HAZARDOUS WASTE IDENTIFICATION FUNDAMENTALS

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M-B2

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Annual Training Conference
March 24-27, 2025

Training Topics

1. Hazardous waste laws
2. Is it a waste?
3. Is it a listed hazardous waste?
4. Does it display a characteristic of hazardous waste?
5. Is it excluded or exempted?
6. The mixture and derived-from rules
7. The meaning of Appendix X
8. Self-classification options

Hazardous Waste Laws

Where to find waste classification statutes and regulations:

- Federal
  - _____ (RCRA) – Title 42 U.S. Code, Ch. 82, Subchapter III
- California

Slido Poll #1

In the world of environmental law, what does the acronym “RCRA” stand for?

A. Rubbish Classification and Recycling Act
B. Risky and Contaminating Refuse Amendments
C. Resource Conservation and Recovery Act
D. Really Cool Regulatory Agencies

Hazardous Waste Laws

RCRA §1004(5) defines hazardous waste:

- A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may
  - (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
  - (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous Waste Laws

Where to find waste classification statutes and regulations:

- Federal
  - _____ (RCRA) – Title 42 U.S. Code, Ch. 82, Subchapter III
  - Title 40, Code of Federal Regulations (40 CFR), Parts 260-279, especially Part 261
- California

Table of Contents

Details

Print/PDF

Display Options

Subscribe

Timeline

Go to Date

Compare Dates

ENHANCED CONTENT - TABLE OF CONTENTS

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Site Feedback

Hazardous Waste Laws

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- California
  - Health and Safety Code (HSC), Division 20, Chapter 6.5 - Hazardous Waste Control Law

Code Search | Text Search

Up^ Back To TOC

HEALTH AND SAFETY CODE - HSC

DIVISION 20. MISCELLANEOUS HEALTH AND SAFETY PROVISIONS [24000 - 26275] *(Division 20 enacted by Stats. 1939, Ch. 60.)*

CHAPTER 6.5. Hazardous Waste Control [25100 - 25259] *(Chapter 6.5 added by Stats. 1972, Ch. 1236.)*

ARTICLE 4. Listings [25140 - 25145.4] *(Article 4 added by Stats. 1972, Ch. 1236.)*

25141. (a) The department shall develop and adopt by regulation criteria and guidelines for the identification of hazardous wastes and extremely hazardous wastes.

(b) The criteria and guidelines adopted by the department pursuant to subdivision (a) shall identify as hazardous waste or combinations of waste that, because of the quantity, concentration, or physical, chemical, or infectious characteristics of the waste, may do either of the following:

(1) Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.

(2) Pose a substantial present or potential hazard to human health or the environment, due to factors including,

Hazardous Waste Laws

Where to find waste classification statutes and regulations:

- Federal
  - Resource Conservation and Recovery Act (RCRA) – Title 42 U.S. Code, Ch. 82, Subchapter III
  - Title 40, Code of Federal Regulations (40 CFR), Parts 260-279, especially Part 261
- California
  - Health and Safety Code (HSC), Division 20, Chapter 6.5 - Hazardous Waste Control Law
  - California Code of Regulations, Title 22, Division 4.5 (22 CCR) – especially Chapter 11

Chapter 11. Identification and Listing of Hazardous Waste

Hazardous Waste Laws

Where to find waste classification statutes and regulations:

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- California
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  - California Code of Regulations, Title 22, Division 4.5 (22 CCR) – especially Chapter 11

Hazardous Waste Laws

California has been a leader in hazardous waste regulation

Department of Toxic Substances Control

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

California's Hazardous Waste Control Law in 1972; regulations by 1973

RCRA passed in 1976; regulations adopted beginning in 1980

California's requirements are "more stringent" and "broader in scope" than the federal hazardous waste rules.

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Hazardous Waste Laws

RCRA / non-RCRA Waste Classification

- "RCRA hazardous wastes"
  - Hazardous waste according to 40 CFR Part 261
  - Would be hazardous waste in any state
- "non-RCRA hazardous wastes"
  - Identified as hazardous waste in California, but not under the federal rules.
  - Informally called "California-only" hazardous wastes

Hazardous Waste Laws

- Generally, California's statutes and regulations contain all hazardous waste requirements that apply in California.
- However, we do have to use "both books" (40 CFR and 22 CCR)

California did not adopt all the federal exclusions/exemptions.

Example: U.S. EPA excludes hazardous secondary materials used to make zinc fertilizers, with certain conditions;

California did not adopt this exclusion.

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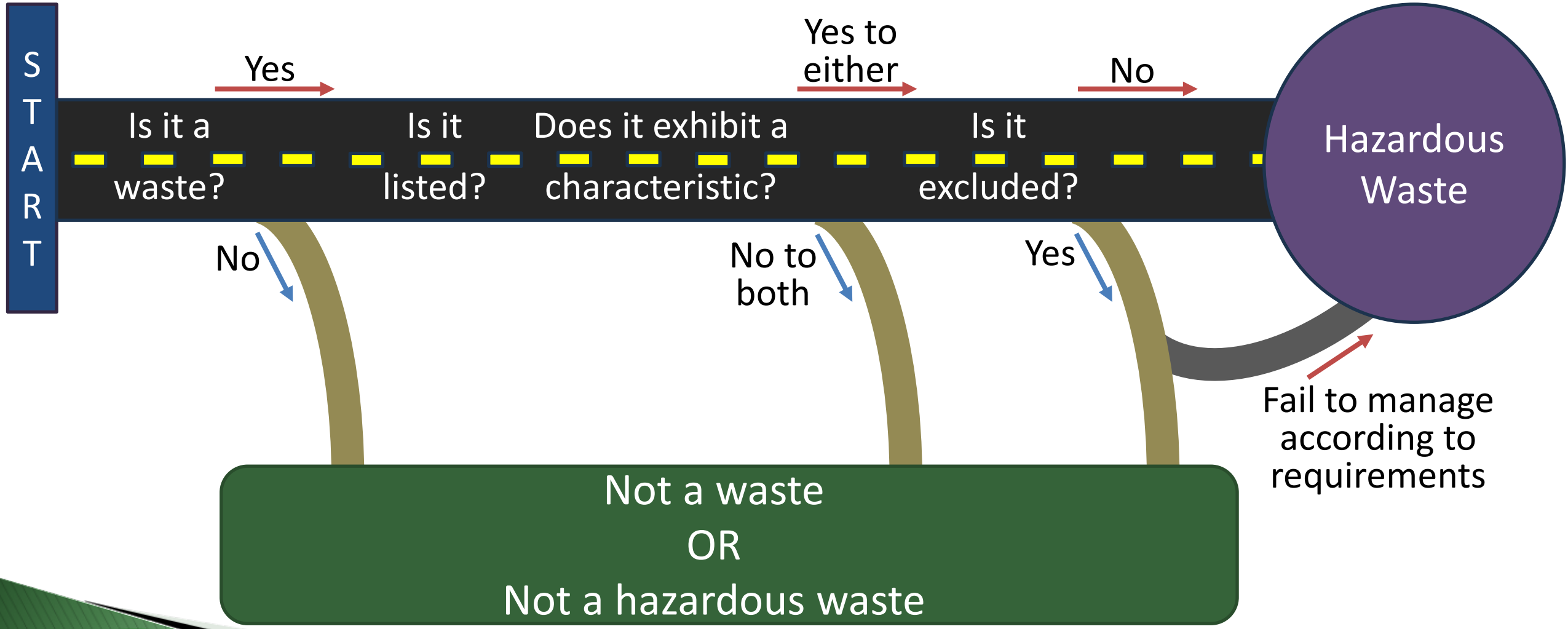
Hazardous Waste Determination Process



Hazardous Waste Determination Process

Step 1	Is it a waste?
Step 2	Listed?
Step 3	Characteristic?
Step 4	Excluded or exempted?

Is it a Waste? – See 22 CCR § 66261.2

Barclays California Code of Regulations
Title 22. Social Security
Division 4.5. Environmental Health Standards for the Management of Hazardous Waste
Chapter 11. Identification and Listing of Hazardous Waste
Article 1. General

22 CCR § 66261.2

§ 66261.2. Definition of Waste.

Currentness

(a) "Waste" means any discarded material of any form (for example, liquid, semi-solid, solid or gaseous) that is not excluded by section 66261.4(a) or section 66261.4(e) or that is not excluded by Health and Safety Code section 25143.2(b) or Health and Safety Code section 25143.2(d).

