KANSAS STATE UNIVERSITY

Documenting Hazardous Waste Determinations

2024 Kansas Department of Labor Conference

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Pollution Prevention Institute
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Pollution Prevention Institute

"**The first and most important step in [RCRA]** is for generators of solid waste to determine whether their waste is also a hazardous waste"

EPA in its HW Generator Improvement Rule preamble, page 17:
govinfo.gov/content/pkg/FR-2016-11-28/pdf/2016-27429.pdf

Pollution Prevention Institute

About PPI

K-State College of Engineering

- Dept. of Engineering Extension
  - **Pollution Prevention Institute (PPI)**
    - Operating since 1989
    - Programs are 100% grant funded
      - Assist with TAB and TCTAC
      - Pollution Prevention
    - Operate the state's **Small Business Environmental Assistance Program (SBEAP)**
      - Free, confidential assistance to small businesses
        - Multimedia – hazardous waste, stormwater, air permitting, etc.
        - Hotline services (phone & email)
        - On-site visits

Mission

The Pollution Prevention Institute's mission is to promote sustainability through environmental education and services to industry, institutions, and communities.

The Small Business Environmental Assistance Program's mission is to help Kansas small businesses comply with environmental regulations and identify pollution prevention opportunities.

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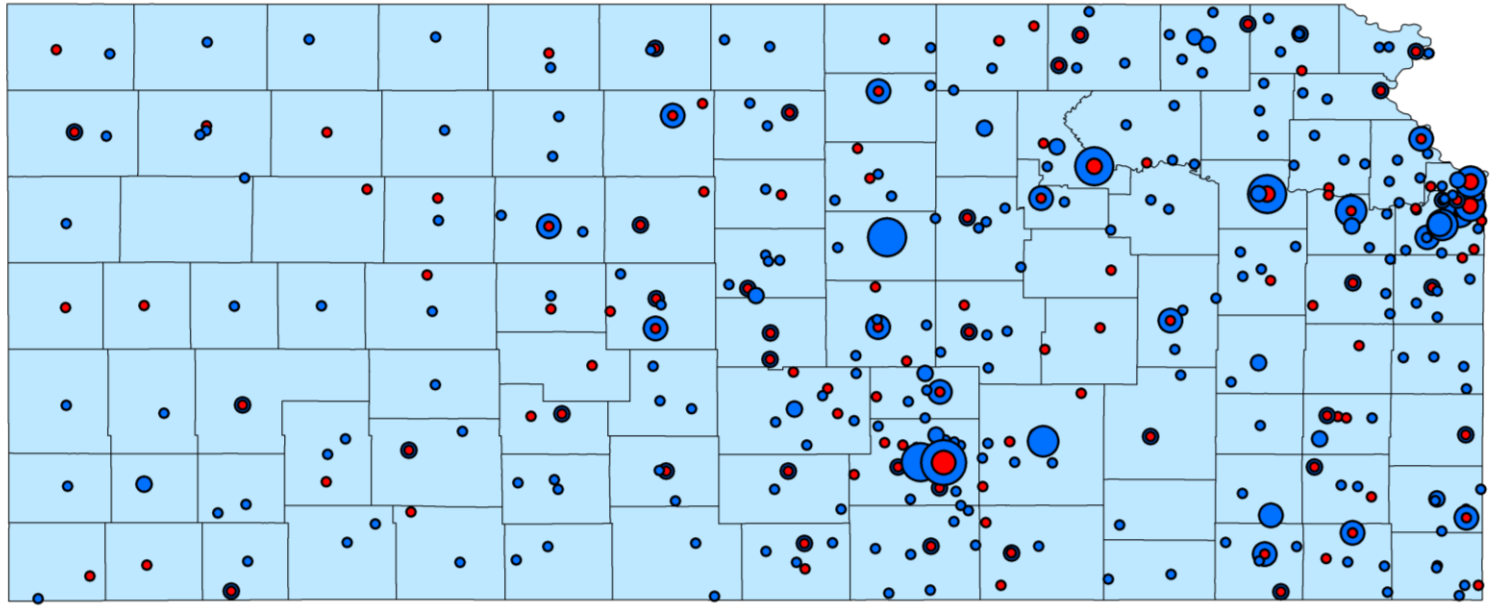
KSU Pollution Prevention Institute (PPI): Technical Assistance Offered in Kansas, 2000-2023



About this map:

Founded in 1989, the Pollution Prevention Institute or PPI, is a Kansas State University College of Engineering organization dedicated to serving Kansas industries and institutions with environmental compliance and pollution prevention technical assistance. Entirely grant-funded, PPI provides a number of services, including an environmental hotline, on-site assessments, technical trainings, sustainability interns and web resources. Grantors include: U.S EPA, KDHE, and USDA.

PPI Technical Assistance Instances

Hotline Calls		Site Visits
	1 - 19	
	20 - 62	
	63 - 154	
	155 - 287	
	288 - 732	
	733 - 1419	

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Purpose

One hour refresher on **hazardous waste determinations**

1. Regulatory background
2. Determinations:
    1. The **what**
    2. The **who**
    3. The **why**
    4. The **how**
3. Common pitfalls
4. Example scenarios

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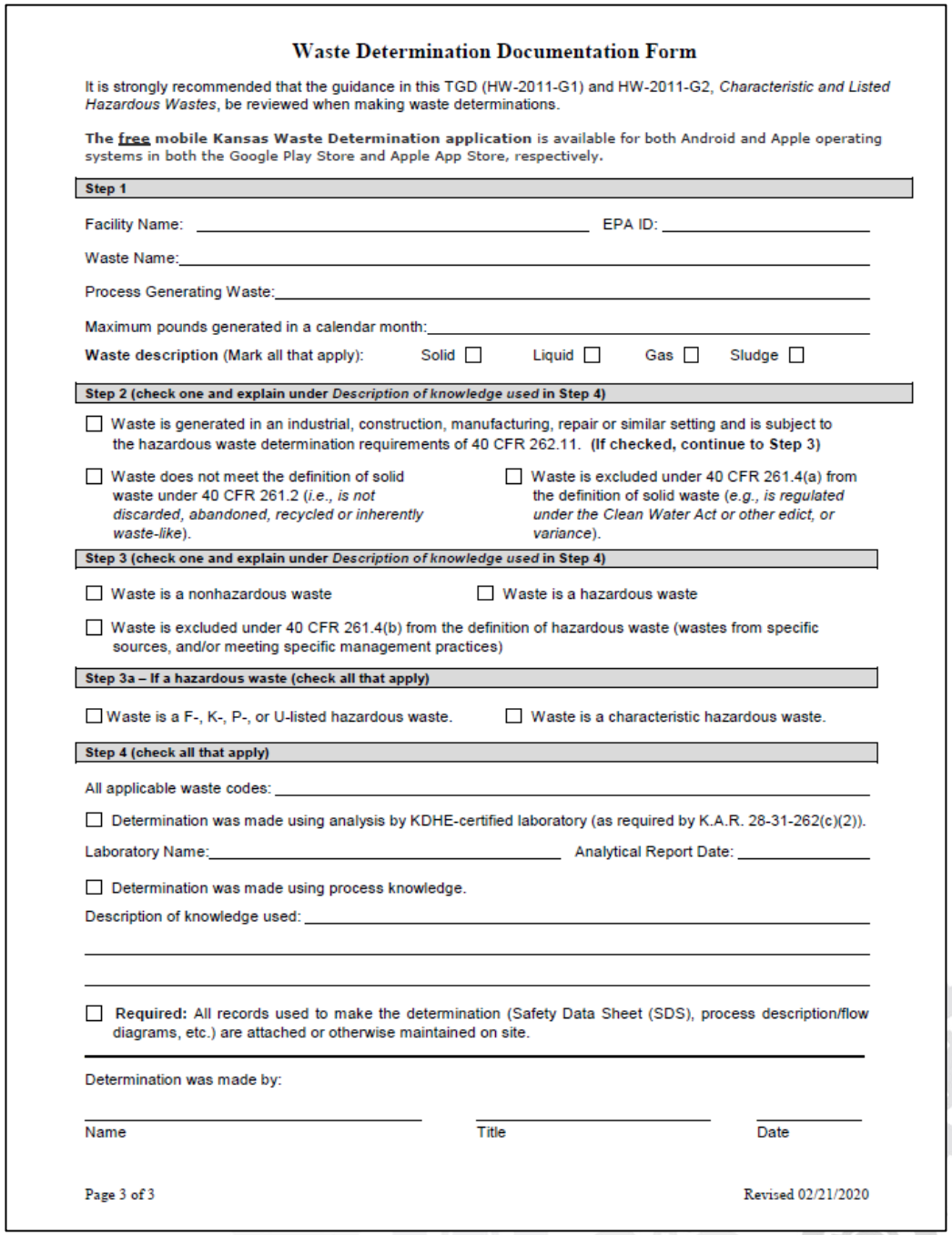

Waste Determination Documentation Form

It is strongly recommended that the guidance in this TGD (HW-2011-G1) and HW-2011-G2, *Characteristic and Listed Hazardous Wastes*, be reviewed when making waste determinations.

The free mobile Kansas Waste Determination application is available for both Android and Apple operating systems in both the Google Play Store and Apple App Store, respectively.

Step 1

Facility Name: _____ EPA ID: _____

Waste Name: _____

Process Generating Waste: _____

Maximum pounds generated in a calendar month: _____

Waste description (Mark all that apply): Solid ☐ Liquid ☐ Gas ☐ Sludge ☐

Step 2 (check one and explain under *Description of knowledge used* in Step 4)

☐ Waste is generated in an industrial, construction, manufacturing, repair or similar setting and is subject to the hazardous waste determination requirements of 40 CFR 262.11. **(If checked, continue to Step 3)**

☐ Waste does not meet the definition of solid waste under 40 CFR 261.2 (*i.e., is not discarded, abandoned, recycled or inherently waste-like*).

☐ Waste is excluded under 40 CFR 261.4(a) from the definition of solid waste (*e.g., is regulated under the Clean Water Act or other edict, or variance*).

Step 3 (check one and explain under *Description of knowledge used* in Step 4)

☐ Waste is a nonhazardous waste ☐ Waste is a hazardous waste

☐ Waste is excluded under 40 CFR 261.4(b) from the definition of hazardous waste (wastes from specific sources, and/or meeting specific management practices)

Step 3a – If a hazardous waste (check all that apply)

☐ Waste is a F-, K-, P-, or U-listed hazardous waste. ☐ Waste is a characteristic hazardous waste.

Step 4 (check all that apply)

All applicable waste codes: _____

☐ Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Name: _____ Analytical Report Date: _____

☐ Determination was made using process knowledge.

Description of knowledge used: _____

☐ **Required:** All records used to make the determination (Safety Data Sheet (SDS), process description/flow diagrams, etc.) are attached or otherwise maintained on site.

Determination was made by:

Name _____ Title _____ Date _____

Page 3 of 3 Revised 02/21/2020

Regulatory background (Fed)

- Resource Conservation and Recovery Act of 1976 (**RCRA**)
  - Regulated by EPA under 40 CFR Subtitles A-J (40 CFR parts 239-282)
    - Parts 239-259 focus on solid waste management
    - Parts 260-273 focus on hazardous waste management
- Goals of RCRA:
  - Protect human health
  - Reduce waste and conserve natural resources
  - Reduce or eliminate hazardous waste
- Cradle to grave responsibility
- Provides framework to classify and manage waste

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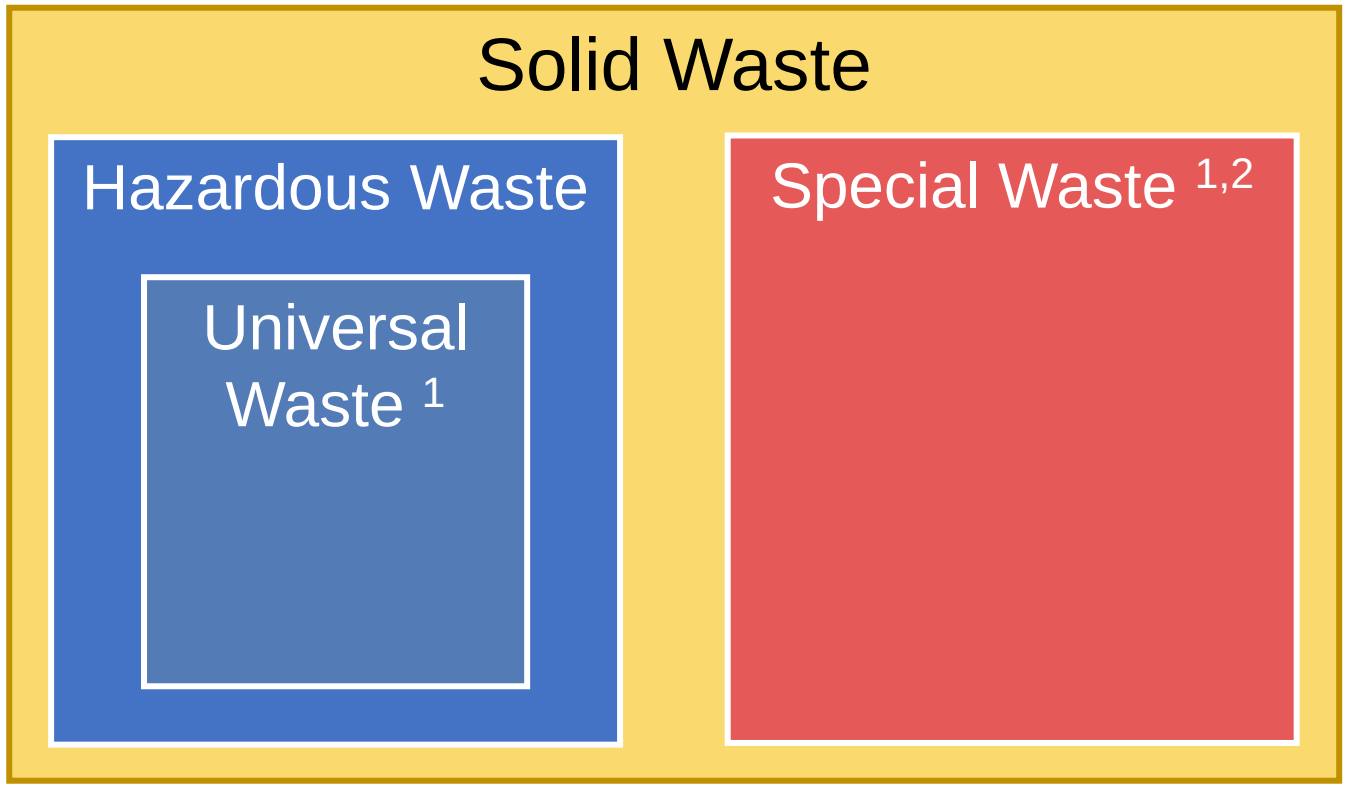
Regulatory background (State)

