

Hazardous Waste Determination



The Cornerstone of Hazardous Waste Management

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Compliance & Enforcement

Hazardous Waste Determination Procedure

1. Is it a **waste**?
2. Is it **exempt** from the rules?
3. Is it a **listed** waste?
4. Is it a **characteristic** waste?
5. Is it a hazardous waste **mixture**?



Hazardous Waste- What is it?

Waste

Anything that is **SPENT, DISCARDED** or **ABANDONED**

Hazardous

Potential Threat to Human Health or the Environment

A material must first be a waste
before it can be classified a hazardous waste

Waste



Spent-

A material that has been used and can no longer be used for its intended purpose without being processed (*filtered, reconstituted, cleaned, etc...*).

Waste



Discarded-

Anything that is abandoned, recycled, disposed of, burned, or incinerated – you make a decision



Waste

Abandoned- Anything that is disposed of, burned or incinerated; **OR**

Anything that is accumulated, stored or treated (but not recycled) before being disposed of, burned, or incinerated.



Abandoned



Exemptions

Not Regulated as Hazardous Waste

- Certain specific wastes are not regulated for various reasons



Examples:

- Wastewater discharges regulated by other programs
- Medicinal nitroglycerine
- Scrap metal
- Used CFC refrigerants (if refrigerant is reclaimed)
- Empty Containers

Waste Numbers (“codes”)

All hazardous wastes are identified by either an EPA or state waste code:

EPA Waste Codes

P, U, F, K, or D followed by 3 numbers
“D001”, “F003”, K051 etc...

Waste Codes

Why? - Allow wastes and hazards to be easily identified

Waste codes provide instructions to Treatment, Storage & Disposal Facilities (TSDFs) regarding how to properly treat, deactivate or destroy the waste and its associated hazard.

TREATMENT STANDARDS FOR HAZARDOUS WASTES NOTE: NA means not applicable

WASTE CODE	WASTE DESCRIPTION AND TREATMENT/REGULATORY SUBCATEGORY ¹	REGULATED HAZARDOUS CONSTITUENT		WASTEWATERS	NONWASTEWATERS
		Common Name	CAS ² Number	Concentration in mg/L, ³ or Technology Code ⁴	Concentration in mg/L ³ unless noted as "mg/L TCLP," or Technology Code ⁴
X01 ¹	Ignitable Characteristic Wastes, except for the §261.21(a)(1) High TOC Subcategory ¹	NA	NA	DEACT and meet §268.48 standards ⁴ , or RORGIS, or CMBST	DEACT and meet §268.48 standards ⁴ , or RORGIS, or CMBST
		NA	NA	NA	RORGIS, CMBST, or PGLYM
D002 ¹	Corrosive Characteristic Wastes	NA	NA	DEACT and meet §268.48 standards ⁴	DEACT and meet §268.48 standards ⁴
		NA	NA	NA	NA
D002, D004, D005, D006, D007, D008, D009, D010, D011	Radioactive high level wastes generated during the reprocessing of fuel rods. (Note: This subcategory consists of nonwastewaters only.)	Corrosivity (pH)	NA	NA	HLVIT
		Arsenic	7440-38-2	NA	HLVIT
		Barium	7440-39-3	NA	HLVIT
		Cadmium	7440-43-9	NA	HLVIT
		Chromium (Total)	7440-47-3	NA	HLVIT
		Lead	7439-92-1	NA	HLVIT
		Mercury	7439-97-6	NA	HLVIT
		Selenium	7782-49-2	NA	HLVIT
		Silver	7440-22-4	NA	HLVIT
		NA	NA	DEACT	DEACT
D003 ¹	Reactive Sulfides Subcategory based on 261.23(a)(5)	NA	NA	DEACT	DEACT
	Explosives Subcategory based on 261.23(a)(6), (7), and (8)	NA	NA	DEACT and meet §268.48 standards ⁴	DEACT and meet §268.48 standards ⁴