(b) A discarded material is any material which is any of the following:

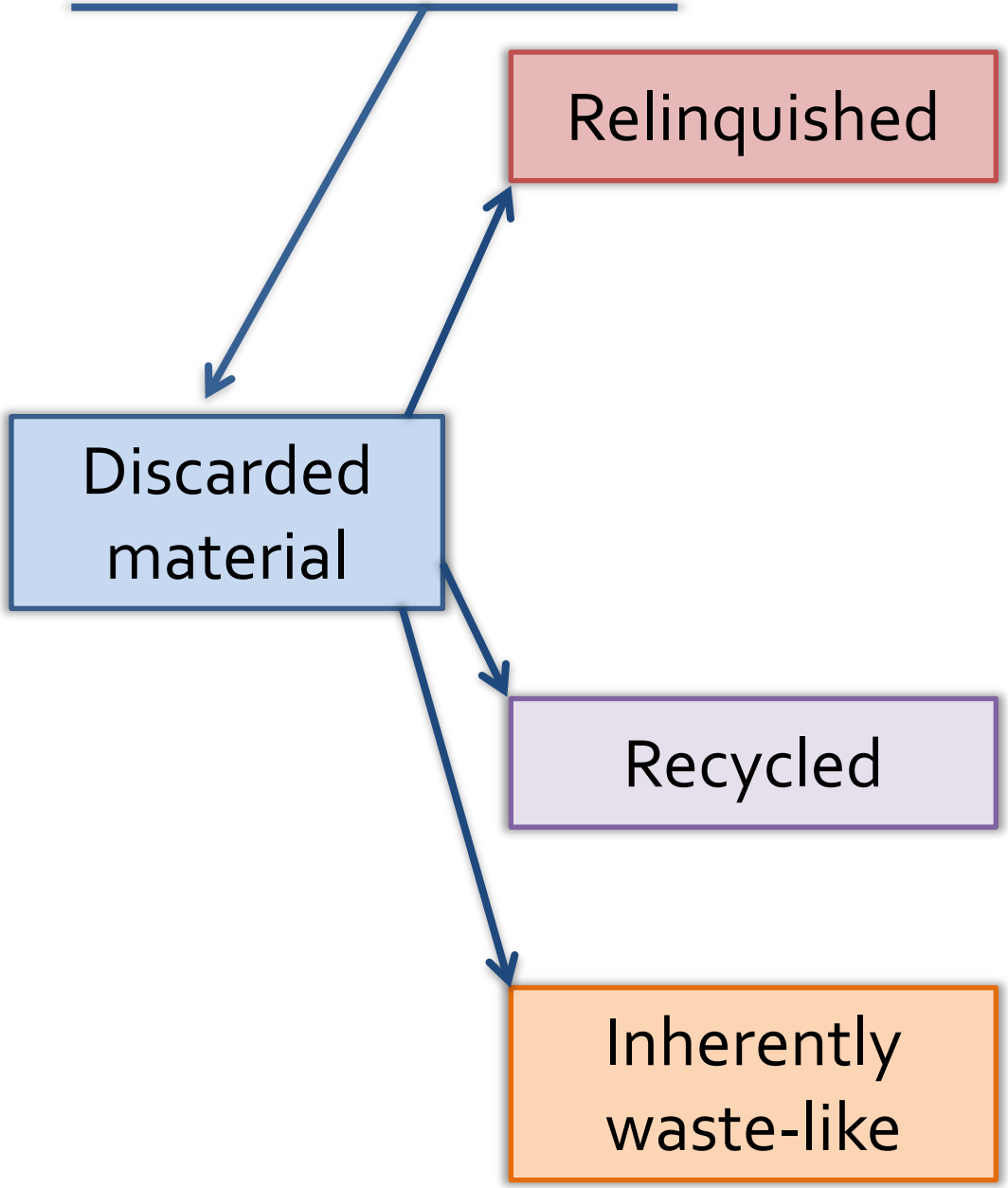
(1) relinquished as explained in subsection (c) of this section; or

(2) recycled, as explained in subsection (d) of this section; or

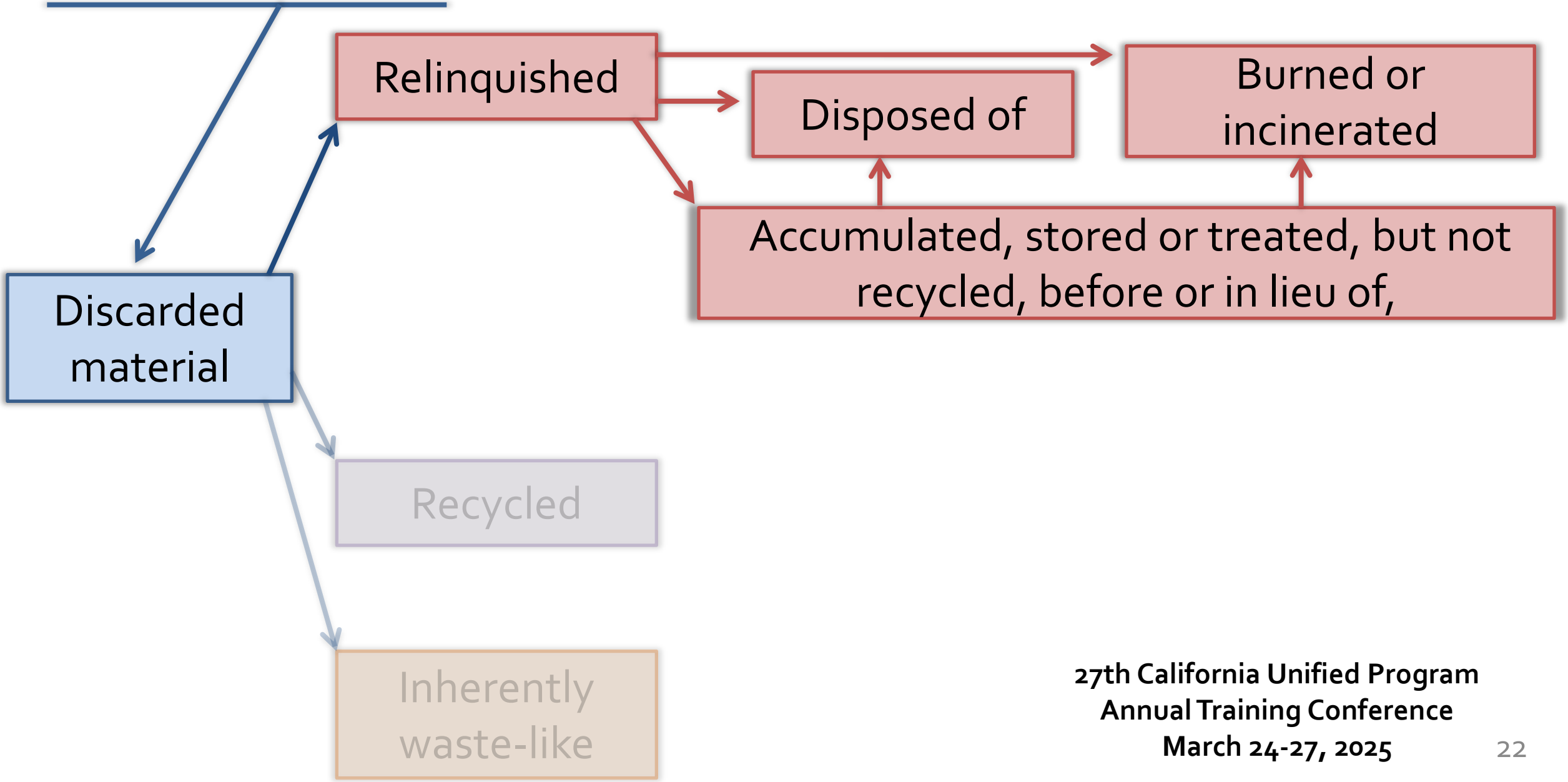
(3) considered inherently waste-like, as explained in paragraph (e) of this section.

(c) A material is a waste if it is relinquished by being any of the following:

Is it a Waste? – See 22 CCR § 66261.2



Is it a Waste? – See 22 CCR § 66261.2



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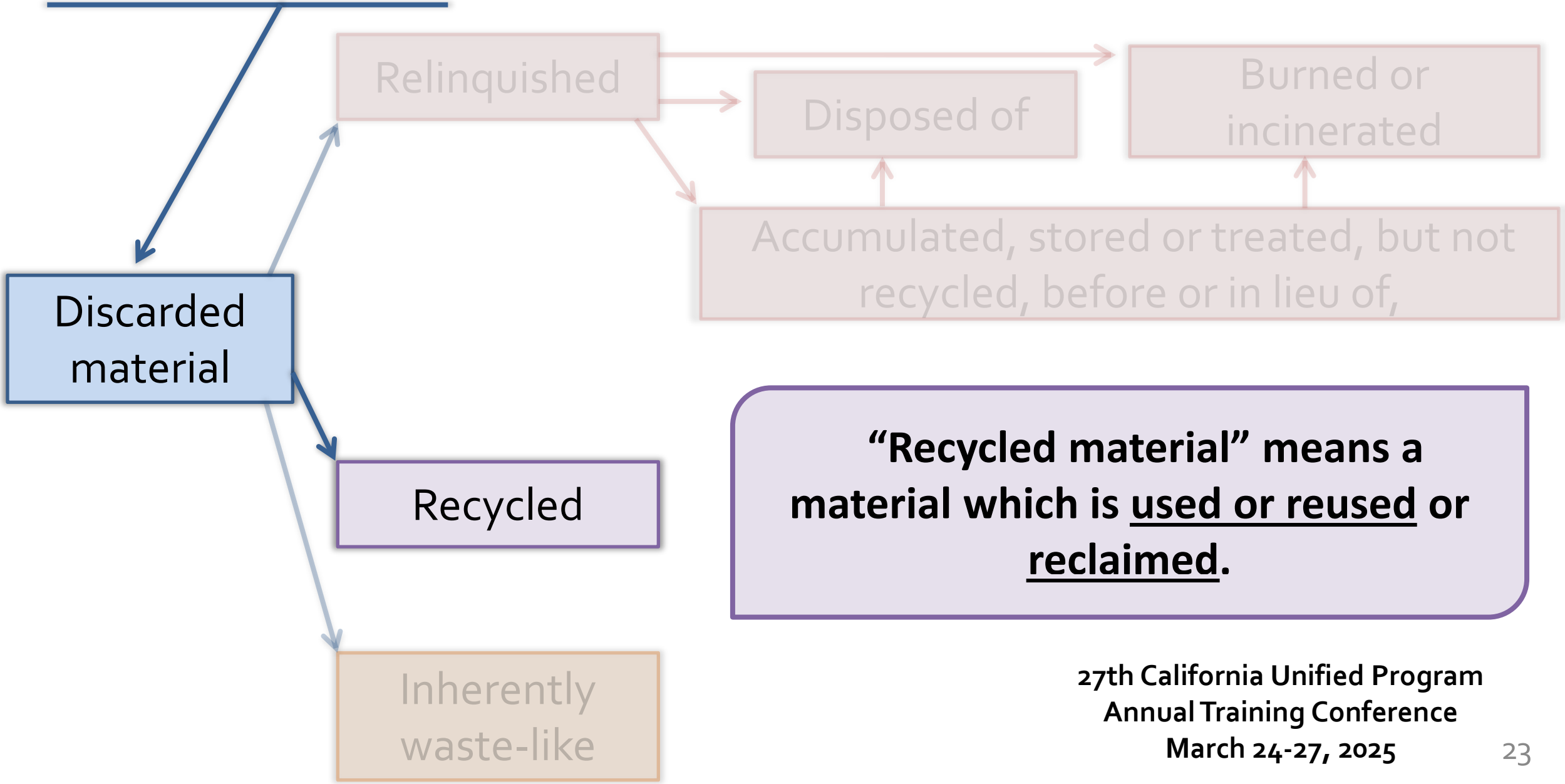


"Recycled material" means a material which is used or reused or reclaimed.