- EPA gave Kansas primacy to regulate / enforce RCRA in 1981
  - Overseen by Kansas Department of Health and Environment (KDHE)
    - Overseen within KDHE by Bureau of Waste Management (BWM) (kdhe.ks.gov/168/Waste)
  - EPA can, and does, still inspect regulated facilities in Kansas
- Kansas RCRA regulations are:
  - Stricter than EPA's and most states'
  - Based on the July 1, 2006 version of federal RCRA
    - KDHE BWM is currently updating to the July 1, 2023 version of federal RCRA
    - KDHE BWM has already made some updates through policy (kdhe.ks.gov/656/Policies)

Cradle to grave

https://www.epa.gov/hw/learn-basics-hazardous-waste

Waste classification framework



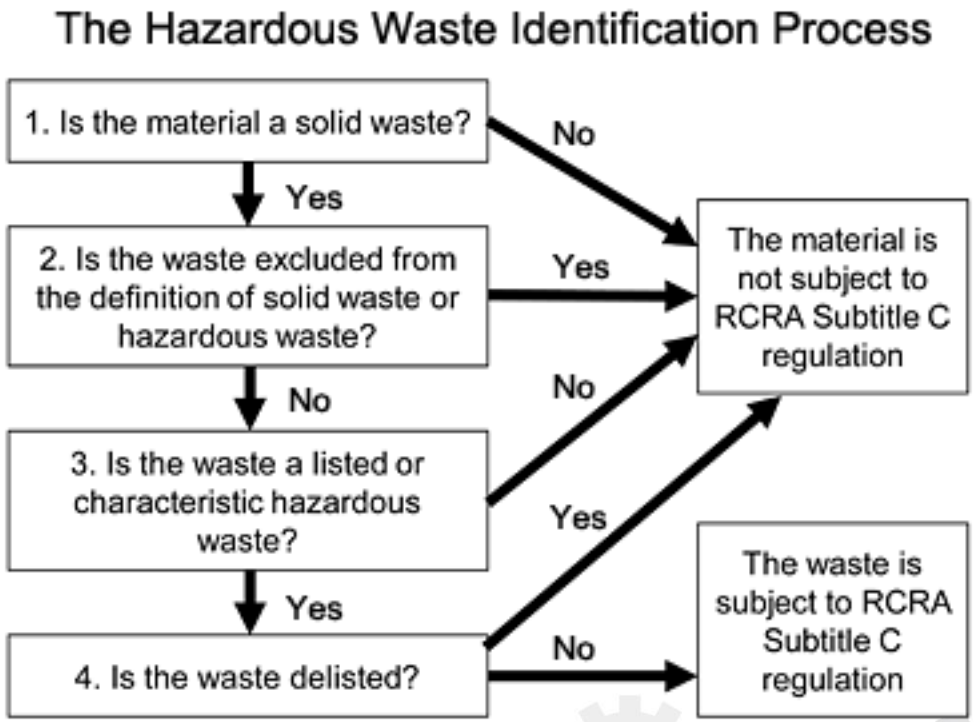
[1] Out of scope of presentation (ask if questions)
[2] Kansas's definition of "special waste" differs from federal definition

Other categories also exist, including:

- Municipal solid waste (MSW)
- Household hazardous waste (HHW)
- Construction and demolition waste (C&D)
- Medical waste
- Mixed waste
- And many others . . .

What are waste determinations?

- A waste determination is a four-step process resulting in a waste determination form
- This process is how you identify a waste as either:
  - A hazardous waste, or
  - *Not* a hazardous waste
- This is how you know if you're a generator or not
  - "Generator means any person . . . whose act or process produces hazardous waste . . ." (40 CFR 260.10)



https://www.epa.gov/hw/learn-basics-hazardous-waste#hwid

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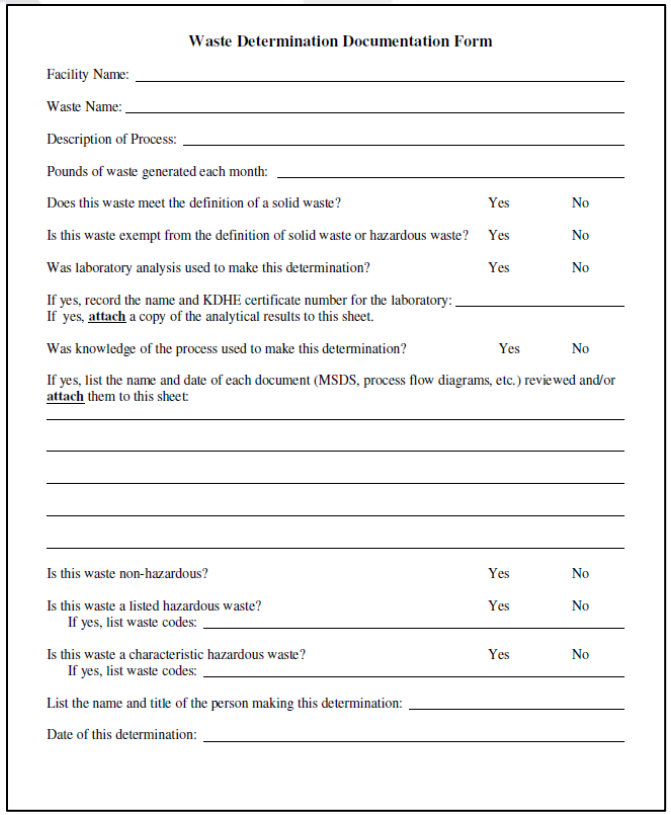
Waste determination requirements

- The waste determination process **MUST** be:
  - Conducted for all waste streams*
  - Conducted at the waste's point of generation
    - Prior to dilution, mixing, alteration, or any point thereafter where the waste's properties may change
  - Repeated if a waste's properties change such that they could alter the waste determination results, such as from:
    - Changes to the processes generating the waste (new inputs, parameters, etc.)
    - Changes to the waste itself (phase separations, chemical reactions, etc.)
  - Documented on a waste determination form
    - Documentation must be retained for a minimum of three years since last applicable
      - In Kansas, this is required for both hazardous and nonhazardous waste determinations

* KDHE BWM's TGD HW-2011-G1: "Generally, the only waste stream not required to have a documented waste determination is office trash"

Waste determination forms



Waste Determination Documentation Form

Facility Name: _____

Waste Name: _____

Description of Process: _____

Pounds of waste generated each month: _____

Does this waste meet the definition of a solid waste? Yes No

Is this waste exempt from the definition of solid waste or hazardous waste? Yes No

Was laboratory analysis used to make this determination? Yes No

If yes, record the name and KDHE certificate number for the laboratory: _____
If yes, **attach** a copy of the analytical results to this sheet.

Was knowledge of the process used to make this determination? Yes No

If yes, list the name and date of each document (MSDS, process flow diagrams, etc.) reviewed and/or **attach** them to this sheet:

_____

_____

_____

_____

_____

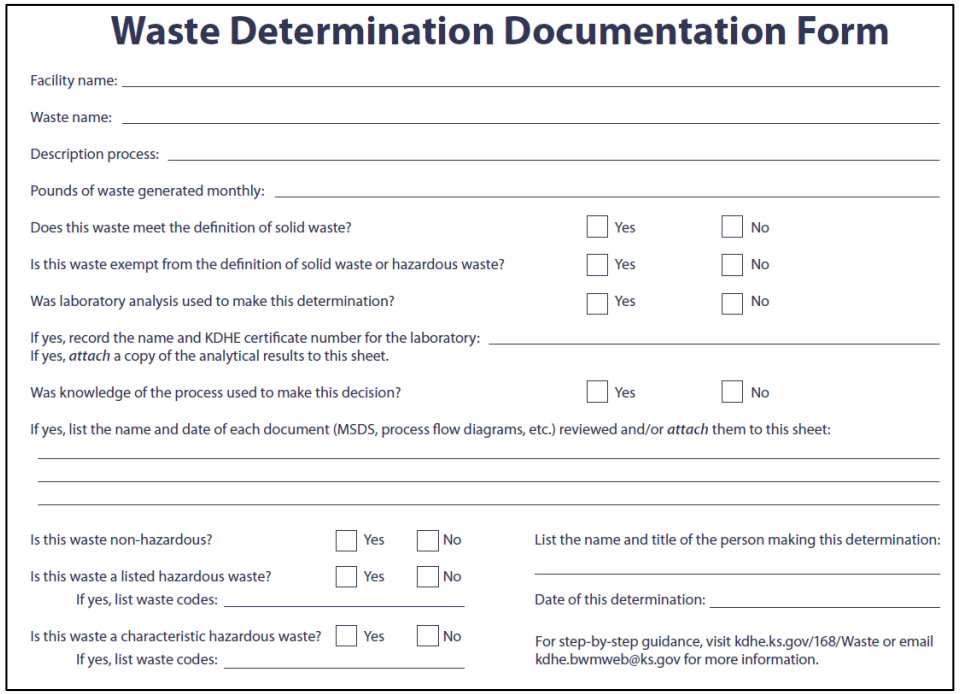
Is this waste non-hazardous? Yes No

Is this waste a listed hazardous waste? Yes No
If yes, list waste codes: _____

Is this waste a characteristic hazardous waste? Yes No
If yes, list waste codes: _____

List the name and title of the person making this determination: _____

Date of this determination: _____



Waste Determination Documentation Form

Facility name: _____

Waste name: _____

Description process: _____

Pounds of waste generated monthly: _____

Does this waste meet the definition of solid waste? ☐ Yes ☐ No

Is this waste exempt from the definition of solid waste or hazardous waste? ☐ Yes ☐ No

Was laboratory analysis used to make this determination? ☐ Yes ☐ No

If yes, record the name and KDHE certificate number for the laboratory: _____
If yes, *attach* a copy of the analytical results to this sheet.

Was knowledge of the process used to make this decision? ☐ Yes ☐ No

If yes, list the name and date of each document (MSDS, process flow diagrams, etc.) reviewed and/or *attach* them to this sheet:

_____

_____

_____

Is this waste non-hazardous? ☐ Yes ☐ No

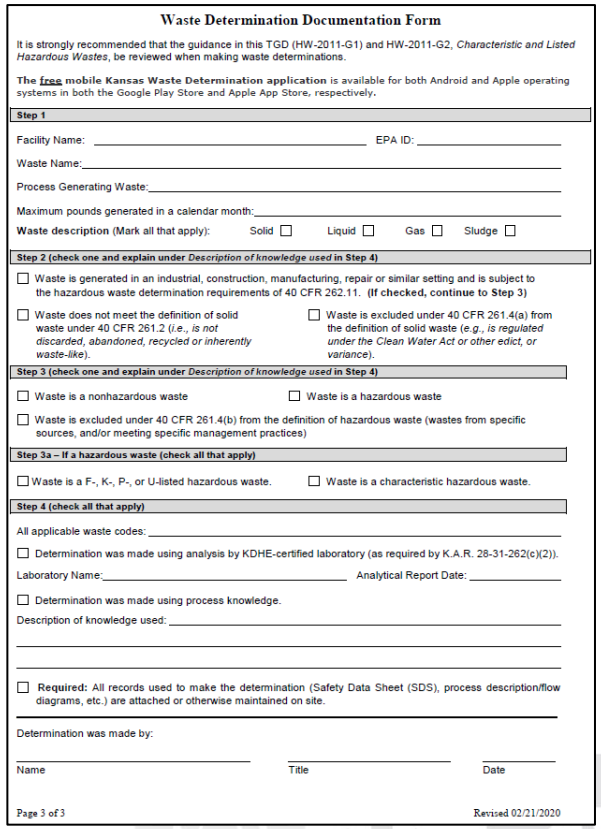
Is this waste a listed hazardous waste? ☐ Yes ☐ No
If yes, list waste codes: _____

Is this waste a characteristic hazardous waste? ☐ Yes ☐ No
If yes, list waste codes: _____

List the name and title of the person making this determination: _____

Date of this determination: _____

For step-by-step guidance, visit kdhe.ks.gov/168/Waste or email kdhe.bwmweb@ks.gov for more information.



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Step 3a – If a hazardous waste (check all that apply)

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Step 4 (check all that apply)

All applicable waste codes: _____

☐ Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Name: _____ Analytical Report Date: _____

☐ Determination was made using process knowledge.

Description of knowledge used: _____

_____

_____

☐ **Required:** All records used to make the determination (Safety Data Sheet (SDS), process description/flow diagrams, etc.) are attached or otherwise maintained on site.

Determination was made by:

_____ _____ _____
Name Title Date

Page 3 of 3 Revised 02/21/2020

Left to right:
- Last page of SBEAP 2024 HW Compliance Calendar
- KDHE BWM Hazardous Waste Generator Handbook, page 8
- KDHE BWM TGD HW-2011-G1, page 3

Who does this apply to?

