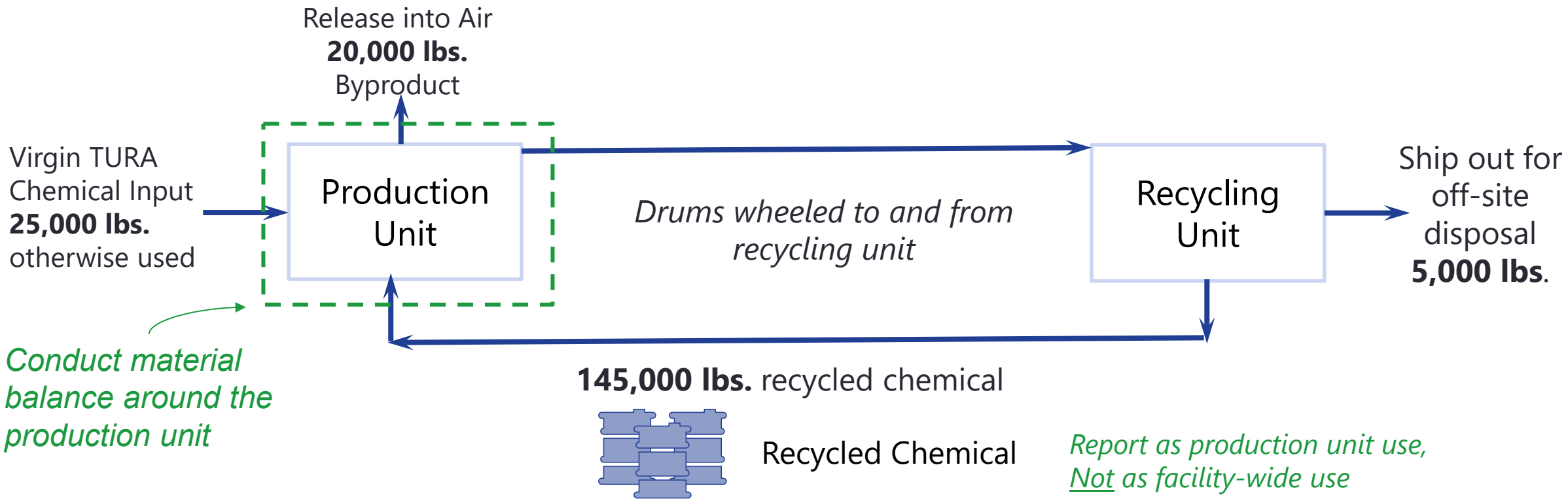
a. Chemical Recycled Onsite: 0
b. Consumed or Transformed: 0
c. Chemical (Product) Held in Inventory: 0
d. Chemical Compound: 1,715
e. Other: 0
f. "Yes" if anything non-routine occurred at your facility during the reporting year that affected the data reported, if there is not a materials balance, and/or if the Prod. Ratio is <0.5 or >2.

○ Yes ● No

Non-Integral Recycling On Site Example

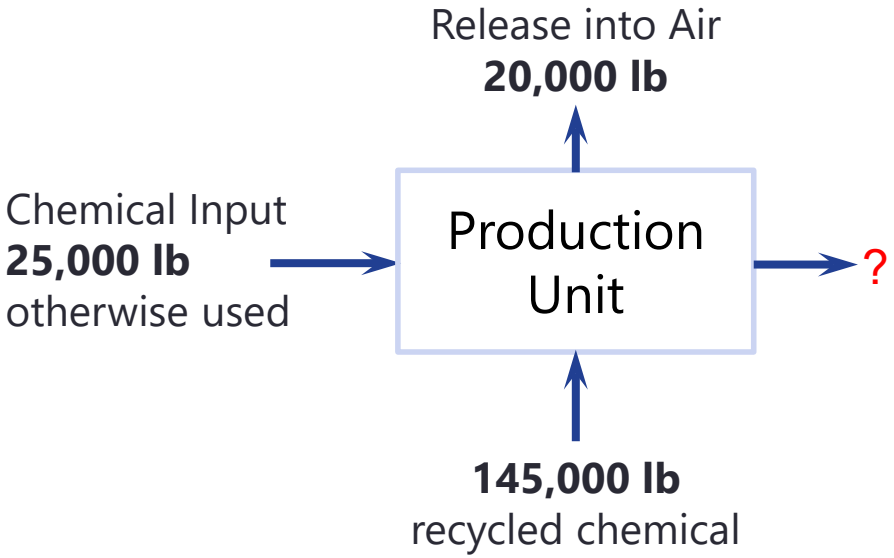
Process Flow and Materials Accounting Balance for Annual TURA Report

(assuming 12 batches of recycling cycle per year)



TUR Reporting Appendices (page 147)

Non-Integral Recycling Example – Form S Section 1



Material Balance: Inputs = Outputs

Production Unit Material Balance:

25,000 + 145,000 = 20,000 + ?

? = 170,000 – 20,000 = 150,000

Remember:

- **Byproduct** is what leaves the **production unit**
- **Emissions** are what leave the **facility**

Byproduct = 20,000 + 150,000 = 170,000 lb

c. Manufactured: 0

d. Processed: 0

e. Otherwise Used: 25,000

f. Generated as Byproduct: 170,000

g. Shipped in or as Product: 0

Do I Trip a Reporting Threshold for Hydrogen Fluoride?

- Do you use hundreds of pounds of HF every year? *(321,600 lb HF reported in 2023)*
- Do you use hundreds of pounds of ammonium bifluoride (ABF) or other fluoride salts every year?
  - When dry ABF contacts water, it generates HF. The hydrogen fluoride derived from fluoride salts (such as ABF) is considered *manufactured*. (EPA guidance 745-R-00-005)
  - When the manufactured HF is used to etch a metal, its *otherwise use* is counted at the production unit level but not reported as otherwise use at the facility-wide level
  - ABF is also a reportable chemical *(112,000 lb ABF reported in 2023)*

To determine whether you trip the **1,000 pound** TURA reporting threshold for HF, review the MassDEP **Guidance on Reporting Hydrofluoric Acid as a Higher Hazard Substance under the Toxics Use Reduction Act**

TUR Reporting Appendices (page 50).

Do You Use Cyanide Compounds?

- Do you use hundreds of pounds of cyanide salts every year?
- Do you plate hundreds of metal each year using a cyanide plating bath?
  - *93,200 lb cyanide compounds used in 2023*

To determine whether you trip the **1,000 pound** TURA reporting threshold for Cyanide Compounds (TURA chemical category # 1016), review the MassDEP **Guidance on Quantifying Use and Reporting Cyanide Compounds**

TUR Reporting Appendices (page 47).

TURA & TRI Reporting Resources

- TURA Reporting –
  - Toxics Use Reduction Reporting Instructions
  - Toxics Use Reduction Reporting Instructions Appendices
  - Complete List of TURA Chemicals
  - eDEP/TURA Online Filing Line by Line TIPS

- TRI Reporting -
  - TRI Homepage
  - Reporting for TRI Facilities - includes TRI chemical list, list of covered Sectors, TRI reporting software (TRI-MEweb), and number of guidance materials.

Contact Us

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- Look for the upcoming webinar on math skills for planning and reporting, 6/17/25 Noon-1:30PM Register here

turi.org