Slido Poll #2

Which kind of recycling would it be if the hypothetical spent lubricant was treated to add back some of its volatile chemicals, so that it could be put back into service in the machine it was designed for?

A. Use
B. Reuse
C. Recovery (one kind of reclamation)
D. Regeneration (the other kind of reclamation)

Slido Poll #3

Which kind of recycling would it be if the hypothetical spent lubricant was removed from its machine, and then utilized as a degreaser for machines around the factory?

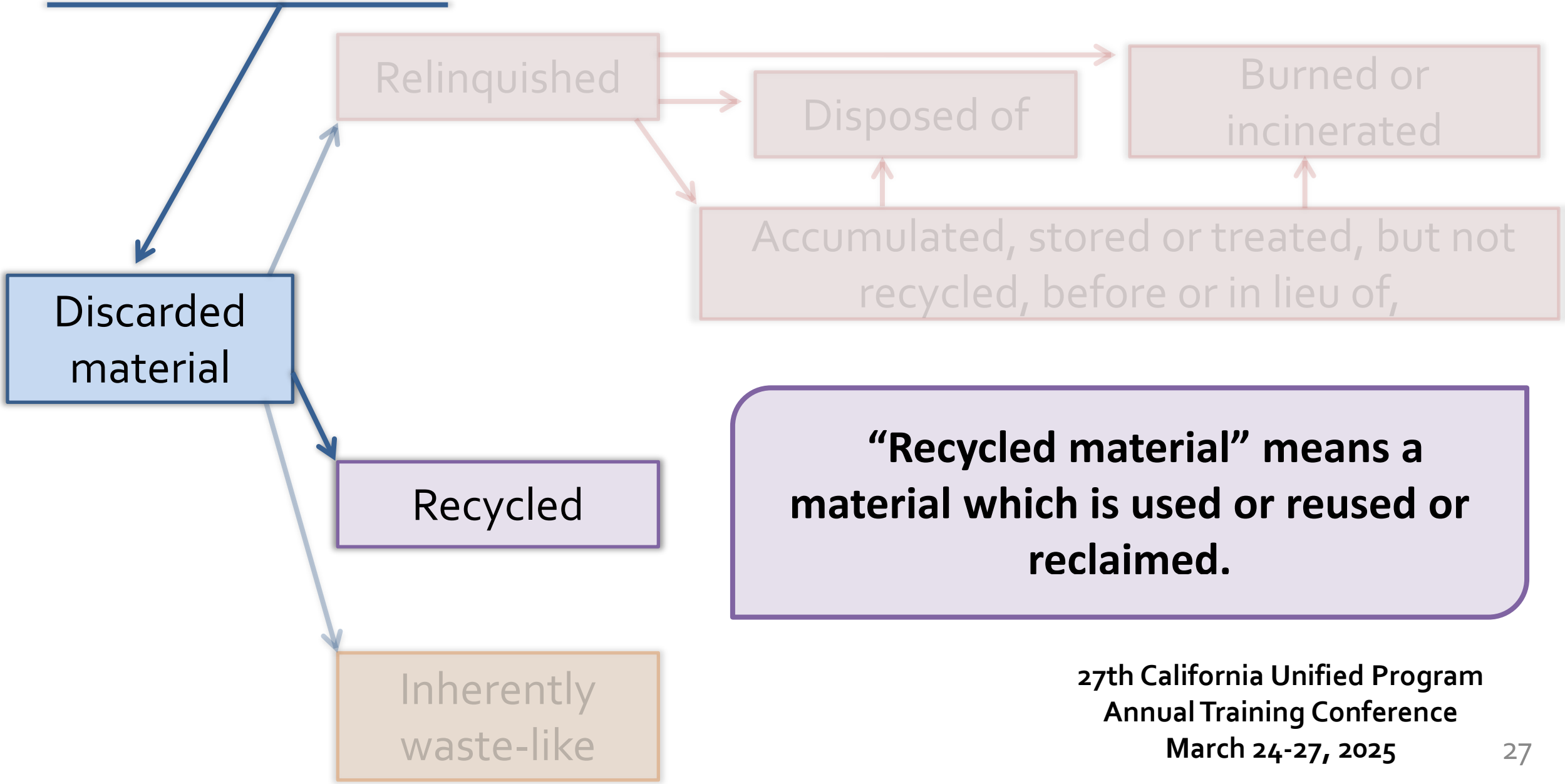
A. Use
B. Reuse
C. Recovery (one kind of reclamation)
D. Regeneration (the other kind of reclamation)

Slido Poll #4

Which kind of recycling would it be if the hypothetical spent lubricant was sent away to be distilled/separated into its component chemicals, which could then be sold by the recycler?

A. Use
B. Reuse
C. Recovery (one kind of reclamation)
D. Regeneration (the other kind of reclamation)

Is it a Waste? – See 22 CCR § 66261.2

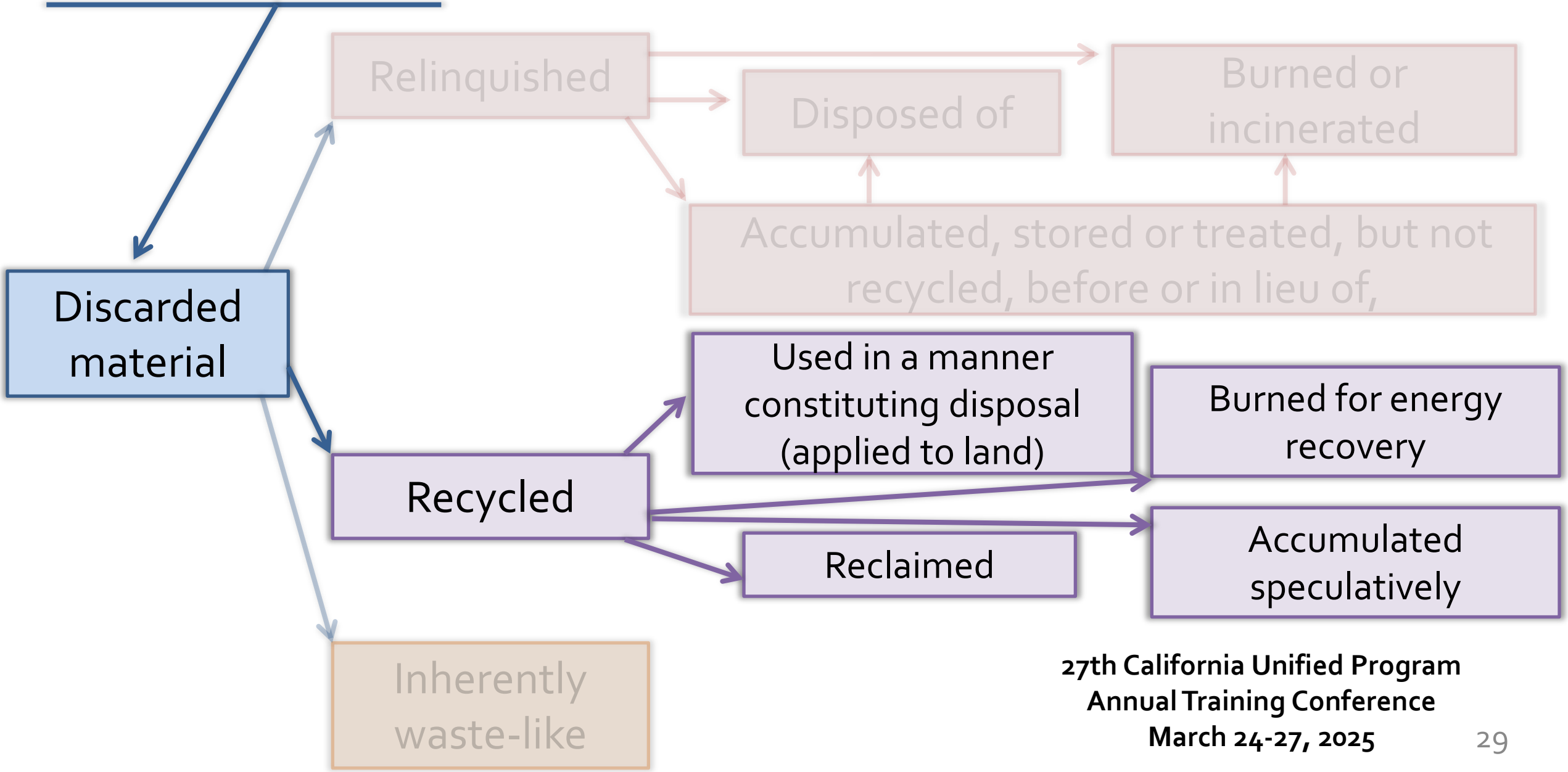


"Recycled material" means a material which is used or reused or reclaimed.