- **Each generator is required to conduct waste determinations on their solid wastes**
  - Generators are subject to the management standards of 40 CFR 262.10
    - 262.10 requires generators to comply with 40 CFR 262.11
      - 262.11 governs hazardous waste determinations, stating:
        - "A person who generates a solid waste . . . must determine if that waste is a hazardous waste . . ." (July 1, 2006 version)
        - "A person who generates a solid waste . . . must make an accurate determination as to whether that waste is a hazardous waste . . ." (August 8, 2024 version)
- Reiterated by EPA in the HW Generator Improvement Rule:
  - "Generators are, and always have been, ultimately responsible for making accurate hazardous waste determinations." (Nov. 28, 2016; 81 FR 85750)

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Why are they important?

- **<u>Determinations dictate management</u>**
  - Improper determination → improper management → elevated risk
  - Proper determination → proper management → minimized risk
- Remember: RCRA's "cradle to grave" responsibility
  - A generator's legal liability for their hazardous waste is permanent, even for hazardous waste they unknowingly generate
    - **Ignorance is no excuse to the law**
    - **Know what you generate, reduce risk**

Why are they important?

- Failure to make a correct hazardous waste determination may lead to cascading penalties
  - Example RCRA violations:
    - Failure to obtain an EPA ID number
    - Improper container management practices
    - Lack of record keeping
    - Lack of proper training
    - Use of an unregistered waste transporter
    - On-site treatment of waste w/o a permit
    - Illegal waste disposal
    - Etc. . .
  - Possible worker health and safety violations

"A generator's failure to properly analyze . . . waste does not exempt the waste from regulation."
EPA in RO 11424

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Enforcement and penalties

Kansas Department of Health and Environment
Bureau of Waste Management Policy 2011-P4
related to
Solid and Hazardous Waste Enforcement
effective April 29, 2011

https://www.kdhe.ks.gov/1885/Hazardous-Waste-Compliance-Enforcement

HAZARDOUS WASTE PENALTY MATRIX
Kansas Department of Health and Environment
Bureau of Waste Management

Prepared by the
Compliance Assistance & Enforcement Section
Compliance & Enforcement Unit

Revised December 9, 2011

https://www.kdhe.ks.gov/572/Solid-Hazardous-Waste-Compliance-Documen

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Northern Star (Pogo) LLC penalized $600,000 for hazardous waste management violations

April 11, 2023

Contact Information
EPA Region 10 Press Office (R10_Press_Team@epa.gov)

The U.S. Environmental Protection Agency announced today that Northern Star (Pogo) L.L.C. was fined $600,000 for improper storage, treatment, and disposal of hazardous materials at its gold mine and laboratory in Delta Junction, Alaska.

"Strict accountability for hazardous waste is vital to protecting people and the environment at every step of the way," said **EPA Region 10 Office of Enforcement and Compliance Assurance Acting Director Stacy Murphy**. "Companies are required to take responsibility for these materials for their entire lifespan and must be held accountable for failing to do so."

Following an inspection in 2019, EPA cited Northern Star (Pogo) L.L.C. for 81 violations of the Resource Conservation and Recovery Act, including:

- Failure to determine if waste from laboratory testing was hazardous waste.
- Treatment, storage, and disposal of hazardous waste without a permit.
- Storage in two unlabeled 762-gallon belowground tanks, which accumulated hazardous wastes from laboratory tests. The tanks did not meet design and installation requirements, and lacked both secondary containment and a leak detection system.
- Disposal of about 364,450 tons of waste in the gold mine without proper treatment.

RCRA is designed to protect public health and the environment and avoid long and extensive cleanups by requiring the safe, environmentally sound storage and disposal of hazardous waste.

Press release: https://www.epa.gov/newsreleases/northern-star-pogo-llc-penalized-600000-hazardous-waste-management-violations
Settlement details:
https://yosemite.epa.gov/OA/RHC/EPAAdmin.nsf/Filings/40D1BA602C269F2A852588CB00627270/$File/CAFO_Northern-Star-Pogo-LLC_Cert%20of%20Service.pdf

Recap so far

- Regulatory background:
  - RCRA provides a framework to classify and manage waste
    - Solid waste, hazardous waste
  - RCRA uses a cradle to grave principle for liability
    - Generators are permanently liable for their hazardous waste
    - Ignorance is no excuse to the law
  - KDHE BWM regulates / enforces RCRA in Kansas
- Determinations:
  - The **what** – determinations are used to classify waste as hazardous or not
    - Done for all waste streams at the point of generation
    - Repeat if waste properties change
    - Keep documentation for at least 3 years since last applicable
  - The **who** – all generators of hazardous waste must make determinations
  - The **why** – determinations dictate management
    - Incorrect determination → incorrect management → elevated legal and safety risks
    - Correct determination → correct management → minimized legal and safety risks

How do you conduct a waste determination?

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Kansas Department of Health and Environment
Bureau of Waste Management
1000 SW Jackson, Suite 320, Topeka, Kansas 66612-1366

Hazardous Waste Determinations and Documentation

Technical Guidance Document HW-2011-G1

This technical guidance document (TGD) explains the steps involved in making a waste determination and the associated documentation requirements for businesses, government agencies, institutions, and other entities that generate waste in Kansas as required by federal regulations adopted by reference in KAR 28-31-261.

Introduction

Hazardous waste determinations can be complicated and must be done for every waste stream generated at a facility. This guidance is not designed for every waste stream and should not be used without consulting the regulations. Generally, the only waste stream that is not required to have a documented waste determination is office trash. Breaking the waste determination into steps can make it easier to complete the process.

Making Waste Determinations

Step 1

Make a list of all waste streams being generated at the facility. List what process generates each waste stream and document how many pounds of each waste stream are generated each month (don't average over months).

Step 2

Check to see if each waste meets the definition of "solid waste" as found in the Code of Federal Regulations, 40 CFR 261.2. Waste is considered solid waste if it:

- Is a solid or a liquid (or in some cases a gas) that is discarded, abandoned, recycled, or considered inherently waste-like; and
- Is not otherwise exempt from the definition of solid waste under 40 CFR 261.4(a).

One common way that materials become exempt from the definition of solid waste is when they are discharged to a sewer or drain that is regulated under the Clean Water Act, for example an NPDES discharge point, a pre-treatment system, or a publicly owned treatment works.

Step 3

For each waste that meets the definition of "solid waste", check to see if the waste meets the definition of "hazardous waste" as found in 40 CFR 261.3. Use knowledge of how the waste was generated (process knowledge) and/or have the waste analyzed at a Kansas Department of Health and Environment (KDHE) certified laboratory using EPA-approved test methods. Some wastes may need to be evaluated using both process knowledge and analysis, while others can be evaluated using one or the other alone.

Hazardous waste is divided into two broad categories: listed waste and characteristic waste. A hazardous waste can be both listed and characteristic. For more details on listed and characteristic hazardous wastes and determining waste codes, please refer to TGD HW-2011-G2, Characteristic and Listed Hazardous Wastes.

Step 4

Prepare a document stating whether or not the waste is hazardous. If it is hazardous, list the applicable waste codes (D001, F003, U183, etc.). This is the very important final step in the hazardous waste determination process.

Documenting Waste Determinations

Maintain documentation of Steps 1 through 4. This documentation must be kept for 3 years from the last date the waste was shipped off-site.

Adequate documentation will include a statement about whether or not the waste is hazardous as well as copies of all documents used in Steps 1 through 3. Documentation is required for all wastes, both non-hazardous and hazardous. Some examples of documentation that may be included with the waste determination statement are:

- Safety Data Sheets (SDSs);
- Process flow diagrams;
- Analytical test results from a KDHE-certified laboratory; and
- Chemical reaction diagrams.

None of these documents is acceptable as an adequate waste determination by itself, as none of them will state conclusively whether the waste is hazardous or non-hazardous.

Another document that is inadequate by itself is a Waste Profile from a contractor. These forms are often filled out by hazardous waste contractors through interviews with generators and frequently are not supported by any real investigation into the process generating the waste. In addition, they may be based on analytical tests done in laboratories that are not certified by KDHE. Always ask the contractor to use a KDHE-certified laboratory for all analytical testing to ensure that repeat waste determination analysis is not required. Also, if a Waste Profile is used as part of the hazardous waste determination, all supporting documentation, including those documents previously listed, must be attached.

Adequately documenting waste determinations can be difficult. To assist with this process, KDHE has created the attached example document that may be used. This specific form is not required and may be modified to meet the specific needs of individual facilities.

Summary

Conducting an adequate determination for each waste stream and properly documenting that determination will help facilities stay in compliance and avoid costly mistakes. Adequate determinations are the foundation of any good hazardous waste management program and will help reduce management and disposal costs.

Certified Laboratories

A list of KDHE-certified laboratories can be found at: www.kdheks.gov/envlab/disclaimer.html

For additional information regarding proper management of solid or hazardous waste in Kansas, you may contact the Bureau of Waste Management at (785) 296-1600 or the address at the beginning of this document, or visit the Bureau's website at www.kdheks.gov/waste/.

https://www.kdhe.ks.gov/1889/Hazardous-Waste-ID-Management

How do you conduct a waste determination?

1. List all waste streams
   - Don’t forget wastes from “hidden” processes, such as maintenance and calibration activities
2. Identify which streams are solid wastes
   - Remember, RCRA “solid wastes” could be liquid or gaseous, not just solid
   - Review your solid waste streams for potential exclusions
3. Identify which streams are hazardous wastes (and why)
   - Review your hazardous waste streams for potential exclusions
4. Document all solid and hazardous waste stream determinations
   - Maintain for at least 3 years since last applicable

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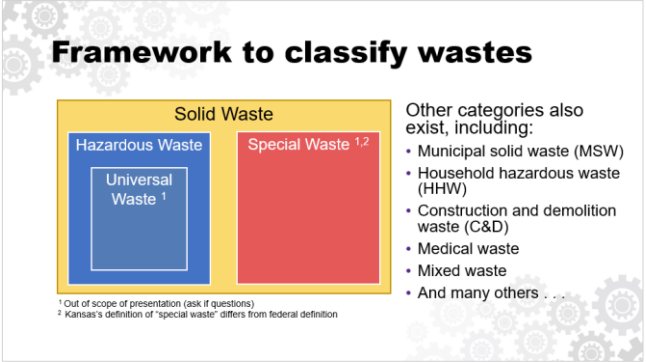

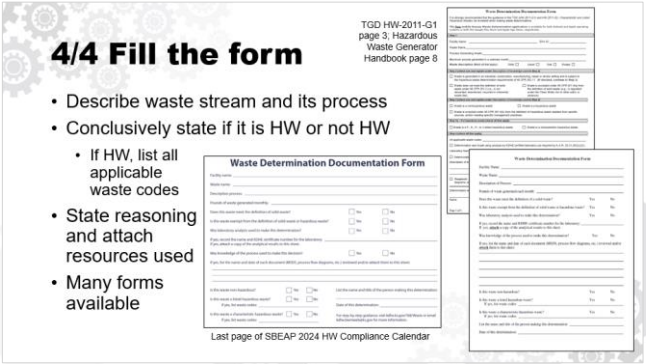

1/4 Mapping your waste streams

- Can be textual or visual, example methods:
  - Box flow diagram
  - Value stream map
  - SIPOC
  - Turtle diagram
  - Whatever makes sense and works for you ☺
- Include typical waste generation per month

- Visualizing streams can be helpful in other areas, too!
  - ID your bottlenecks
    - Equipment flow
    - Material flow
    - Personnel flow
  - Help contextualize your operations
  - Use as a training tool