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		Common Name	CAS ² Number	Concentration in mg/L, ³ or Technology Code ⁴	Concentration in mg/L ³ unless noted as "mg/L TCLP," or Technology Code ⁴
	Unexploded ordnance and other explosive devices which have been the subject of an emergency response	NA	NA	DEACT	DEACT
	Other Reactives Subcategory based on 261.23(a)(1)	NA	NA	DEACT and meet §268.48 standards ⁴	DEACT and meet §268.48 standards ⁴
	Water Reactive Subcategory based on 261.23(a)(2), (3), and (4). (Note: This subcategory consists of nonwastewaters only.)	NA	NA	NA	DEACT and meet §268.48 standards ⁴
	Reactive Cyanides Subcategory based on 261.23(a)(5)	Cyanides (Total) ¹	57-12-5	Reserved	590
		Cyanides (Amenable) ¹	57-12-5	0.86	30
D004 ¹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for arsenic based on the toxicity characteristic leaching procedure (TCLP) in SW846	Arsenic	7440-38-2	1.4 and meet §268.48 standards ⁴	5.0 mg/L TCLP and meet §268.48 standards ⁴
D005 ¹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for barium based on the toxicity characteristic leaching procedure (TCLP) in SW846	Barium	7440-39-3	1.2 and meet §268.48 standards ⁴	21 mg/L TCLP and meet §268.48 standards ⁴
D006 ¹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for cadmium based on the toxicity characteristic leaching procedure (TCLP) in SW846	Cadmium	7440-43-9	0.69 and meet §268.48 standards ⁴	0.11 mg/L TCLP and meet §268.48 standards ⁴
		Cadmium Containing Batteries Subcategory. (Note: This subcategory consists of nonwastewaters only.)	Cadmium	7440-43-9	NA
D007 ¹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for chromium based on the toxicity characteristic leaching procedure (TCLP) in SW846	Chromium (Total)	7440-47-3	2.77 and meet §268.48 standards ⁴	0.60 mg/L TCLP and meet §268.48 standards ⁴

Hazardous Waste Definition

There are two ways we can identify a hazardous waste:

1. The waste is specifically listed as hazardous
2. The waste has a characteristic property

Listed Wastes

P001-P205

F001-F039

U001-U411

K001-K178

Characteristic Wastes

D001-D043

Listed Hazardous Wastes

We can categorize the waste lists even further:

1. Unused Discarded/Abandoned Products

- P-list
- U-list

2. Certain wastes Used in processes

- K-list
- F-list

UNUSED LISTED WASTES

Discarded or Abandoned Commercial Chemical Products

“P” waste codes= Acutely hazardous waste

“U” waste codes= Toxic hazardous wastes

Either the chemical is specifically listed (named) or the **Sole Active Ingredient** of the product is specifically listed.

Sole Active Ingredient

- The ONE chemical in the product that makes it do what it's supposed to
 - You have to figure out what each chemical in the product does
 - If two or more chemicals do the same thing, it's not a sole active ingredient
 - Even if they're both on the list
 - If there is one chemical that makes it do what it's supposed to, and it's not on the P or U-list, then the entire waste is not on the P or U-list

To be a “P” or “U” – listed waste

1. It must be unused
2. It must have a “sole active ingredient”;
and
3. The sole active ingredient must be on the
“P” or the “U” list

Are these “P” or “U” –listed?

- Pure acetone getting thrown out
- A product blend of acetone (solvent), xylene (solvent), and orange scent getting thrown out
- A blend of acetone solvent and blue dye #2 colorant getting thrown out
- Pure 1,3,7-trimethylxanthine getting thrown out



P & U Listed Waste



USED LISTED WASTES

“F” waste codes – Non-Specific Source Wastes

3 broad categories

- Spent Solvents
- Electroplating/Chemical Metal-working
- Chemical Manufacture

“K” waste codes - Specific Source Wastes

Wastes from one of 18 specific industries

Wood preservation, Organic chemicals,
Pesticides, Explosives, Ink formulation, etc.

F-Listed Waste



Plating sludge

F-Listed Waste



K-Listed Waste

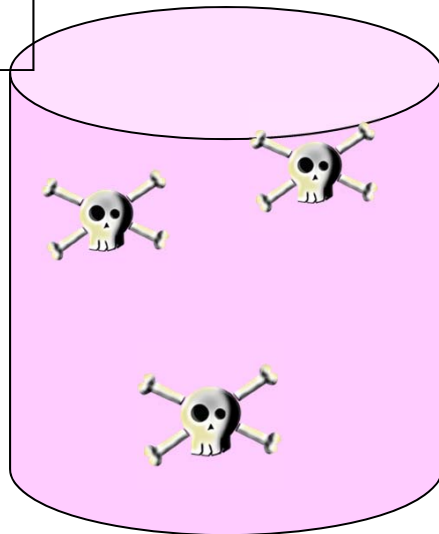


Iron & Steel Industry

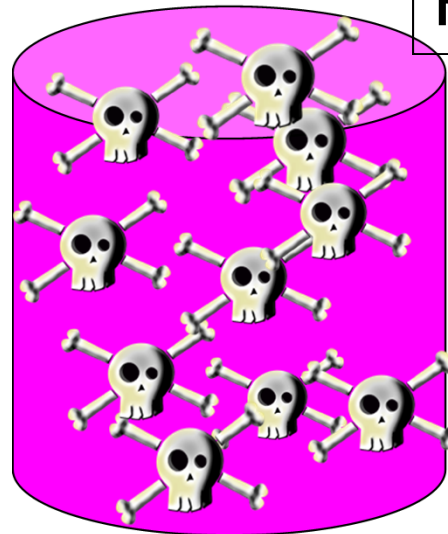
With LISTED wastes...