Table 1 of 22 CCR section 66261.2(d)

Column	**Use Constituting Disposal** 66261.2(d)(1)	**Energy Recovery / Fuel** 66261.2(d)(2)	**Reclamation** 66261.2(d)(3)	**Speculative Accumulation** 66261.2(d)(4)
Spent Materials	*	*	*	*
Sludges (listed in section 66261.31 or 66261.32)	*	*	*	*
Sludges exhibiting a characteristic of hazardous waste	*	*	**	*
By-products (listed in section 66261.31 or 66261.32)	*	*	*	*
By-products exhibiting a characteristic of hazardous waste	*	*	**	*
Commercial chemical products (listed in section 66261.33)	*	*	**	**

Is it a Waste? – See 22 CCR § 66261.2



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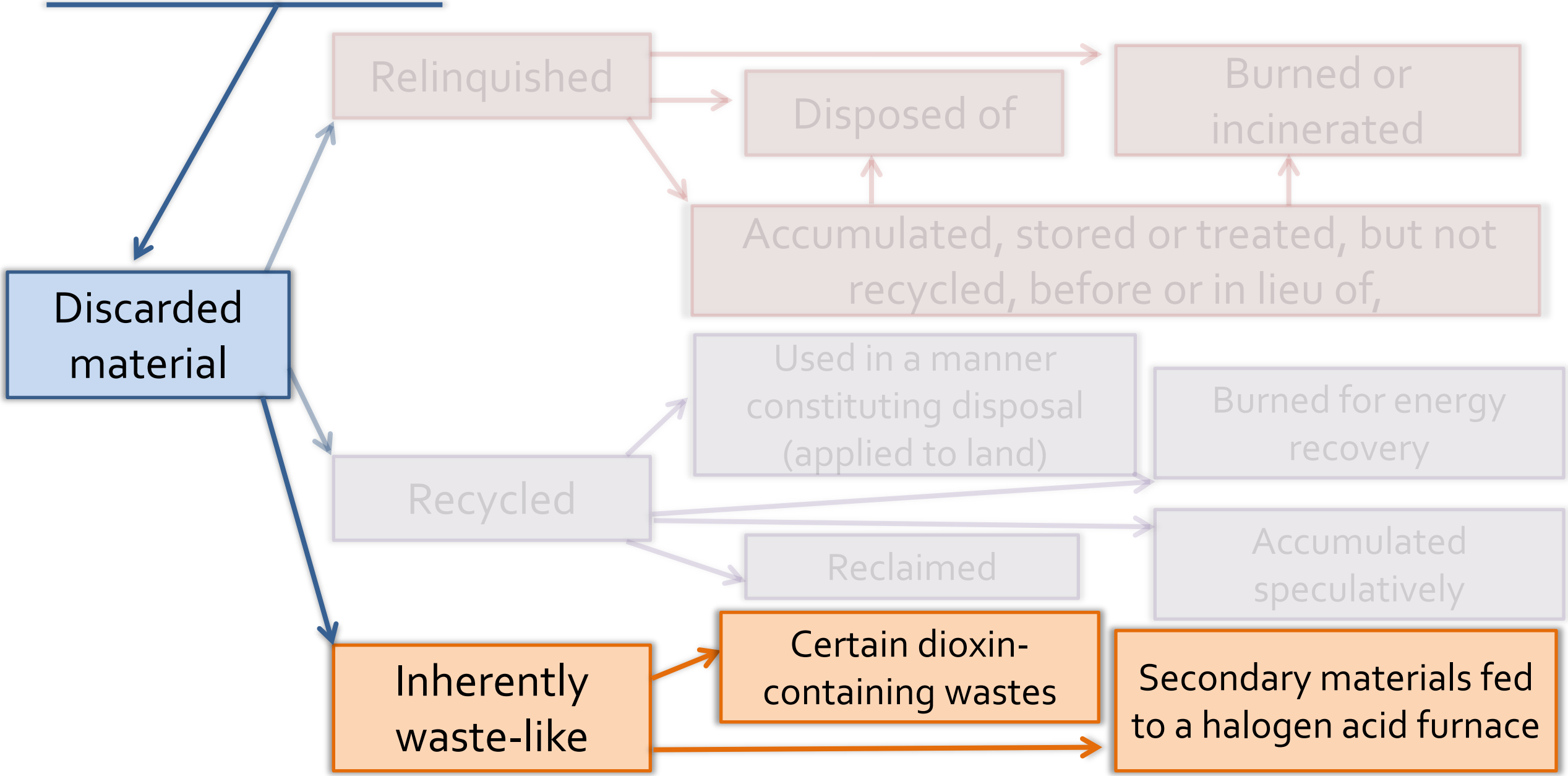

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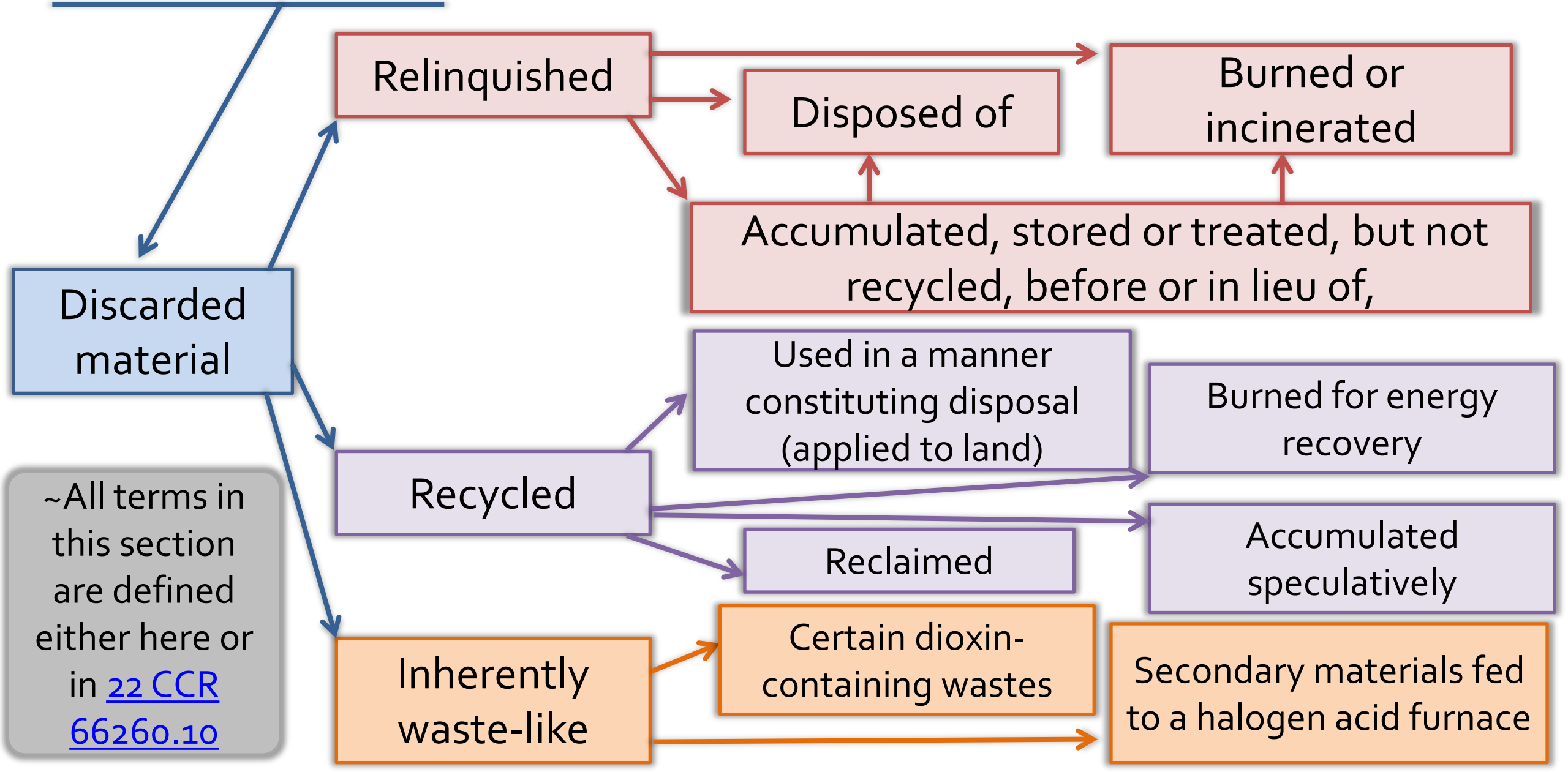


Is it a Waste? – See 22 CCR § 66261.2

Discarded material

Problematically stored hazardous materials:

- Mislabeled or inadequately labeled, or
- Packaged in deteriorated/damaged containers.

Become wastes if they pose a threat to human health or the environment, and if the problem is not fixed within specified time limits.

Hazardous Waste Determination Process

Step 1	Is it a waste?
Step 2	Listed?
Step 3	Characteristic?
Step 4	Excluded or exempted?