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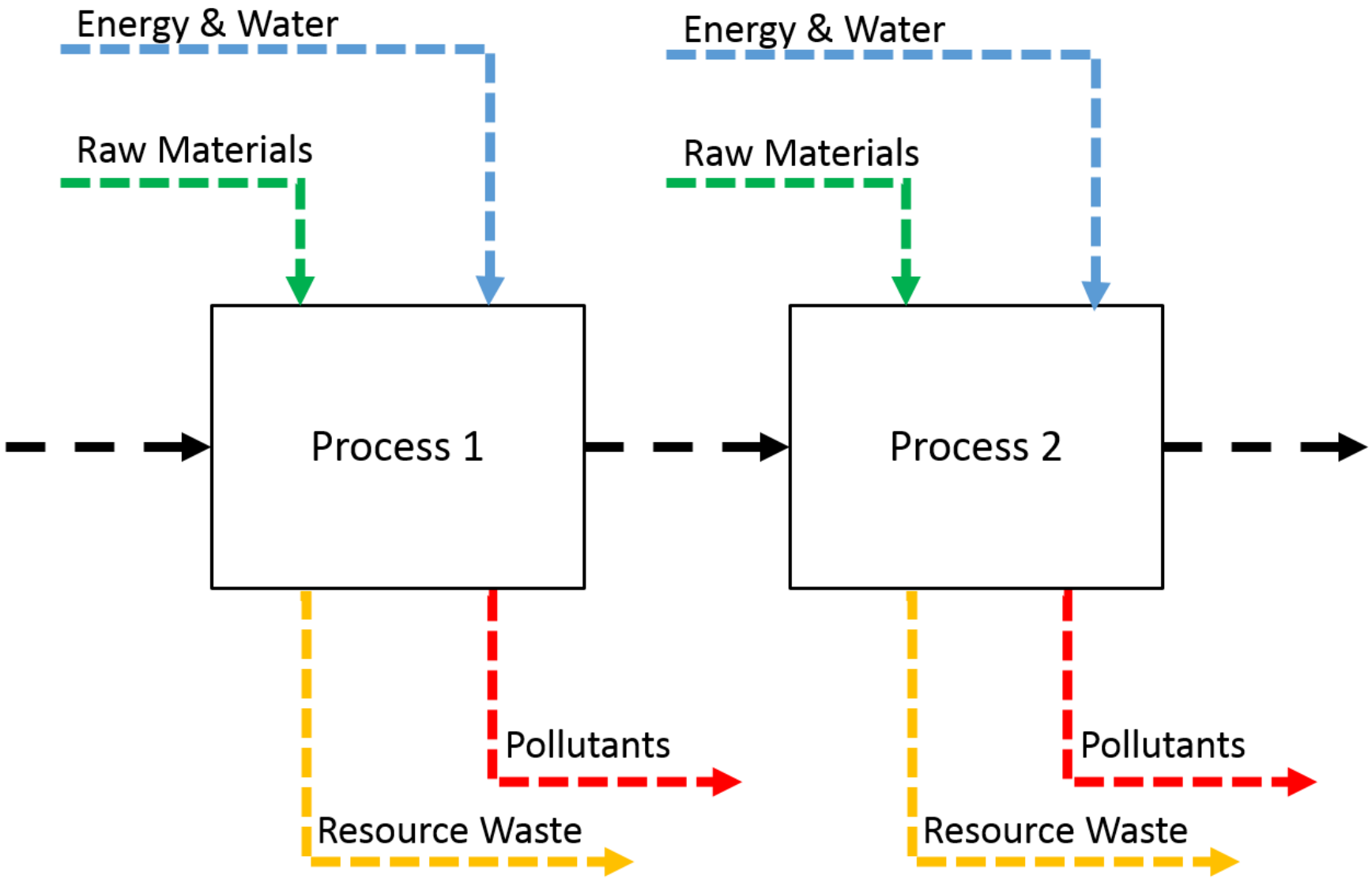
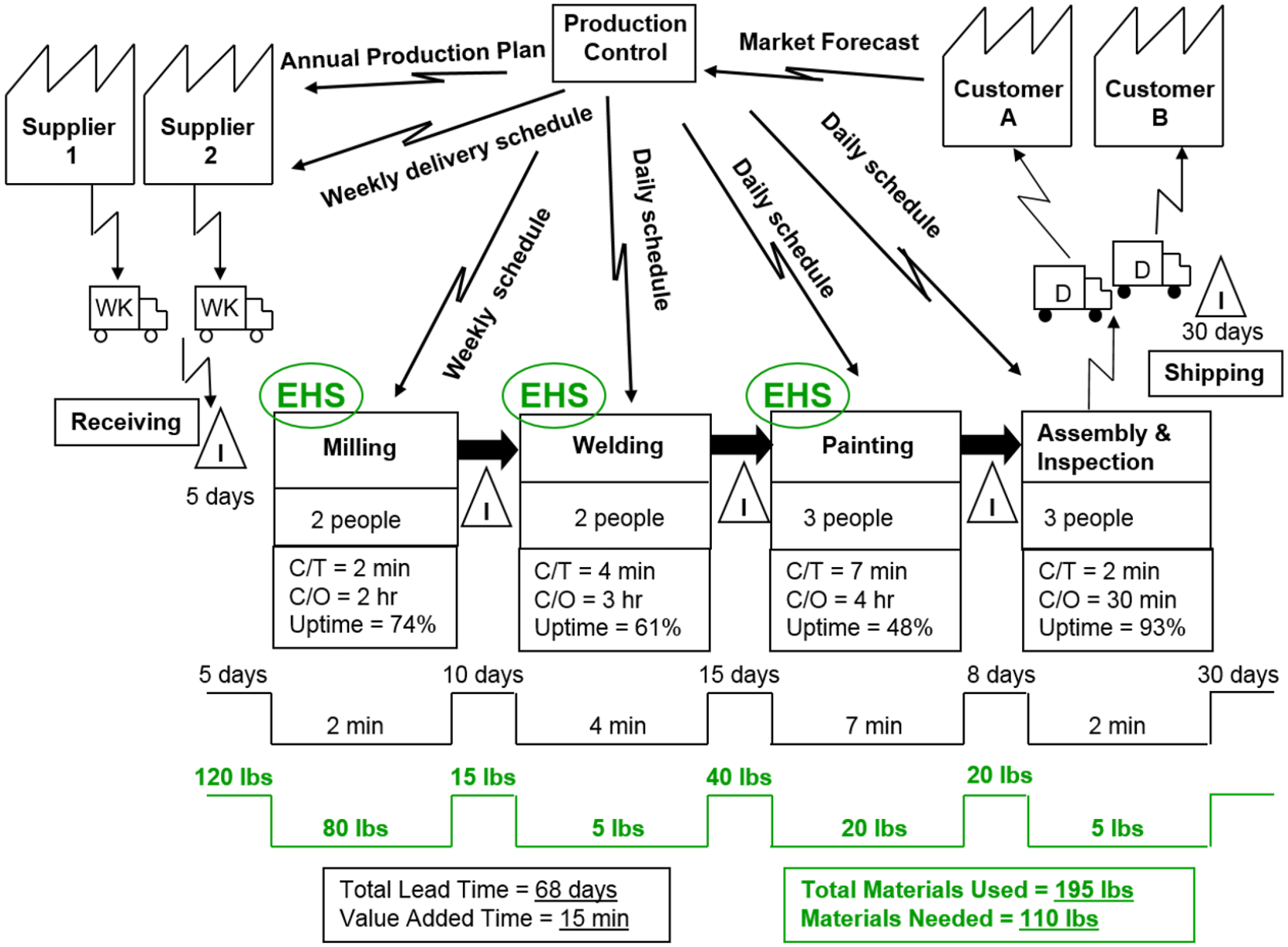
Simple text example

- Wastes generated at a vehicle repair shop –
  - 25 lbs/mo, mineral spirits, “Big Gunk Degreaser”
  - 10 lbs/mo, MEK solvent, “Little Gunk Degreaser”
  - 10 lbs/mo, toluene-contaminated single-use shop rags, cleaning parts
  - 75 lbs/mo, mud trap waste and mud pit wastewater, washing vehicles
  - 40 lbs/mo, used oil, vehicle maintenance