The concentration of the bad stuff
in the waste doesn't matter

P081



P081



Characteristic Wastes

- Exhibit a hazardous waste property
 - Ignitable – **D001**
 - Corrosive – **D002**
 - Reactive – **D003**
 - Toxic – **D004-D043**
- **I Can Remember That!**

Ignitable

- Waste code = “D001”
- Liquid with Flash Point < 140 deg. F
- Solid capable of causing fire through friction and when ignited burns vigorously and persistently (e.g. Nitrocellulose or some metal fines)
- “Flammable gas” (USDOT)
(e.g. Propane)
- “Oxidizer” (USDOT)
(e.g., Hydrogen Peroxide or Pool Chemicals)

Ignitable



Corrosive

- Waste Code = “D002”
- Aqueous (water based) with a
pH ≤ 2 or ≥ 12.5
- Liquid and corrodes steel at
greater than 0.25”/year

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- **NH02**
 - Corrosive Solid

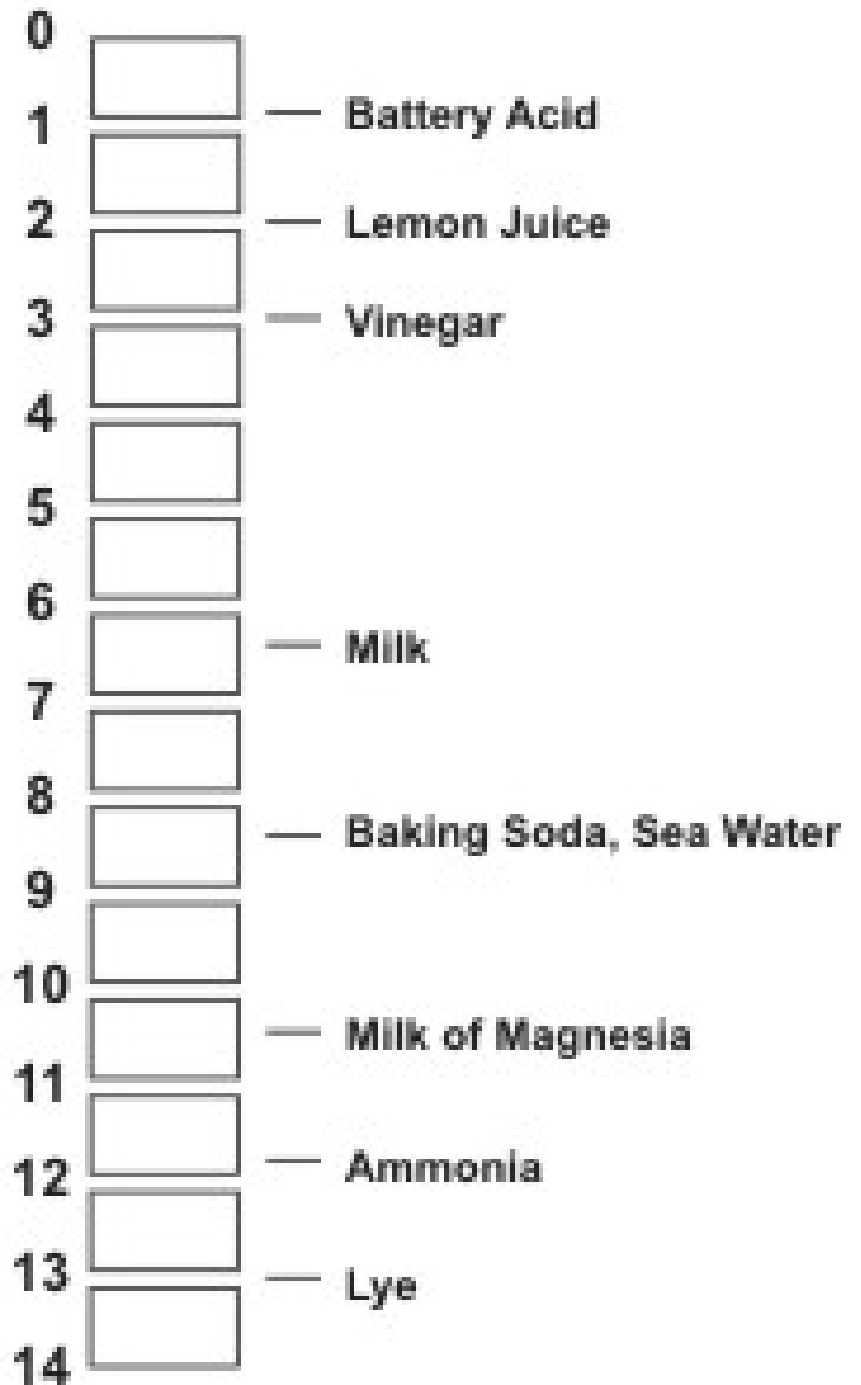
Corrosive



↑
Increasing
Acidity

Neutral

↓
Increasing
Alkalinity



Reactive

- Waste Code = “D003”
- Normally unstable
- Reacts violently with water/air
- Forms potentially explosive mixtures with water/air
- Toxic vapors in contact with water/air
- Cyanide or sulfide bearing waste
- Capable of detonation or explosive reaction
- It is a DOT “Forbidden” Explosive (49 CFR)



Reactive

<http://www.cameochemicals.noaa.gov/>



Toxic

Table 4.9

- Waste codes = “D004” – “D043”
- Requires a lab test called the “Toxicity Characteristic Leaching Procedure” (“TCLP”)
- Simulates leaching activity of landfills
- 8 metals, 6 pesticides, 25 organics



Must be above a minimum concentration to be a toxicity characteristic waste

Toxicity Characteristic

1. Is there any possibility that a chemical in 40 CFR 261.24 Table 1 is in your waste?
 1. What is in the products you use?
 2. What things might be contaminants in your process?
 3. How about trace wear metals in the equipment you use?
2. If there is a possibility that a chemical in Table 1 is in your waste, what is its concentration?