22 CCR Chapter 11, Article 4: RCRA Lists

- Lists were created based on U.S. EPA criteria (40 CFR §261.11)
- **The source of the waste (i.e., the process that generated the waste) is as important as the concentrations of the waste constituents**
- Must meet all aspects of the listing for it to apply

Slido Poll #5

What are the 5 listed waste letter designations in California:

A. F, K, P, U, appendix X

B. F, K, P, U, M

C. F, K, P, U, D

D. C, U, P, A, S

Listed Wastes

- Four RCRA lists
  - F, K, P, U
- One California List
  - M-List, mercury-containing wastes
- The presumptive list (Appendix X)
  - are not “listed” wastes

RCRA Lists

- Non-specific sources (F-listed)
- Specific sources (K-listed)
- Discarded commercial chemical products, off-specification species, and spill residues (P- and U-listed)

Non-Specific Sources (F-listed)
22 CCR §66261.31

- Waste codes with “F” followed by a three-digit number (F001-F039)
- Not solely dependent on industry or process that generates the waste
- Not dependent on constituents or their concentrations present in the waste
- May be excluded pursuant to 40 CFR 260.20 and 260.22

F-listed Waste Groupings

- Spent solvents (F001 - F005)
- Metal plating wastes (F006 - F012, and F019)
- Dioxin-bearing wastes (F020 - F023 and F026 - F028)
- Wastes from production of certain chlorinated aliphatic hydrocarbons (F024 and F025)
- Wood preserving wastes (F032, F034, and F035)
- Petroleum refinery wastewater treatment sludges (F037 and F038)
- Multisource leachate (F039)

F007 Example

Spent cyanide plating bath solutions from electroplating operations.

F003 Example

An unused degreasing solvent consisting of 55% xylene, 25% acetone, and 20% methanol is found at an automotive repair shop. Is the solvent an F-listed waste?

Specific Sources (K-listed)
22 CCR §66261.32

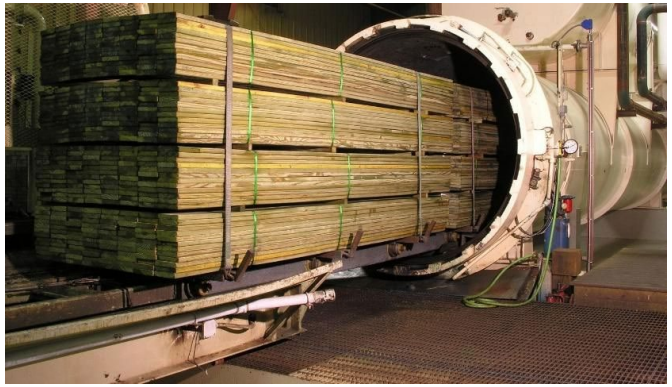
- Waste codes with “K” followed by a three-digit number (ex: K001 or K175)
- Dependent on industry or process that generates the waste
- Not dependent on constituents or their concentrations present in the waste

K-listed Waste Groupings

- wood preservation (K001)
- inorganic pigment manufacturing (K002 - K008)
- organic chemicals manufacturing (K009 - K011, K013-K030, K083, K085, K093-K096, K103-K105, K107-K118, K136, K149-K151, K156-K159, K161, K174-K175, and K181)
- inorganic chemicals manufacturing (K071, K073, K106, and K176-K178)
- pesticides manufacturing (K031-K043, K097 - K099, K123-K126, and K131-K132)
- explosives manufacturing (K044-K047)
- petroleum refining (K048-K052, & K169 - K172)
- iron and steel production (K061 & K062)
- primary aluminum production (K088)
- secondary lead processing (K069 and K100)
- veterinary pharmaceuticals manufacturing (K084 and K101-K102)
- ink formulation (K086)
- coking (K060, K141-K145, & K147- K148)

K001 Example

- "Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol."



- <u>To be Listed:</u>
  - Wood preserving facility
  - Facility must use creosote or pentachlorophenol
  - Facility must generate and treat wastewater
  - Only bottom sediment sludge from a wastewater treatment unit

P- and U-Listed Wastes
22 CCR §66261.33(e) & (f)

Discarded Commercial Chemical Products, Off-Spec. Species, Container Residues, and Spill Residues

- Waste codes with “P” or “U” with a three-digit number (P001, U001)
- “P” listings are acutely hazardous (H)
- “U” listings contain toxic constituents (T)
- The presence of a P or U listed chemical alone does not trigger the listing.

P- and U-Listed Wastes
22 CCR §66261.33(e) & (f)

To be listed:

- Discarded or intended to be discarded
- Must be **unused and not spent**
  - If it has been used for its intended purpose it is not listed
- Must be pure
  - **Sole active ingredient** in a formulation
- Must not have been mixed with other chemicals to form a product

P- and U-Listed Wastes

- Examples of wastes: laboratory chemicals, expired or shelf-life materials, raw material spills
- Common P-listed examples: benzyl chloride (P028), hydrogen cyanide (P063), nicotine (P075), warfarin (P001)
- Common U-listed examples: acetone (U002), ACN (U003), benzene (U019), toluene (U220)

Scenario : Nicotine (P075)

A nicotine vape pen is discarded in a public trash can due to a dead battery. The nicotine cartridge is still ¾ full.

Is the vape pen or cartridge a P-listed waste?

Scenario : P-Listed Waste Mixture

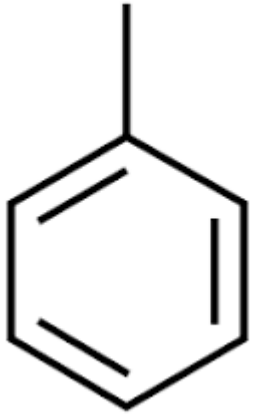
An unused pesticide containing 50% heptachlor (a P059 listed waste) and 50% toxaphene (a P123 listed waste) is to be discarded.

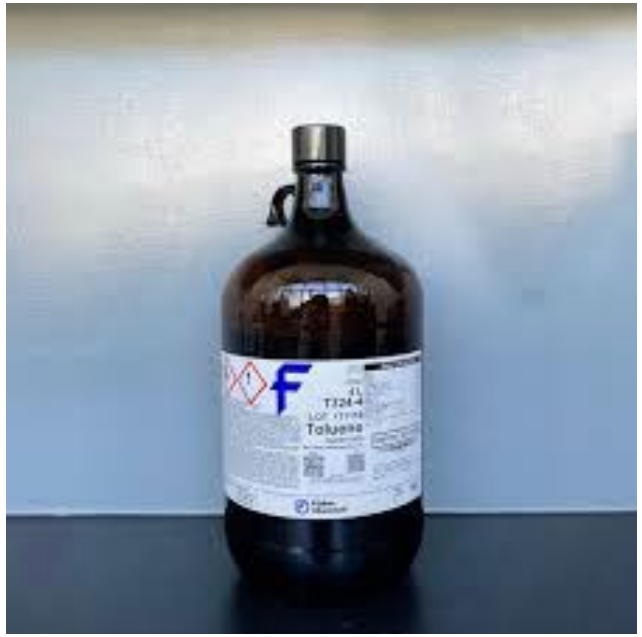
Is the pesticide a P-listed waste?

Scenario : Toluene (U220)

A paint formulation containing toluene is discarded. Toluene helps the paint spread evenly.

Is the paint a U-listed waste?

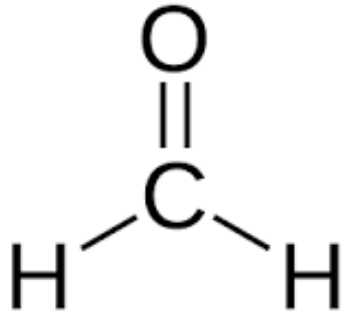




Scenario : Formaldehyde (U122)

Unused embalming fluid that contains formaldehyde and some colorants and perfumes is to be discarded.

Is the discarded, unused embalming fluid a U-listed waste?



Slido Poll #6

P and U Listed Wastes must be:

A. Used or spent, and components of a mixture

B. Unused and not spent, and components of a mixture

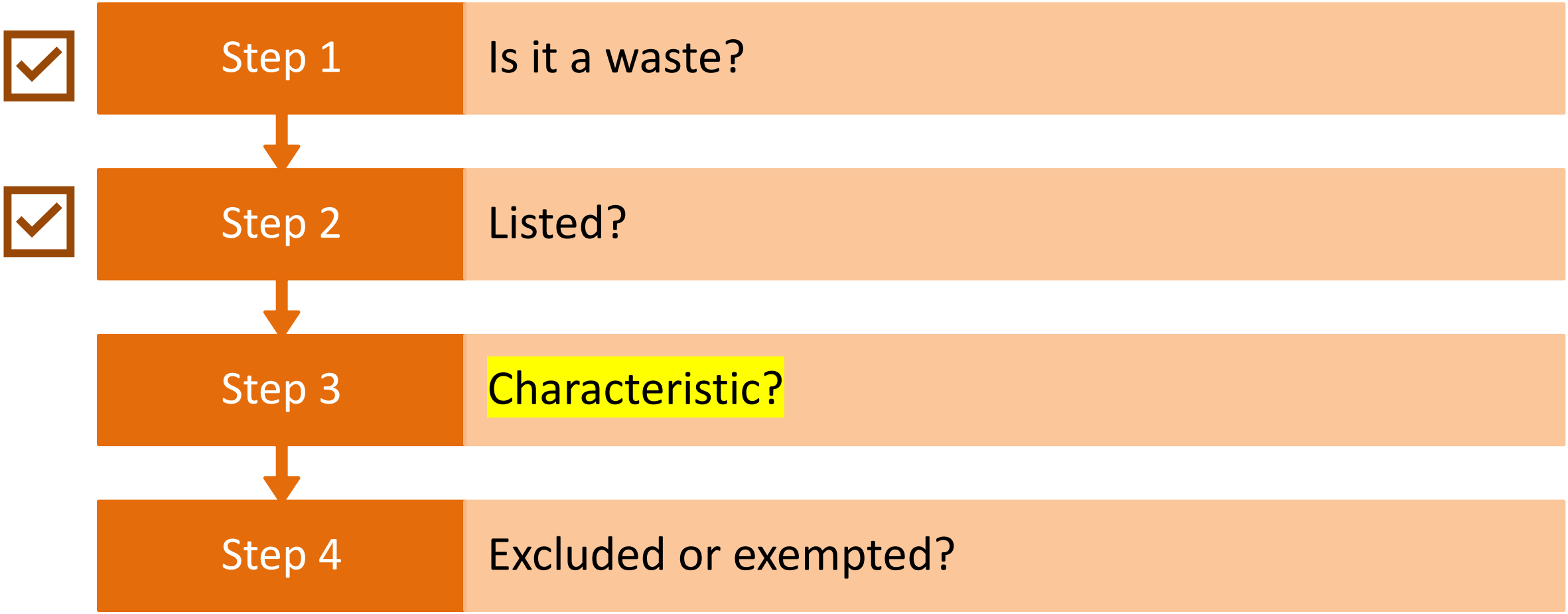
C. Unused and not spent, sole active ingredient