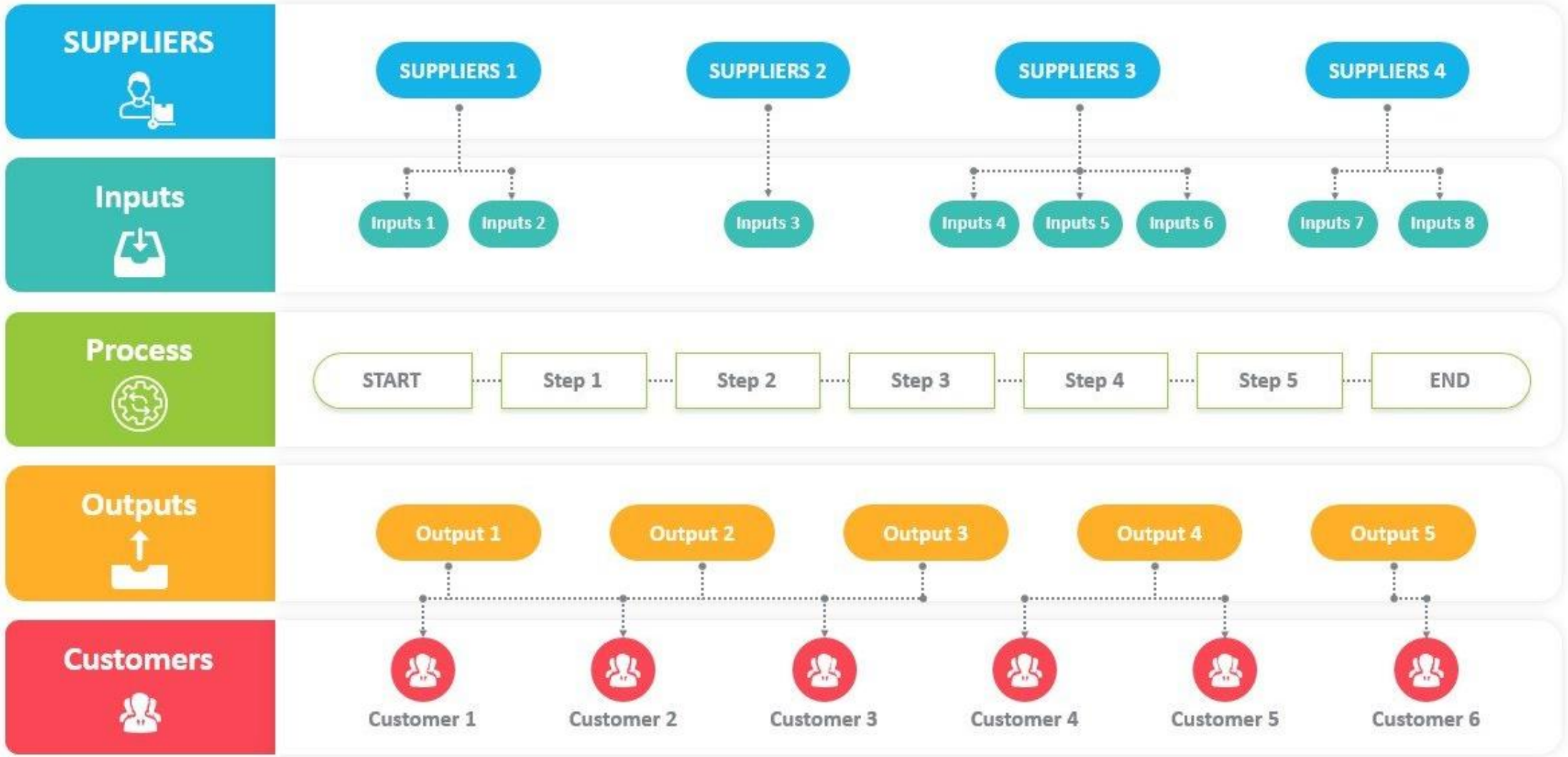
Box flow diagram



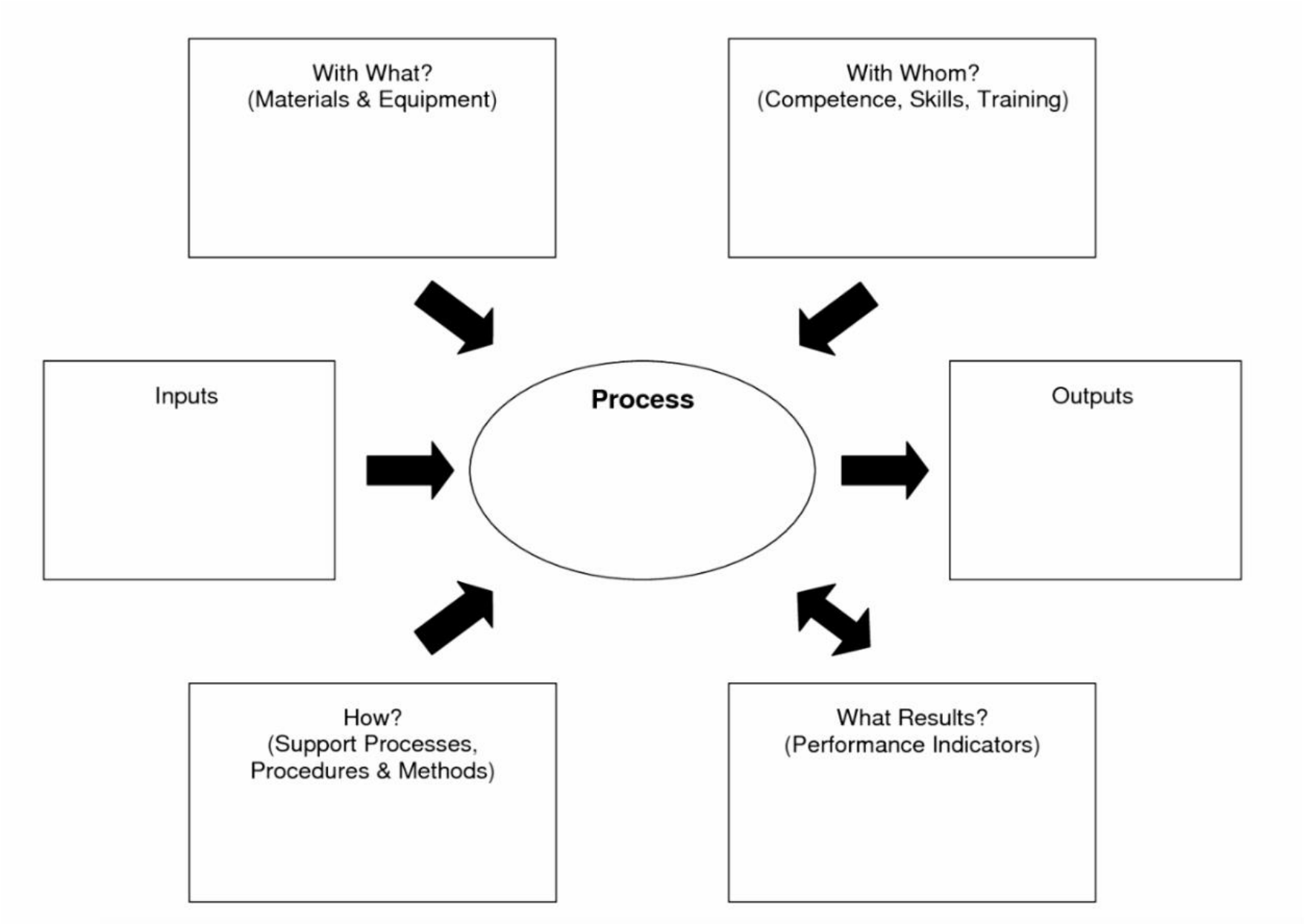
Value stream map



SIPOC diagram



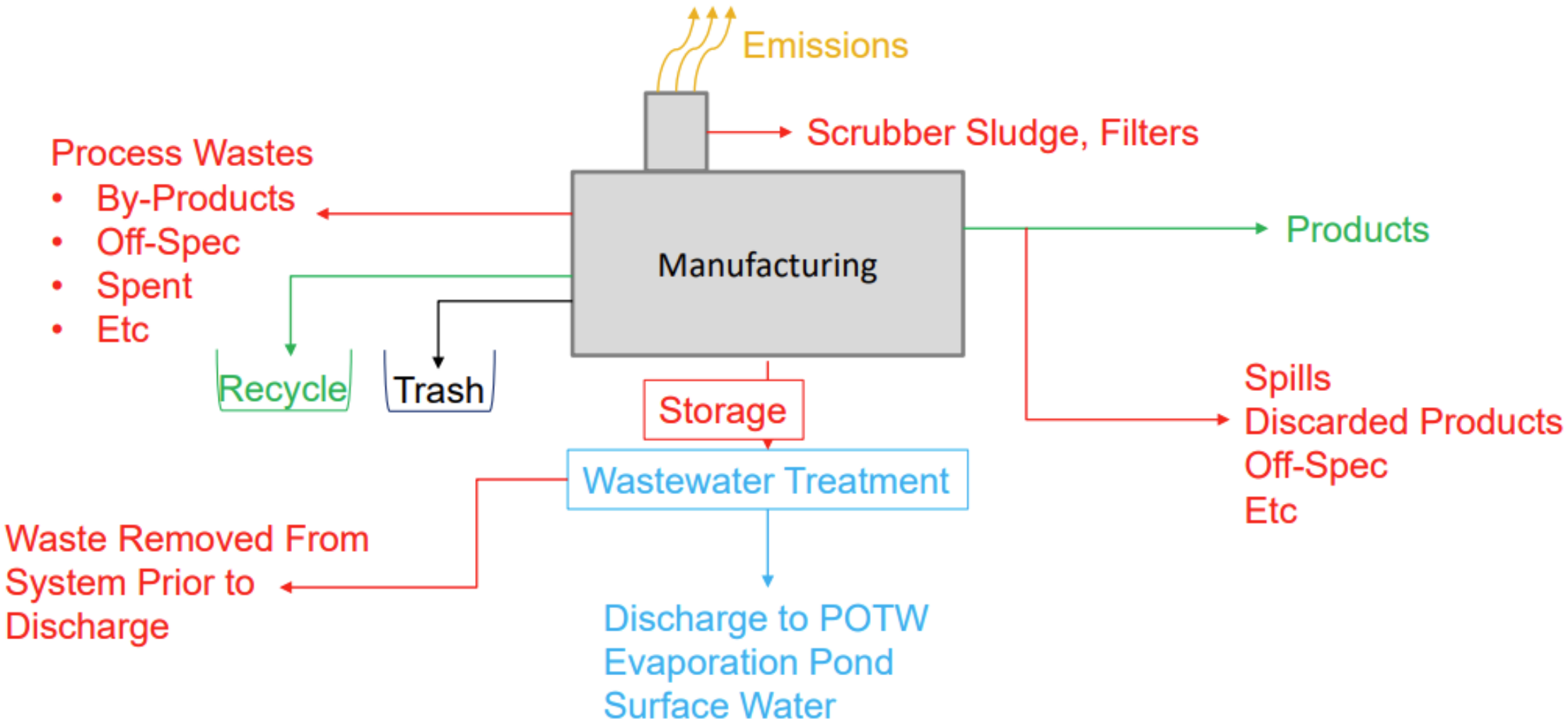
Turtle diagram



Whatever works and makes sense

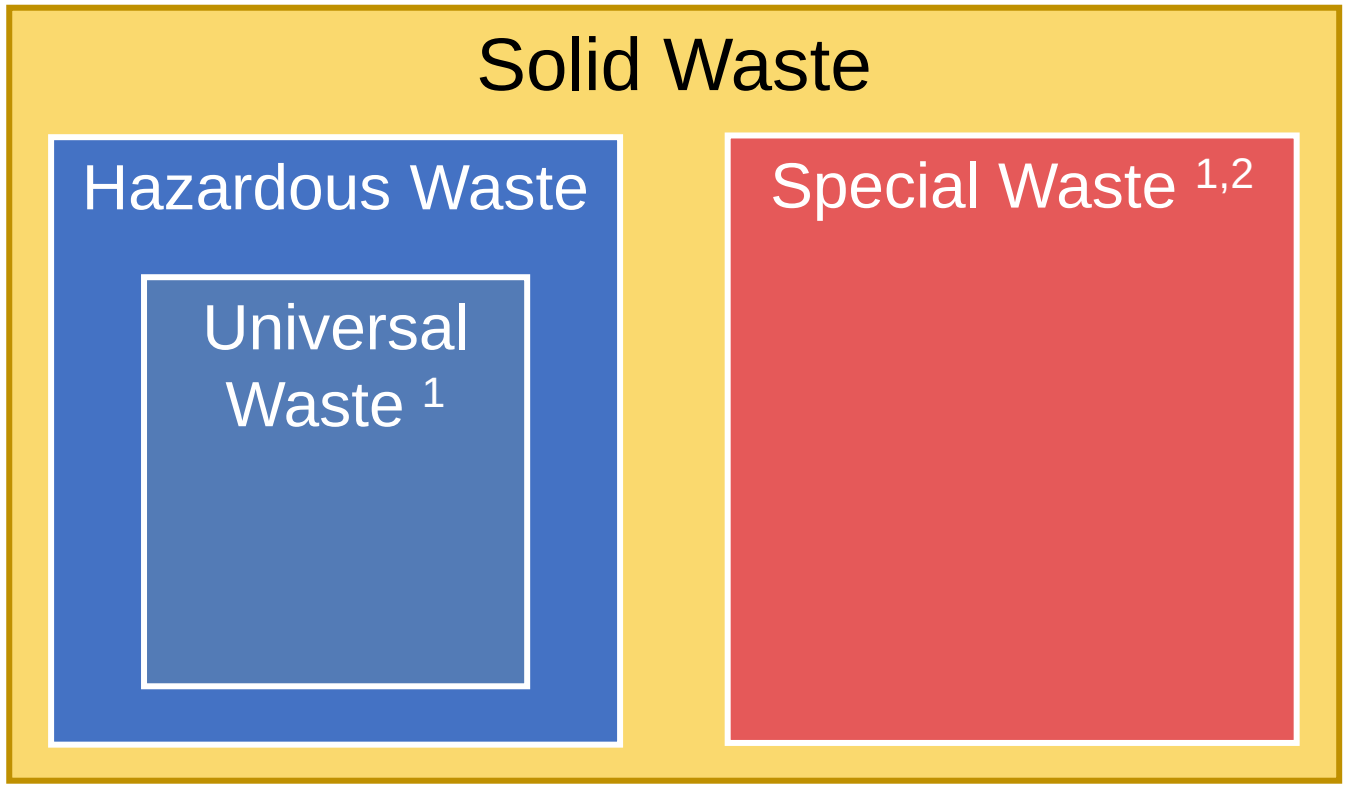
High-level, facility-wide process map from KDHE's 2021 Basic Hazardous Waste Generator Workshop training material, slide 27

RCRA "C"
RCRA "D"
CAA
CWA
Exempt



NOTE: This is an oversimplification of regulatory applicability. Reality may have additional considerations.

Framework to classify wastes



[1] Out of scope of presentation (ask if questions)
[2] Kansas's definition of "special waste" differs from federal definition

Other categories also exist, including:

- Municipal solid waste (MSW)
- Household hazardous waste (HHW)
- Construction and demolition waste (C&D)
- Medical waste
- Mixed waste
- And many others . . .

2/4 Solid waste

- Materials (solids, liquids, contained gasses, etc.) that have been discarded (40 CFR 261.2) by being:
  - Abandoned – see paragraph (b)
  - Recycled in certain ways – see paragraph (c)
  - Inherently waste-like – see paragraph (d)
  - Discarded military munitions – see 40 CFR 266.202
- Materials not considered solid waste include:
  - Anything that's not a waste
    - Process inputs
    - Legitimate inventory
  - Wastes explicitly excluded from "solid waste" (40 CFR 261.4(a)):
    - Domestic sewage
    - Certain scrap metals

Table 1 to 40 CFR 261.2; (*)'s indicate solid wastes https://www.ecfr.gov/current/title-40/section-261.2	Use constituting disposal (§ 261.2(c)(1))	Energy recovery/fuel (§ 261.2(c)(2))	Reclamation (§ 261.2(c)(3)), except as provided in §§ 261.4(a)(17), 261.4(a)(23), 261.4(a)(24) or 261.4(a)(27)	Speculative accumulation (§ 261.2(c)(4))
	1	2	3	4
Spent Materials	(*)	(*)	(*)	(*)
Sludges (listed in 40 CFR Part 261.31 or 261.32)	(*)	(*)	(*)	(*)
Sludges exhibiting a characteristic of hazardous waste	(*)	(*)	-	(*)
By-products (listed in 40 CFR 261.31 or 261.32)	(*)	(*)	(*)	(*)
By-products exhibiting a characteristic of hazardous waste	(*)	(*)	-	(*)
Commercial chemical products listed in 40 CFR 261.33	(*)	(*)	-	-
Scrap metal that is not excluded under 40 CFR 261.4(a)(13)	(*)	(*)	(*)	(*)

Note: *The terms "spent materials," "sludges," "by-products," and "scrap metal" and "processed scrap metal" are defined in § 261.1.*

Solid waste exclusions

Wastes Which Are Not Solid Wastes	40 CFR Citation for the Exclusion
Domestic Sewage and Mixtures of Domestic Sewage	§261.4(a)(1)
Point Source Discharge	§261.4(a)(2)
Irrigation Return Flow	§261.4(a)(3)
Radioactive Waste	§261.4(a)(4)
In-Situ Mining	§261.4(a)(5)
Pulping Liquors	§261.4(a)(6)
Spent Sulfuric Acid	§261.4(a)(7)
Reclamation in Enclosed Tanks	§261.4(a)(8)
Spent Wood Preservatives	§261.4(a)(9)
Coke By-Product Wastes	§261.4(a)(10)
Splash Condenser Dross Residue	§261.4(a)(11)
Hazardous Secondary Materials From the Petroleum Refining Industry	§261.4(a)(12)
Excluded Scrap Metal	§261.4(a)(13)
Shredded Circuit Boards	§261.4(a)(14)
Pulping Condensates Derived from Kraft Mill Steam Strippers	§261.4(a)(15)
Spent materials generated within the primary mineral processing industry from which minerals, acids, cyanide, water, or other values are recovered by mineral processing or by beneficiation	§261.4(a)(17)
Petrochemical recovered oil from an associated organic chemical manufacturing facility	§261.4(a)(18)
Spent caustic solutions from petroleum refining liquid treating processes used as a feedstock to produce cresylic or naphthenic acid	§261.4(a)(19)
Hazardous secondary materials used to make zinc fertilizers	§261.4(a)(20)
Zinc fertilizers made from hazardous wastes, or excluded hazardous secondary materials	§261.4(a)(21)
Used cathode ray tubes (CRTs)	§261.4(a)(22)
Hazardous secondary material generated and legitimately reclaimed within the United States or its territories and under the control of the generator	§261.4(a)(23)
Hazardous secondary material that is generated and then transferred for the purpose of reclamation is not a solid waste	§261.4(a)(24)
Solvent-contaminated wipes that are sent for cleaning and reuse are not solid wastes from the point of generation	§261.4(a)(26)
Hazardous secondary material that is generated and then transferred to another person for the purpose of remanufacturing is not a solid waste	§261.4(a)(27)

3/4 Hazardous waste

- Solid wastes harmful to human health or the environment
- To be hazardous waste, a solid waste must:
  - Meet one of four physical **characteristics** (40 CFR 261 Subpart C):
    - Ignitability flash point < 140 F
    - Corrosivity 2 > pH > 12.5
    - Reactivity explosive, autopolymerize
    - Toxicity contains leachable chemicals at certain concentrations – determined by TCLP analysis
  - **OR** be generated from certain **listed processes** (40 CFR 261 Subpart D):
    - Generic processes
    - Specific processes
    - Discarded chemical products
- Some wastes are excluded (40 CFR 261.4(b)), such as:
  - Household hazardous waste
  - Asbestos

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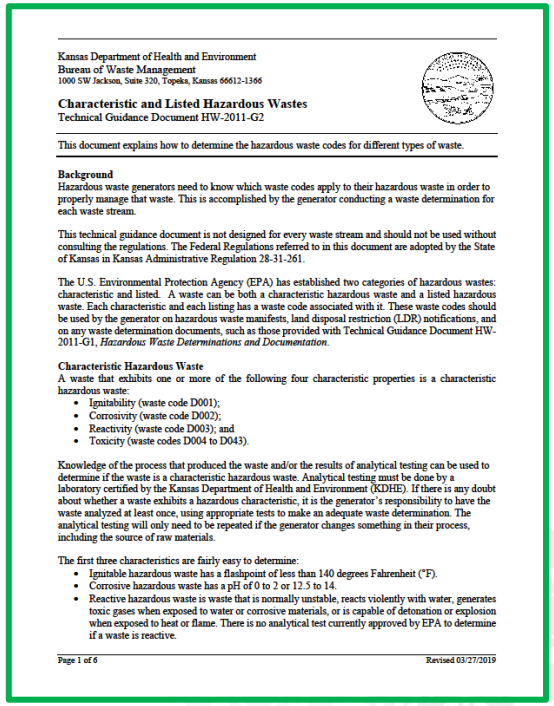
Hazardous waste exclusions

Solid Wastes Which Are Not Hazardous Wastes	CFR Citation for the Exclusion
Household Hazardous Waste	§261.4(b)(1)
Agricultural Waste	§261.4(b)(2)
Mining Overburden	§261.4(b)(3)
Fossil Fuel Combustion Waste (Bevill)	§261.4(b)(4)
Oil, Gas, and Geothermal Wastes (Bentsen Amendment)	§261.4(b)(5)
Trivalent Chromium Wastes	§261.4(b)(6)
Mining and Mineral Processing Wastes (Bevill)	§261.4(b)(7)
Cement Kiln Dust (Bevill)	§261.4(b)(8)
Arsenical-Treated Wood	§261.4(b)(9)
Petroleum Contaminated Media & Debris from Underground Storage Tanks	§261.4(b)(10)
Injected Groundwater	§261.4(b)(11)
Spent Chloroflurocarbon Refrigerants	§261.4(b)(12)
Used Oil Filters	§261.4(b)(13)
Used Oil Distillation Bottoms	§261.4(b)(14)
Landfill Leachate or Gas Condensate Derived from Certain Listed Wastes	§261.4(b)(15)
Project XL Pilot Project Exclusions	§261.4(b)(17)
Project XL Pilot Project Exclusions	§261.4(b)(18)

Hazardous waste codes

- Hazardous wastes are identified by one or more waste codes
  - **Characteristic waste** codes:
    - Ignitability D001
    - Corrosivity D002
    - Reactivity D003
    - Toxicity D004 to D043
  - **Listed waste** codes:
    - Generic processes (F-List) F001 to F039
    - Specific processes (K-List) K001 to K148
    - Discarded commercial chemical products
      - Acutely-hazardous (P-List) P001 to P205
      - Just hazardous (U-List) U001 to U411



Kansas Department of Health and Environment
Bureau of Waste Management
1000 SW Jackson, Suite 320, Topeka, Kansas 66612-1366

Characteristic and Listed Hazardous Wastes
Technical Guidance Document HW-2011-G2

This document explains how to determine the hazardous waste codes for different types of waste.