Hazardous Waste Mixtures

- “Waste” or “material” mixed with:
 - **A Listed** waste (P, U, F, K) is a hazardous waste
 - **A Characteristic** waste, and the mixture still exhibits the characteristic is a hazardous waste
- Also,
- Spill residues, soil, water, debris that are mixed with **listed** wastes

Hazardous Waste Determination

- **Responsibility of the Generator!**

Once it is a waste you must decide if it is a hazardous waste



How do I know if my waste is hazardous?

**GENERATOR
KNOWLEDGE**

Some Generator Knowledge of materials and processes is inherent

- Water doesn't burn
- Granite isn't reactive
- Stirring paint doesn't make it more toxic
- Pouring something doesn't make it more corrosive

Some generator knowledge is researched

Gather existing information that enables you to increase generator knowledge

Process Knowledge

What happens to the materials I use?

Material Composition – What's IN this stuff?

MSDS

labels

profiles

manufacturer information, product specs.

previous analyses...

Some generator knowledge has to be acquired through Testing

What you are testing is called a representative sample

There are specific tests to determine if:

1. Your liquid waste is ignitable
2. Your waste is corrosive
3. Your waste has a toxicity characteristic (D004-D043)

There are additional tests to help build or confirm your generator knowledge

Testing - lab analysis ("SW-846")

Documentation

You must do a waste determination on all of your industrial waste streams

You must maintain documents that indicate how you arrived at your conclusion

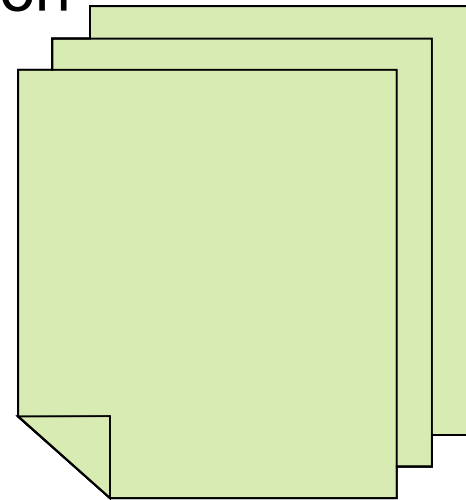
These documents may include:

Waste profiles

Characterization documents

MSDSs

Test Results



You will be asked for waste determination documentation during a hazardous waste inspection

Take credit for your hard work, write it down!

Don't Let Your Waste Determination Get To This