D. Used or spent, sole active ingredient

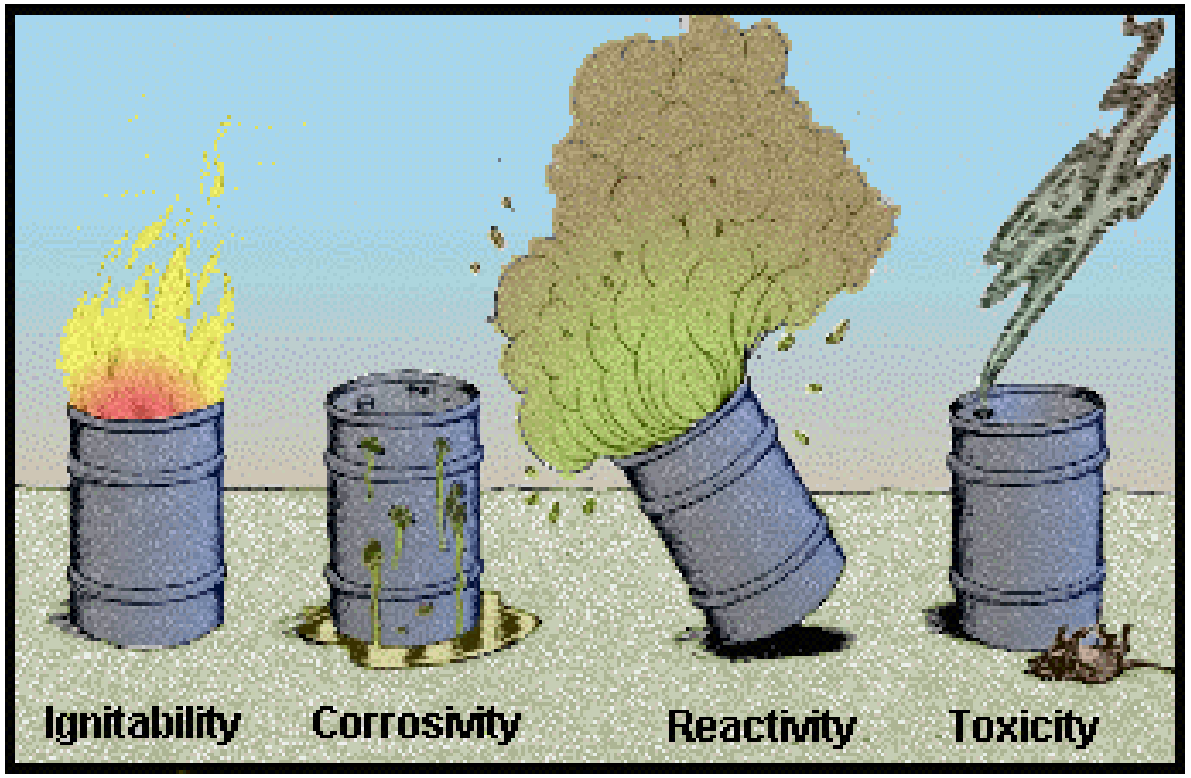
Article 4.1 – California List M-listed Waste

- Mercury-containing wastes, “M” letter plus 3 digits.
  - M001: Mercury light switches in cars and cars with them prior to crushing, baling, shredding
  - M002: Other mercury switches in products, including appliances
  - M003: Mercury-containing lamps and products with mercury lamps
  - M004: Mercury-added novelties

Hazardous Waste Determination Process



Characteristics of Hazardous Waste



1. Characteristic of Ignitability (22 CCR § 66261.21)
2. Characteristic of Corrosivity (22 CCR § 66261.22)
3. Characteristic of Reactivity (22 CCR § 66261.23)
4. Characteristic of Toxicity (22 CCR § 66261.24)

Slido Poll #7

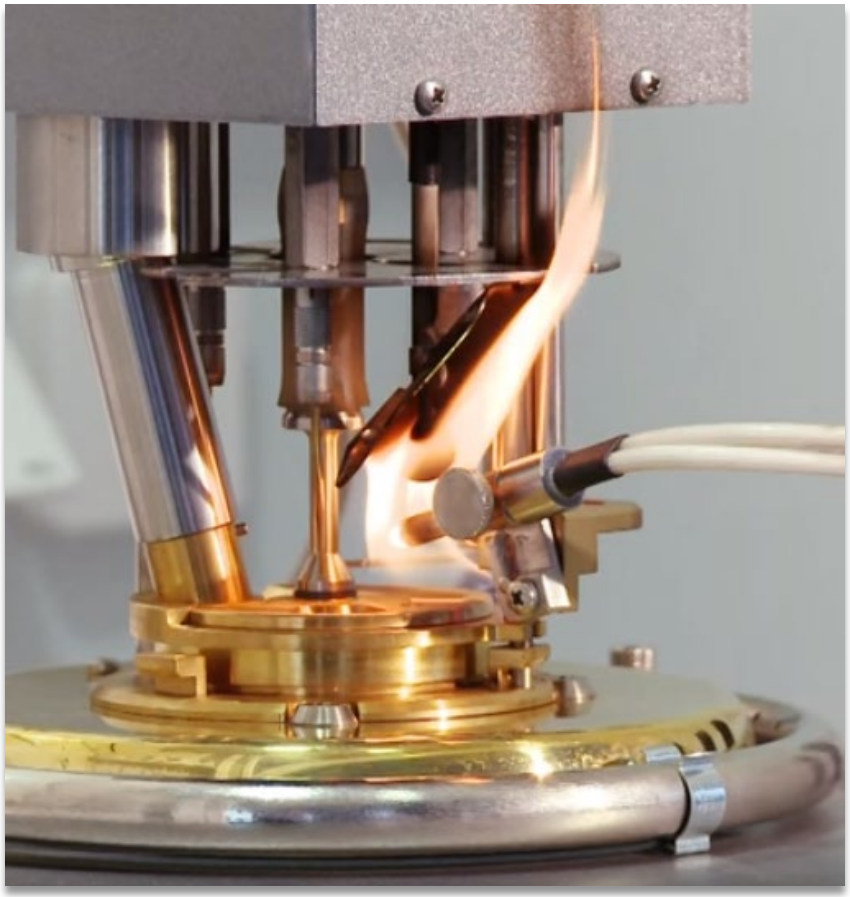
Name a kind of material that you know or expect would qualify as ignitable when it becomes a waste.

Characteristics of Hazardous Waste

Ignitable Hazardous Waste (D001)

- Liquids with flash point less than 140⁰ F (other than aqueous solutions containing less than 24% alcohol by volume)

Flash point is the lowest temperature at which a liquid will form sufficient vapors to generate a combustible mixture with the air at its surface.



Characteristics of Hazardous Waste

Ignitable Hazardous Waste (D001)

- Liquids with flash point less than 140⁰ F (other than aqueous solutions containing less than 24% alcohol by volume)
- Not a liquid and is capable, under STP, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard (example: magnesium metal)

Fruitland Magnesium Fire, Maywood, CA, 2016

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Characteristics of Hazardous Waste

Ignitable Hazardous Waste (D001)

- Liquids with flash point less than 140⁰ F (other than aqueous solutions containing less than 24% alcohol by volume)
- Not a liquid and is capable, under STP, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard (example: magnesium metal)
- Ignitable compressed gasses
  - Flammable mixture with air at 13% or less (by volume)
  - Flammable range > 12% in air
- Oxidizers (examples: permanganate, peroxides)

Characteristics of Hazardous Waste

Corrosive Hazardous Waste

Federal (D002)	California
▪ Aqueous waste with pH ≤ 2 or with pH ≥ 12.5 ▪ Liquid that corrodes steel 	▪ Aqueous waste with pH ≤ 2 or with pH ≥ 12.5 ▪ Liquid that corrodes steel ▪ **Not aqueous and produces a solution with pH ≤ 2 or with pH ≥ 12.5** ▪ **Not liquid and produces a solution that corrodes steel**

California (not U.S. EPA) regulates corrosive solids. These are non-RCRA hazardous waste).