Background
Hazardous waste generators need to know which waste codes apply to their hazardous waste in order to properly manage that waste. This is accomplished by the generator conducting a waste determination for each waste stream.

This technical guidance document is not designed for every waste stream and should not be used without consulting the regulations. The Federal Regulations referred to in this document are adopted by the State of Kansas in Kansas Administrative Regulation 28-31-261.

The U.S. Environmental Protection Agency (EPA) has established two categories of hazardous wastes: characteristic and listed. A waste can be both a characteristic hazardous waste and a listed hazardous waste. Each characteristic and each listing has a waste code associated with it. These waste codes should be used by the generator on hazardous waste manifests, land disposal restriction (LDR) notifications, and on any waste determination documents, such as those provided with Technical Guidance Document HW-2011-G1, *Hazardous Waste Determinations and Documentation*.

Characteristic Hazardous Waste
A waste that exhibits one or more of the following four characteristic properties is a characteristic hazardous waste:
- Ignitability (waste code D001);
- Corrosivity (waste code D002);
- Reactivity (waste code D003); and
- Toxicity (waste codes D004 to D043).

Knowledge of the process that produced the waste and/or the results of analytical testing can be used to determine if the waste is a characteristic hazardous waste. Analytical testing must be done by a laboratory certified by the Kansas Department of Health and Environment (KDHE). If there is any doubt about whether a waste exhibits a hazardous characteristic, it is the generator's responsibility to have the waste analyzed at least once, using appropriate tests to make an adequate waste determination. The analytical testing will only need to be repeated if the generator changes something in their process, including the source of raw materials.

The first three characteristics are fairly easy to determine:
- Ignitable hazardous waste has a flashpoint of less than 140 degrees Fahrenheit (°F).
- Corrosive hazardous waste has a pH of 0 to 2 or 12.5 to 14.
- Reactive hazardous waste is waste that is normally unstable, reacts violently with water, generates toxic gases when exposed to water or corrosive materials, or is capable of detonation or explosion when exposed to heat or flame. There is no analytical test currently approved by EPA to determine if a waste is reactive.

Page 1 of 6 Revised 03/27/2019

(Clickable Object) Additional details can be found in KDHE BWM's TGD: *HW-2011-G2, Characteristic and Listed Hazardous Wastes*

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Hazardous waste codes

See KDHE BWM's *Hazardous Waste Generator Handbook* for full tables: kdhe.ks.gov/DocumentCenter/View/4882/Hazardous-Waste-Generator-Handbook-PDF

F-List – general processes

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)

K-List – specific processes

Inorganic pigments:		
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments	(T)
K003	Wastewater treatment sludge from the production of molybdate orange pigments	(T)

Toxic contaminants (characteristic)

EPA HW No.[1]	Contaminant	CAS No.[2]	Regulatory Level (mg/L)
D004	Arsenic	7440–38–2	5.0
D005	Barium	7440–39–3	100.0
D018	Benzene	71–43–2	0.5
D006	Cadmium	7440–43–9	1.0

TCLP leachate concentration limits **NOT** waste concentration limits

U-List – discarded hazardous commercial chemical products

U056	110–82–7	Benzene, hexahydro- (I)
U220	108–88–3	Benzene, methyl-
U105	121–14–2	Benzene, 1-methyl-2,4-dinitro-
U106	606–20–2	Benzene, 2-methyl-1,3-dinitro-
U055	98–82–8	Benzene, (1-methylethyl)- (I)
U169	98–95–3	Benzene, nitro-
U183	608–93–5	Benzene, pentachloro-
U185	82–68–8	Benzene, pentachloronitro-

P-List – discarded acutely hazardous commercial chemical products

P003	107–02–8	Acrolein
P070	116–06–3	Aldicarb
P203	1646–88–4	Aldicarb sulfone.
P004	309–00–2	Aldrin
P005	107–18–6	Allyl alcohol

U- and P-List chemicals must be the waste product's **sole active ingredient**; waste product must be **unused**

Hazardous waste examples

- Spent acids and bases (D002)
- Spent flammable, non-halogenated solvents (D001, F003)
  - Acetone, methanol, xylene . . .
- Distillation cake from spent acetone (D001, F003)
- Nicotine vape juice (P075)
- Discarded commercial mercury samples (D009, U151)
- PPE contaminated with HW (HW-dependent)
- Lithium-ion batteries (D003) [1]
- Solvent soaked rags (HW-dependent) [2]
- Hazardous industrial wastewater (HW-dependent) [3]

What about empty containers?
If "RCRA empty" (see 40 CFR 261.7), they are not hazardous waste

[1] Lithium batteries can be managed as universal waste when recycled.
[2] Solvent soaked rags can be excluded from certain waste regulations if managed according to specific exclusion standards.
[3] Per 40 CFR 261.4(a)(2), industrial wastewater is excluded from the definition of solid waste once it becomes a point source discharge subject to section 402 of the CWA.

How to identify waste codes

1. **Use process knowledge**
   - Process maps – what material goes into the waste generating process?
   - SDS data – what are the chemical compositions and characteristics of the material going into the waste generating process?
   - Industry knowledge – what occurs during the waste generating process?

2. **Use laboratory testing**
   - Send a waste sample to a KDHE-certified lab (must be certified)
     - Find list of appropriate labs here: kdhe.ks.gov/1286/Environmental-Laboratory-Accreditation
   - Analyze lab results to identify which waste codes apply, if any
   - Can be more expensive and take longer than using process knowledge, but it can be more reliable and provide confidence

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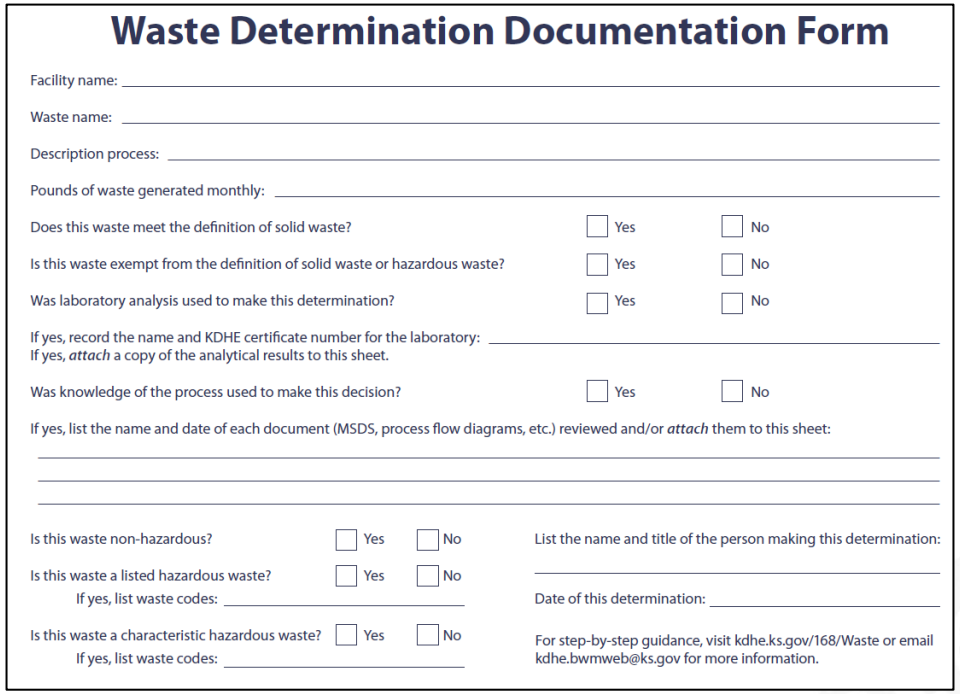
4/4 Fill the form

TGD HW-2011-G1 page 3; Hazardous Waste Generator Handbook page 8

- Describe waste stream and its process
- Conclusively state if it is HW or not HW
  - If HW, list all applicable waste codes
- State reasoning and attach resources used
- Many forms available



Waste Determination Documentation Form

Facility name: _____

Waste name: _____

Description process: _____

Pounds of waste generated monthly: _____

Does this waste meet the definition of solid waste? ☐ Yes ☐ No

Is this waste exempt from the definition of solid waste or hazardous waste? ☐ Yes ☐ No

Was laboratory analysis used to make this determination? ☐ Yes ☐ No

If yes, record the name and KDHE certificate number for the laboratory: _____
If yes, *attach* a copy of the analytical results to this sheet.

Was knowledge of the process used to make this decision? ☐ Yes ☐ No

If yes, list the name and date of each document (MSDS, process flow diagrams, etc.) reviewed and/or *attach* them to this sheet:

_____

_____

_____

Is this waste non-hazardous? ☐ Yes ☐ No

Is this waste a listed hazardous waste? ☐ Yes ☐ No
If yes, list waste codes: _____

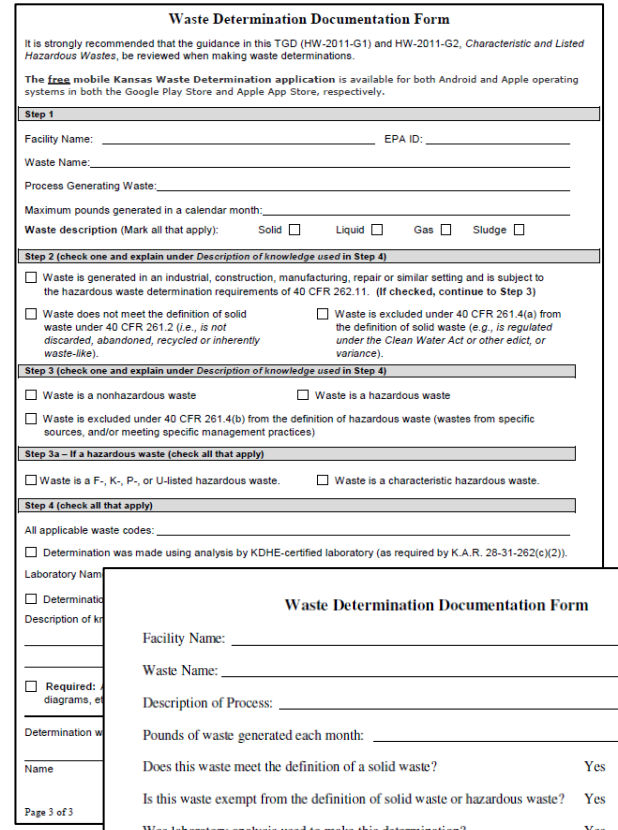
Is this waste a characteristic hazardous waste? ☐ Yes ☐ No
If yes, list waste codes: _____

List the name and title of the person making this determination: _____

Date of this determination: _____

For step-by-step guidance, visit kdhe.ks.gov/168/Waste or email kdhe.bwmweb@ks.gov for more information.

Last page of SBEAP 2024 HW Compliance Calendar



Waste Determination Documentation Form

It is strongly recommended that the guidance in this TGD (HW-2011-G1) and HW-2011-G2, *Characteristic and Listed Hazardous Wastes*, be reviewed when making waste determinations.

The free mobile Kansas Waste Determination application is available for both Android and Apple operating systems in both the Google Play Store and Apple App Store, respectively.

Step 1

Facility Name: _____ EPA ID: _____

Waste Name: _____

Process Generating Waste: _____

Maximum pounds generated in a calendar month: _____

Waste description (Mark all that apply): Solid ☐ Liquid ☐ Gas ☐ Sludge ☐

Step 2 (check one and explain under *Description of knowledge used* in Step 4)

☐ Waste is generated in an industrial, construction, manufacturing, repair or similar setting and is subject to the hazardous waste determination requirements of 40 CFR 262.11. **(If checked, continue to Step 3)**

☐ Waste does not meet the definition of solid waste under 40 CFR 261.2 (*i.e., is not discarded, abandoned, recycled or inherently waste-like*).

☐ Waste is excluded under 40 CFR 261.4(a) from the definition of solid waste (*e.g., is regulated under the Clean Water Act or other edict, or variance*).