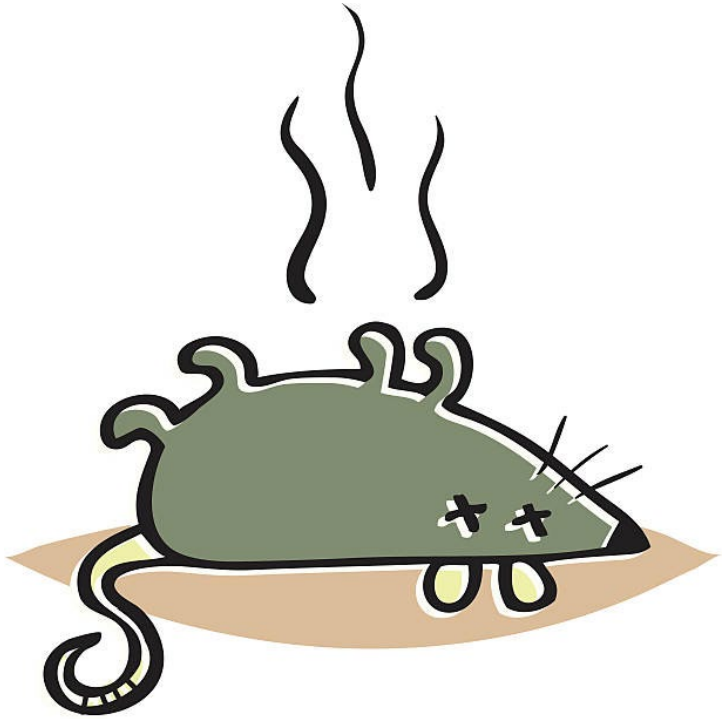
Characteristics of Hazardous Waste

Reactive Hazardous Waste (D003)

- Narrative description in 22 CCR § 66261.23 includes things that:
  - Explode / detonate;
  - React violently with water, or give off toxic or explosive gases when mixed with water;
  - Certain DOT-defined explosive categories.
- In most cases, there are no test methods.
- HSC § 25141.5(b)(1) – DTSC must use U.S. EPA's guidance.

Characteristics of Hazardous Waste

Toxic Hazardous Wastes



- Characteristic of Toxicity (22 CCR § 66261.24)
- Eight criteria for the Toxicity Characteristic:
  - Two leaching tests (TCLP and WET),
  - Total digestion test,
  - Four different direct acute toxicity (lethality to animals) tests,
  - A list of carcinogens, and
  - A "catch all" criterion.
- Toxic if satisfies any one of the elements

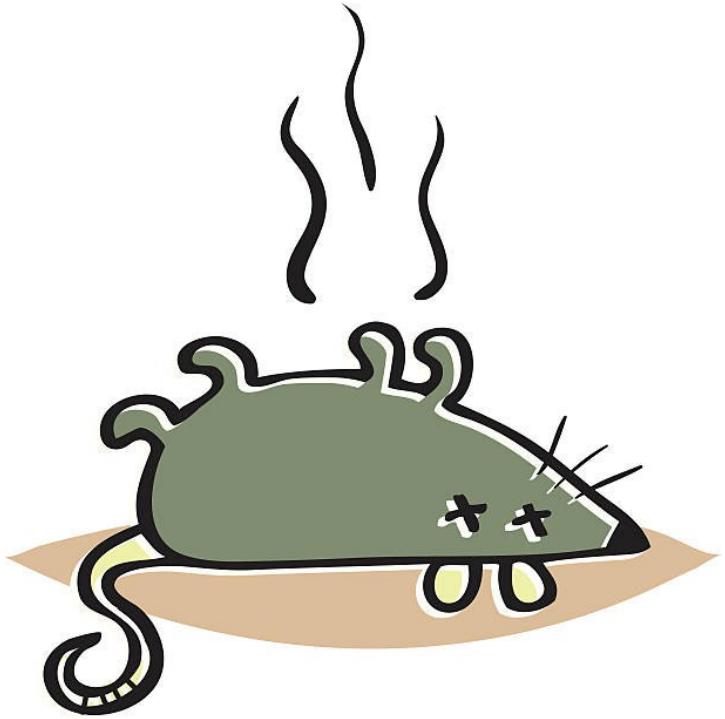
Characteristics of Hazardous Waste

Toxic Hazardous Wastes

RCRA	Non-RCRA
Toxic (D004-D043) - TCLP	Toxic (California Waste Code…) - STLC (WET) - TTLC - Oral LD_{50} < 2500 mg/kg - Dermal LD_{50} < 4300 mg/kg - Inhalation LC_{50} < 10,000 ppm - Aquatic 96hr LC_{50} < 500 mg/l - Carcinogen Concentration ≥ 10 ppm (0.001% by weight)

Characteristics of Hazardous Waste

Toxic Hazardous Wastes



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  - A list of carcinogens, and
  - A "catch all" criterion.
- Toxic if satisfies any one of the elements

Characteristics of Hazardous Waste

Federal Toxicity Characteristic 66261.24(a)(1)

- TCLP (Toxicity Characteristic Leaching Procedure)
  - Designed to predict how toxic constituents would leach from waste if disposed in a municipal solid waste landfill.

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Characteristics of Hazardous Waste

Federal Toxicity Characteristic 66261.24(a)(1)

- TCLP (Toxicity Characteristic Leaching Procedure)
  - Designed to predict how toxic constituents would leach from waste if disposed in a municipal solid waste landfill.
- TCLP extract is analyzed for concentrations of toxic chemicals
  - Eight metals
  - Four pesticides
  - Two herbicides
  - Twenty-six other organic compounds
- Waste is toxic (_____ hazardous waste) if any level equals or exceeds its threshold

U.S. EPA Number	Contaminant	Regulatory Level mg/L
D004	Arsenic	5.0
D005	Barium	100
D018	Benzene	0.5
D006	Cadmium	1.0
D019	Carbon tetrachloride	0.5
D020	Chlordane	0.03
D021	Chlorobenzene	100.0
D022	Chloroform	6.0
D007	Chromium	5.0
D023	o-Cresol	200.0 [1]
D024	m-Cresol	200.0 [1]
D025	p-Cresol	200.0 [1]
D026	Cresol	200.0 [1]
D016	2,4-D	10.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D030	2,4-Dinitrotoluene	0.13
D012	Endrin	0.02
D031	Heptachlor (and its epoxide)	0.008

U.S. EPA Number	Contaminant	Regulatory Level mg/L
D032	Hexachlorobenzene	0.13
D033	Hexachlorobutadiene	0.5
D034	Hexachloroethane	3.0
D008	Lead	5.0
D013	Lindane	0.4
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035	Methyl ethyl ketone	200.0
D036	Nitrobenzene	2.0
D037	Pentachlorophenol	100.0
D038	Pyridine	5.0 [2]
D010	Selenium	1.0
D011	Silver	5.0
D039	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040	Trichloroethylene	0.5
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (Silvex)	1.0
D043	Vinyl chloride	0.2

Characteristics of Hazardous Waste

Federal Toxicity Characteristic 66261.24(a)(1)

- TCLP (Toxicity Characteristic Leaching Procedure)
  - Designed to predict how toxic constituents would leach from waste if disposed in a municipal solid waste landfill.
- TCLP extract is analyzed for concentrations of toxic chemicals
  - Eight metals
  - Four pesticides
  - Two herbicides
  - Twenty-six other organic compounds
- Waste is toxic (_____ hazardous waste) if any level equals or exceeds its threshold
- The TCLP is not applied to RCRA-excluded or exempted wastes.

  Example – Petroleum-contaminated soil from UST cleanup is not subject to TCLP for benzene.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Persistent and Bioaccumulative Toxic Substances 22 CCR § 66261.24(a)(2)(A) & (B)

- 19 inorganic chemicals (mostly metals)
- 18 organic chemicals

66261.24(a)(2)(A)

WET inorganics (metals)

Substance [a,b] (= California-only analyte)
Antimony and/or antimony compounds
Arsenic and/or arsenic compounds
Asbestos
Barium and/or barium compounds (excluding barite)
Beryllium and/or beryllium compounds
Cadmium and/or cadmium compounds
Chromium (VI) compounds
Chromium and/or chromium (III) compounds
Cobalt and/or cobalt compounds
Copper and/or copper compounds
Fluoride salts
Lead and/or lead compounds
Mercury and/or mercury compounds
Molybdenum and/or molybdenum compounds
Nickel and/or nickel compounds
Selenium and/or selenium compounds
Silver and/or silver compounds
Thallium and/or thallium compounds
Vanadium and/or vanadium compounds
Zinc and/or zinc compounds

66261.24(a)(2)(B)

WET organics

Substance [a,b] (= California-only analyte)
Aldrin
Chlordane
DDT, DDE, DDD
2,4-Dichlorophenoxyacetic acid
Dieldrin
Dioxin (2,3,7,8-TCDD)
Endrin
Heptachlor
Kepone
Lead compounds, organic
Lindane
Methoxychlor
Mirex
Pentachlorophenol
Polychlorinated biphenyls (PCBs)
Toxaphene
Trichloroethylene
2,4,5-Trichlorophenoxypropionic acid

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Persistent and Bioaccumulative Toxic Substances 22 CCR § 66261.24(a)(2)(A) & (B)

- 19 inorganic chemicals (mostly metals)
- 18 organic chemicals

- Two kinds of tests:
  - A leaching test – the Waste Extraction Test (WET), similar to the TCLP
  - A digestion of the waste, analyzed to reveal the total concentration of each regulated toxic chemical in the waste
- A waste is toxic and hazardous if analytical results equal or exceed thresholds:
  - For the WET extract – Soluble Threshold Limit Concentrations (STLCs).
  - For the total digestion – Total Threshold Limit Concentrations (TTLCs).