Step 3 (check one and explain under *Description of knowledge used* in Step 4)

☐ Waste is a nonhazardous waste ☐ Waste is a hazardous waste

☐ Waste is excluded under 40 CFR 261.4(b) from the definition of hazardous waste (wastes from specific sources, and/or meeting specific management practices)

Step 3a – If a hazardous waste (check all that apply)

☐ Waste is a F-, K-, P-, or U-listed hazardous waste. ☐ Waste is a characteristic hazardous waste.

Step 4 (check all that apply)

All applicable waste codes: _____

☐ Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Nam

☐ Determinatio

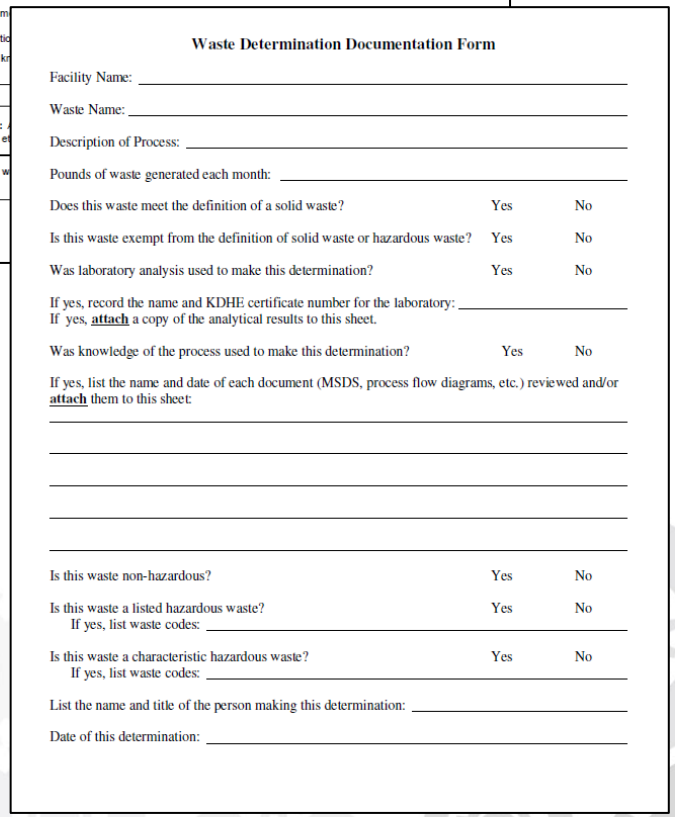
Description of kn

☐ **Required:** A diagrams, et

Determination w

Name

Page 3 of 3



Waste Determination Documentation Form

Facility Name: _____

Waste Name: _____

Description of Process: _____

Pounds of waste generated each month: _____

Does this waste meet the definition of a solid waste? Yes No

Is this waste exempt from the definition of solid waste or hazardous waste? Yes No

Was laboratory analysis used to make this determination? Yes No

If yes, record the name and KDHE certificate number for the laboratory: _____
If yes, **attach** a copy of the analytical results to this sheet.

Was knowledge of the process used to make this determination? Yes No

If yes, list the name and date of each document (MSDS, process flow diagrams, etc.) reviewed and/or **attach** them to this sheet:

_____

_____

_____

_____

_____

Is this waste non-hazardous? Yes No

Is this waste a listed hazardous waste? Yes No
If yes, list waste codes: _____

Is this waste a characteristic hazardous waste? Yes No
If yes, list waste codes: _____

List the name and title of the person making this determination: _____

Date of this determination: _____

Common pitfalls

- **Not making waste determinations**
  - Map your waste streams and be sure to address them all
- Not correcting outdated waste determinations
  - Try to review your forms on an annual basis or when processes change
- Making inaccurate waste determinations
  - If you use a third party to make your assessments, be sure to double check their work
    - EPA lists relying completely on third parties as the second topmost reason for inaccurate waste determinations
- Using a vendor's waste profile report by itself as a waste determination
  - This can be used in support of a determination, but it is not a determination itself
- Misplacing determinations and / or supporting documentation
  - If there are no records of it, then did it ever really happen? NO

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Step-by-step example

1. List the waste streams generated at your facility

2. Identify which are solid waste streams*

3. Identify which are hazardous waste streams and why*

4. Document all solid and hazardous waste stream determinations per waste determination form

*Evaluated at the **point of generation** (before the waste's characteristics might change; if properties change, reassess)

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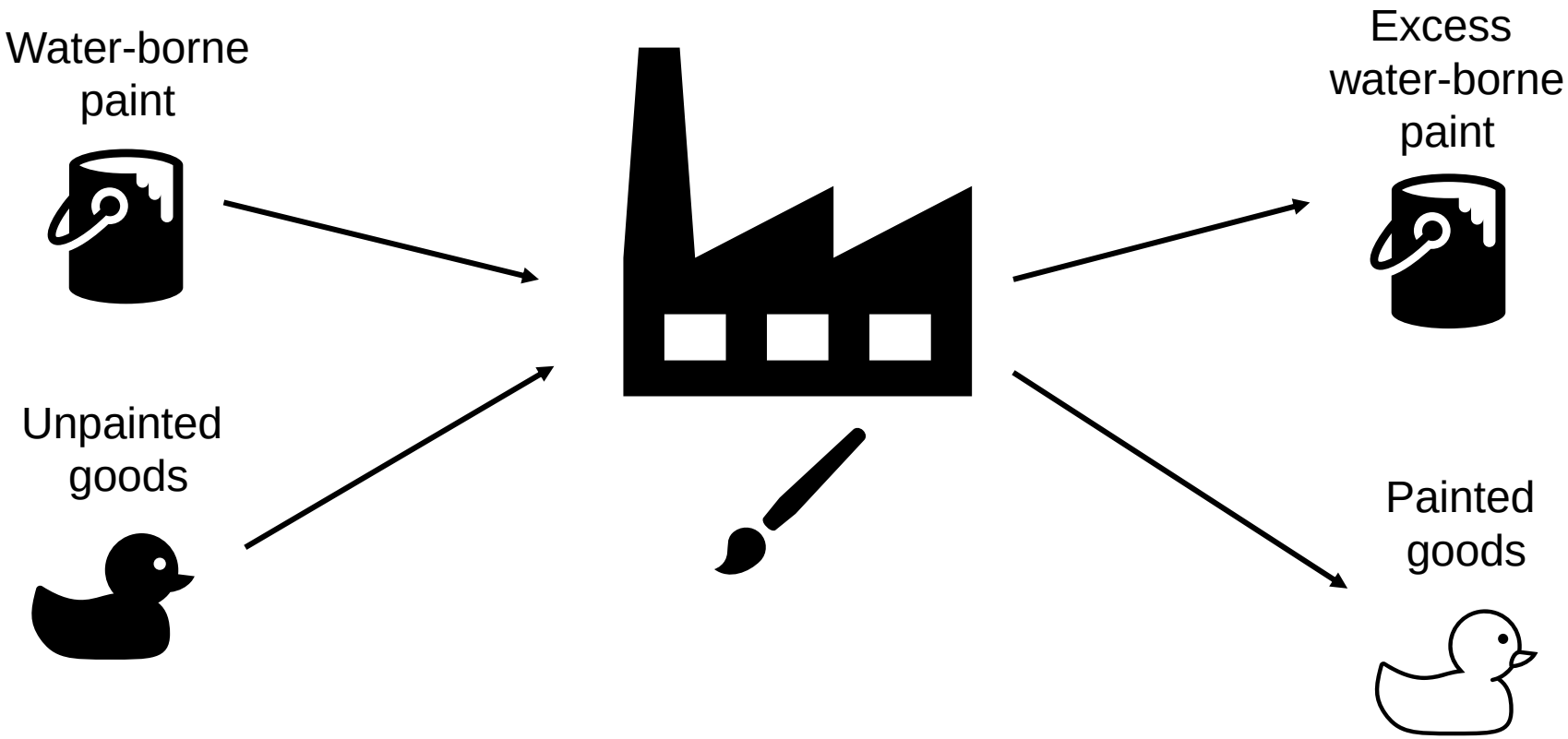
We work at a company that applies a one-part, water-borne paint onto plastic parts.
We mapped two inputs and two outputs from the paint step:

- Inputs: unpainted parts; unused paint
- Outputs: 30 lbs/mo painted parts; 10 lbs/mo excess paint

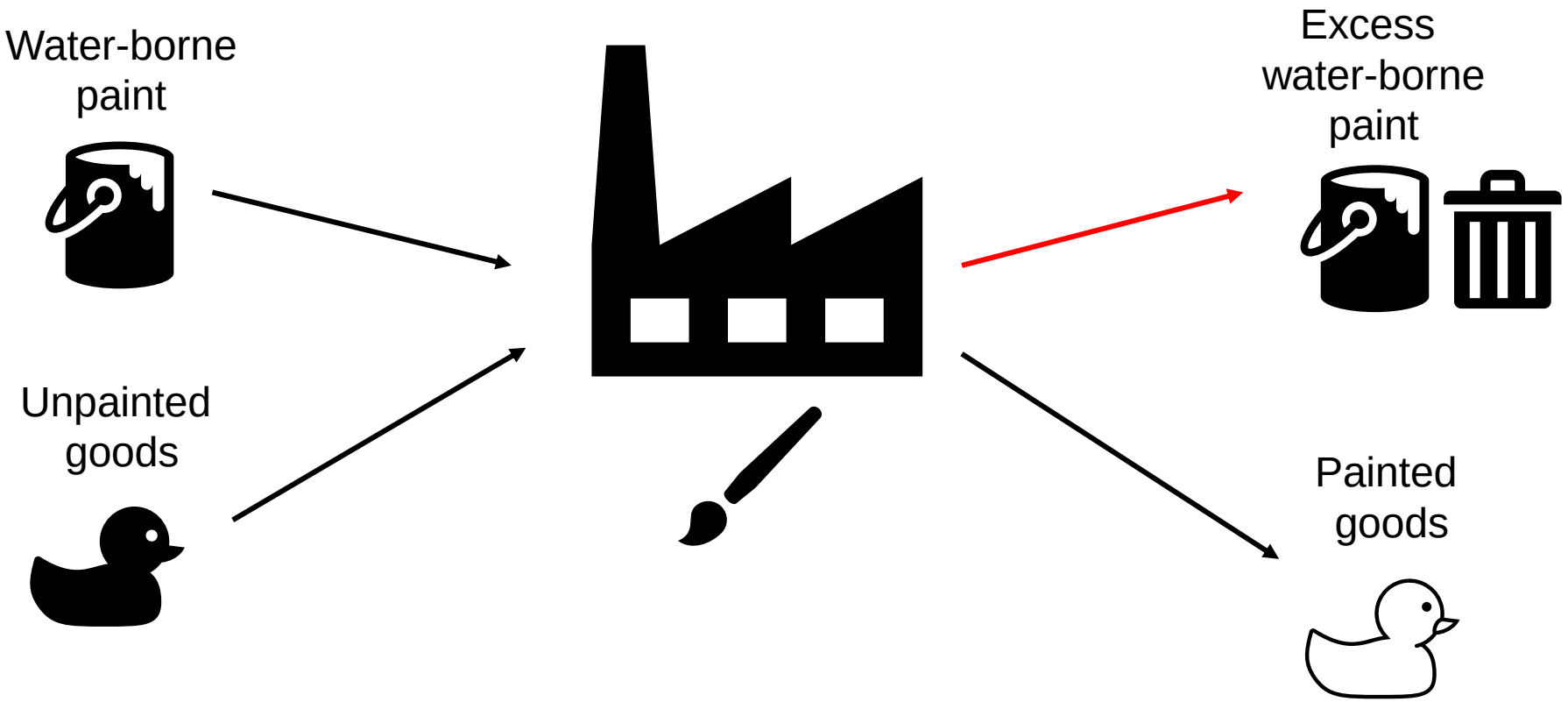


Is this excess paint a solid waste?

Only if discarded and no exclusions apply

The excess paint is discarded and no exclusions apply, so we review its SDS and find

- Its flash point is above 140 F,
- Its pH is ~8, and
- It does not contain any toxic or reactive chemicals



Is the excess paint a characteristic hazardous waste?

No – it's nonflammable, stable, relatively pH neutral, and does not contain any toxic contaminants

Could it be listed hazardous waste?

Not under the current process

Step 1

Facility Name: Duck Painters Inc. EPA ID: Out of scope (ask if Q's, tho)

Waste Name: Water-borne paint

Process Generating Waste: Duck painting line 2

Maximum pounds generated in a calendar month: 10 lbs/mo

Waste description (Mark all that apply): Solid ☐ Liquid ☒ Gas ☐ Sludge ☐

Step 2 (check one and explain under *Description of knowledge used* in Step 4)

☒ Waste is generated in an industrial, construction, manufacturing, repair or similar setting and is subject to the hazardous waste determination requirements of 40 CFR 262.11. **(If checked, continue to Step 3)**

☐ Waste does not meet the definition of solid waste under 40 CFR 261.2 (*i.e., is not discarded, abandoned, recycled or inherently waste-like*).

☐ Waste is excluded under 40 CFR 261.4(a) from the definition of solid waste (*e.g., is regulated under the Clean Water Act or other edict, or variance*).

Step 3 (check one and explain under *Description of knowledge used* in Step 4)

☒ Waste is a nonhazardous waste

☐ Waste is a hazardous waste

☐ Waste is excluded under 40 CFR 261.4(b) from the definition of hazardous waste (wastes from specific sources, and/or meeting specific management practices)

Step 3a – If a hazardous waste (check all that apply)

☐ Waste is a F-, K-, P-, or U-listed hazardous waste. ☐ Waste is a characteristic hazardous waste.

Step 4 (check all that apply)

All applicable waste codes: _____

☐ Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Name: _____ Analytical Report Date: _____

☒ Determination was made using process knowledge.

Description of knowledge used: Knowledge of process inputs and process mechanisms combined with SDS data

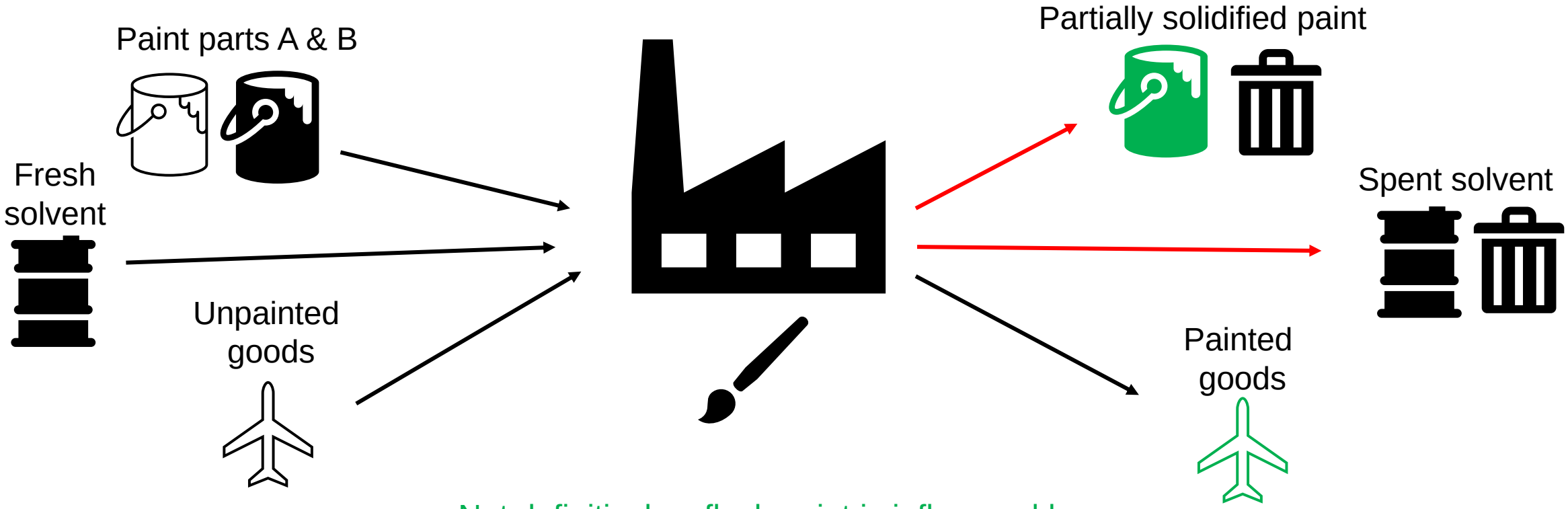
☒ **Required:** All records used to make the determination (Safety Data Sheet (SDS), process description/flow diagrams, etc.) are attached or otherwise maintained on site.

Determination was made by:

Jacob Larson	Presenter	Oct 8, 2024
Name	Title	Date

We work at an aerospace company that applies a two-part, solvent-borne paint onto metal parts. We mapped four inputs and three outputs from the paint step:

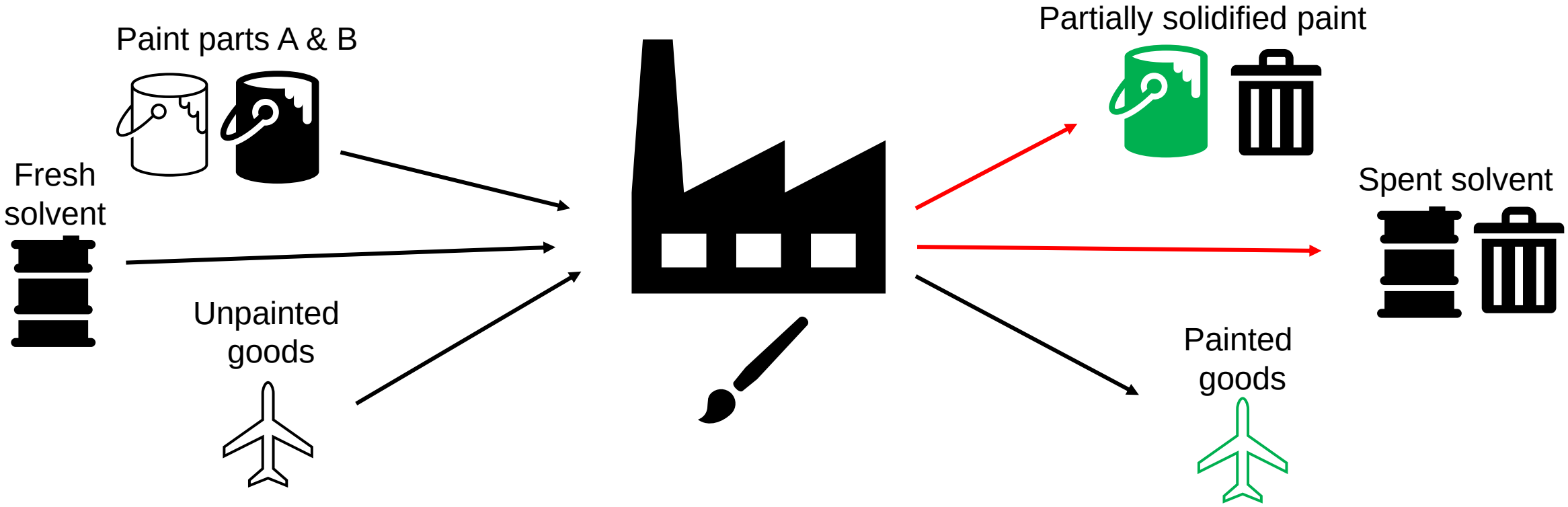
- Inputs: unpainted metal; paint part-A; paint part-B; solvent
- Outputs: painted metal; 20 lbs/mo partially solidified mixed paint; 40 lbs/mo spent solvent



Can we already tell if the paint waste is an ignitable characteristic waste?

Not definitively – flash point is influenced by carrier solvents that evaporate as paint solidifies; without evidence showing it as non-flammable though, best practice is to manage it as an ignitable characteristic waste

We review the SDS for parts-A and -B and find one contains chromium at 10 mg/L, a potential hazardous waste constituent under waste code D007 (toxicity), and the flash point for both is less than 140 F



Can we already tell if the paint waste is a toxic characteristic waste?

No – while process knowledge can reliably tell you if a waste is <u>not</u> toxic or <u>might be</u> toxic; it cannot reliably tell you if a waste <u>is</u> toxic

How do we determine if the paint waste is hazardous?

Assess for exclusions; if no exclusions apply, send to a lab for TCLP analysis and assess for listed wastes

Step 1

Facility Name: Plane Strut Painters Inc. EPA ID: Out of scope (ask if Q's, tho)

Waste Name: Chromium-bearing paint waste

Process Generating Waste: Strut painting line 2

Maximum pounds generated in a calendar month: 20 lbs/mo

Waste description (Mark all that apply): Solid [X] Liquid [ ] Gas [ ] Sludge [ ]

Step 2 (check one and explain under *Description of knowledge used* in Step 4)

[X] Waste is generated in an industrial, construction, manufacturing, repair or similar setting and is subject to the hazardous waste determination requirements of 40 CFR 262.11. **(If checked, continue to Step 3)**

[ ] Waste does not meet the definition of solid waste under 40 CFR 261.2 (*i.e., is not discarded, abandoned, recycled or inherently waste-like*).

[ ] Waste is excluded under 40 CFR 261.4(a) from the definition of solid waste (*e.g., is regulated under the Clean Water Act or other edict, or variance*).

Step 3 (check one and explain under *Description of knowledge used* in Step 4)

[ ] Waste is a nonhazardous waste

[X] Waste is a hazardous waste

[ ] Waste is excluded under 40 CFR 261.4(b) from the definition of hazardous waste (wastes from specific sources, and/or meeting specific management practices)

Step 3a – If a hazardous waste (check all that apply)

☐ Waste is a F-, K-, P-, or U-listed hazardous waste.

☒ Waste is a characteristic hazardous waste.

Step 4 (check all that apply)

All applicable waste codes: D001 (ignitability), D007 (toxicity)

☒ Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Name: Labs Unlimited Analytical Report Date: Oct 1, 2024

☒ Determination was made using process knowledge.

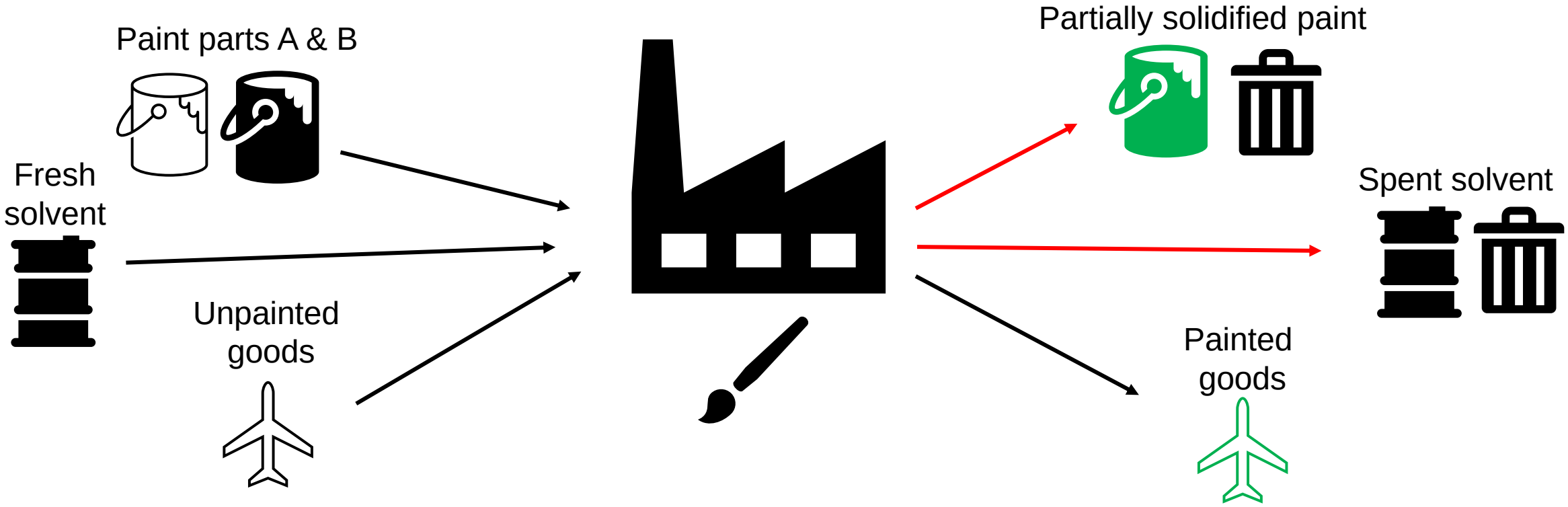
Description of knowledge used: Knowledge of process inputs and process mechanisms combined with SDS data

☒ **Required:** All records used to make the determination (Safety Data Sheet (SDS), process description/flow diagrams, etc.) are attached or otherwise maintained on site.

Determination was made by:

Jacob Larson	Presenter	Oct 8, 2024
Name	Title	Date

Likewise, we review the solvent SDS and find its flash point is less than 140 F



Is the spent solvent an ignitable characteristic waste?

Most likely – the spent solvent's flash point is likely the same as for the fresh solvent

How else might the spent solvent be hazardous waste?

It could be carrying enough chromium from the paint to be toxic waste, and it might also fall under a listed process

Step 1

Facility Name: Plane Strut Painters Inc. EPA ID: Out of scope (ask if Q's, tho)

Waste Name: Spent solvent from chromium-bearing paint processes

Process Generating Waste: Strut painting line 2

Maximum pounds generated in a calendar month: 40 lbs/mo

Waste description (Mark all that apply): Solid ☐ Liquid ☒ Gas ☐ Sludge ☐

Step 2 (check one and explain under *Description of knowledge used* in Step 4)

☒ Waste is generated in an industrial, construction, manufacturing, repair or similar setting and is subject to the hazardous waste determination requirements of 40 CFR 262.11. **(If checked, continue to Step 3)**

☐ Waste does not meet the definition of solid waste under 40 CFR 261.2 (*i.e., is not discarded, abandoned, recycled or inherently waste-like*).

☐ Waste is excluded under 40 CFR 261.4(a) from the definition of solid waste (*e.g., is regulated under the Clean Water Act or other edict, or variance*).

Step 3 (check one and explain under *Description of knowledge used* in Step 4)

☐ Waste is a nonhazardous waste

☒ Waste is a hazardous waste

☐ Waste is excluded under 40 CFR 261.4(b) from the definition of hazardous waste (wastes from specific sources, and/or meeting specific management practices)

Step 3a – If a hazardous waste (check all that apply)

[X] Waste is a F-, K-, P-, or U-listed hazardous waste.

[X] Waste is a characteristic hazardous waste.

Step 4 (check all that apply)

All applicable waste codes: D001 (ignitability), D007 (toxicity), F003 (generic process, spent solvent)

[X] Determination was made using analysis by KDHE-certified laboratory (as required by K.A.R. 28-31-262(c)(2)).

Laboratory Name: Labs Unlimited Analytical Report Date: Oct 1, 2024

[X] Determination was made using process knowledge.

Description of knowledge used: Knowledge of process inputs and process mechanisms combined with SDS data

[X] **Required:** All records used to make the determination (Safety Data Sheet (SDS), process description/flow diagrams, etc.) are attached or otherwise maintained on site.

Determination was made by:

Jacob Larson	Presenter	Oct 8, 2024
Name	Title	Date

Reality can be more complicated

Be thorough, be methodical, be diligent – if you need help, ask!

Pollution Prevention Institute

Questions?

Jacob Larson

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- 800-578-8898 (hotline)
- sbeap.org

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