66261.24(a)(2)(A) WET inorganics (metals)	STLC	TTLC
Substance [a,b] (= California-only analyte)	**mg/l**	**Wet-Weight mg/kg**
Antimony and/or antimony compounds	15	500
Arsenic and/or arsenic compounds	5.0	500
Asbestos		1.0 (as percent)
Barium and/or barium compounds (excluding barite)	100	10,000 [c]
Beryllium and/or beryllium compounds	0.75	75
Cadmium and/or cadmium compounds	1.0	100
Chromium (VI) compounds	5	500
Chromium and/or chromium (III) compounds	5 [d]	2,500
Cobalt and/or cobalt compounds	80	8,000
Copper and/or copper compounds	25	2,500
Fluoride salts	180	18,000
Lead and/or lead compounds	5.0	1,000
Mercury and/or mercury compounds	0.2	20
Molybdenum and/or molybdenum compounds	350	3,500 [e]
Nickel and/or nickel compounds	20	2,000
Selenium and/or selenium compounds	1.0	100
Silver and/or silver compounds	5	500
Thallium and/or thallium compounds	7.0	700
Vanadium and/or vanadium compounds	24	2,400
Zinc and/or zinc compounds	250	5,000

66261.24(a)(2)(B) WET organics	STLC	TTLC
Substance [a,b] (= California-only analyte)	**mg/l**	**Wet-Weight mg/kg**
Aldrin	0.14	1.4
Chlordane	0.25	2.5
DDT, DDE, DDD	0.1	1.0
2,4-Dichlorophenoxyacetic acid	10	100
Dieldrin	0.8	8.0
Dioxin (2,3,7,8-TCDD)	0.001	0.01
Endrin	0.02	0.2
Heptachlor	0.47	4.7
Kepone	2.1	21
Lead compounds, organic	--	13
Lindane	0.4	4.0
Methoxychlor	10	100
Mirex	2.1	21
Pentachlorophenol	1.7	17
Polychlorinated biphenyls (PCBs)	5.0	50
Toxaphene	0.5	5
Trichloroethylene	204	2,040
2,4,5-Trichlorophenoxypropionic acid	1.0	10

Characteristics of Hazardous Waste

TCLP, WET, and Total Digestion Tips

- For solid material wastes: The total digestion is often done first, because its results can tell you whether the TCLP and WET are necessary.
  - Calculate the maximum concentrations in the two tests' extracts
    - ❑ Find the total concentration of the toxic constituent in the waste.
    - ❑ Divide by 20 for the TCLP.
    - ❑ Divide by 10 for the WET.

Scenario #1: A generator has a solid sludge with a total concentration of lead at 80 mg/kg. The sludge is not listed, and it meets no other characteristic criteria. The generator intends to dispose of the waste.

U.S. EPA Number	Contaminant	Regulatory Level mg/L
D008	Lead	5.0

What is the maximum Pb concentration of the TCLP extract, if 100% of it was soluble?

Where is that in relation to the threshold?

Is it necessary to run the TCLP?

Characteristics of Hazardous Waste

TCLP, WET, and Total Digestion Tips

- For solid material wastes: The total digestion is often done first, because its results can tell you whether the TCLP and WET are necessary.
  - Calculate the maximum concentrations in the two tests' extracts
    - ❑ Find the total concentration of the toxic constituent in the waste.
    - ❑ Divide by 20 for the TCLP.
    - ❑ Divide by 10 for the WET.

Scenario #1: A generator has a solid sludge with a total concentration of lead at 80 mg/kg. The sludge is not listed, and it meets no other characteristic criteria. The generator intends to dispose of the waste.

66261.24(a)(2)(A) WET inorganics (metals)	STLC	TTLC
Substance [a,b] (= California-only analyte)	mg/l	Wet-Weight mg/kg
Lead and/or lead compounds	5.0	1,000

Does the lead concentration exceed the TTLC?

What is the maximum Pb concentration in the WET extract (if 100% is soluble)?

Is this equal to, above, or below the STLC?

Is it necessary to run the WET?

Characteristics of Hazardous Waste

TCLP, WET, and Total Digestion Tips

- For solid material wastes: The total digestion is often done first, because its results can tell you whether the TCLP and WET are necessary.
  - Calculate the maximum concentrations in the two tests' extracts
    - ❑ Find the total concentration of the toxic constituent in the waste.
    - ❑ Divide by 20 for the TCLP.
    - ❑ Divide by 10 for the WET.

Scenario #2: A generator has a solid sludge with a total concentration of lead at 1200 mg/kg. The sludge is not listed, and meets no other characteristic criteria. The generator intends to dispose of the waste.

66261.24(a)(2)(A) WET inorganics (metals)	STLC	TTLC
Substance [a,b] (CA = California-only analyte)	mg/l	Wet-Weight mg/kg
Lead and/or lead compounds	5.0	1,000

What is the maximum Pb concentration in the TCLP extract?

Is it necessary to run the TCLP?

Does the Pb concentration exceed the TTLC?

Is it necessary to run the WET?

Characteristics of Hazardous Waste

TCLP, WET, and Total Digestion Tips

- For solid material wastes, when the contaminant of concern is an organic molecule, it is usually unnecessary to run the WET.
  - For the regulated organic chemicals, the difference between the STLC and the TTLC is the same as the dilution factor for the WET extraction.

66261.24(a)(2)(B) WET organics	STLC	TTLC
Substance [a,b] (= California-only analyte)	mg/l	Wet-Weight mg/kg
Aldrin	0.14	1.4
Chlordane	0.25	2.5
DDT, DDE, DDD	0.1	1.0
2,4-Dichlorophenoxyacetic acid	10	100
Dieldrin	0.8	8.0
Dioxin (2,3,7,8-TCDD)	0.001	0.01

For that reason, if the total concentration of an organic chemical in a solid material waste does not equal or exceed the TTLC, it is not possible for the concentration of that chemical in the WET extract to equal or exceed the STLC.

Characteristics of Hazardous Waste

TCLP, WET, and Total Digestion Tips

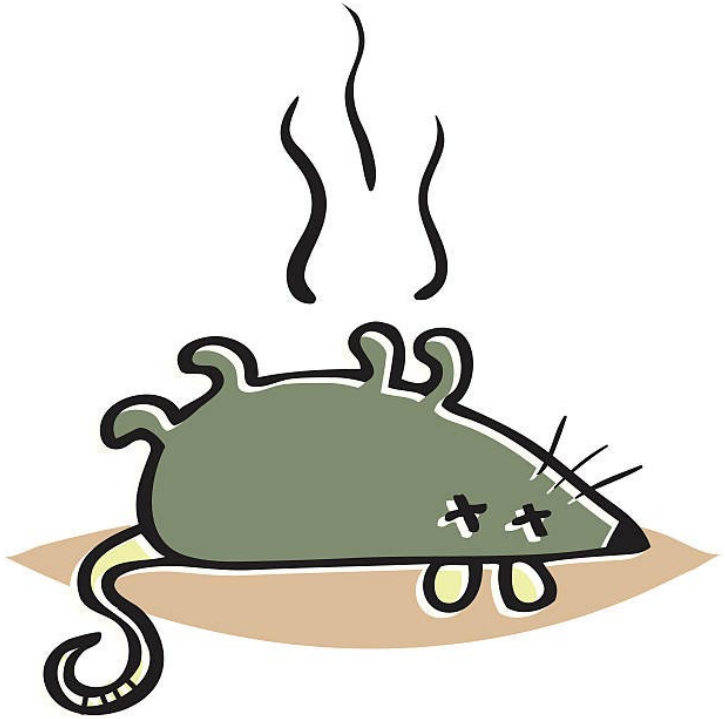
- For liquid wastes (with less than 0.5% solids):
  - Extraction is not performed, for either the TCLP or the WET.

    The waste itself is the extract that is analyzed.
  - Compare the concentrations of toxic chemicals directly to TCLP thresholds and STLCs, respectively.

    TTLCs are irrelevant to these kinds of wastes.
- For multiphasic wastes or others that are not clearly solid or liquid, there is no shortcut: All three tests are necessary.

Characteristics of Hazardous Waste

Toxic Hazardous Wastes



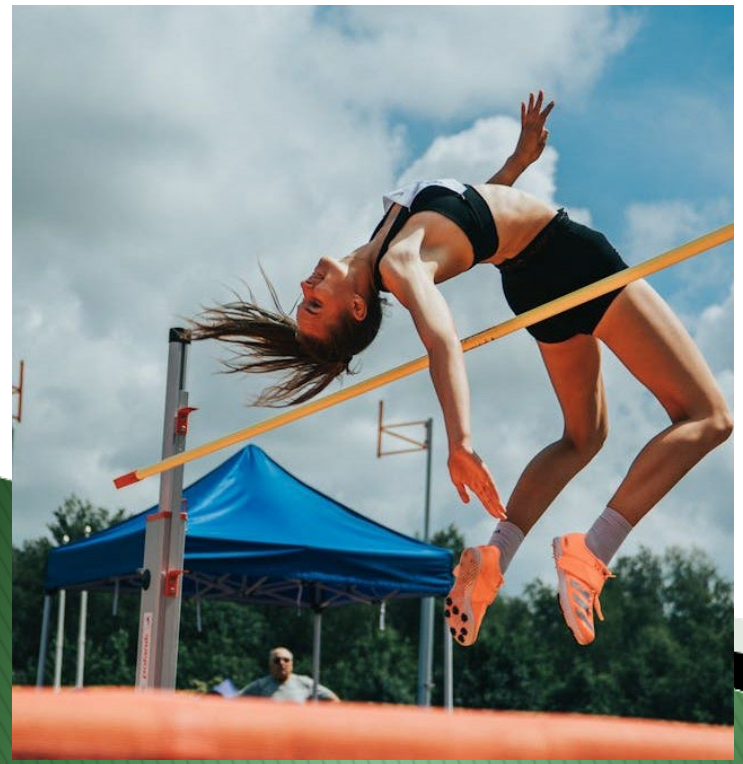
- Characteristic of Toxicity (22 CCR § 66261.24)
- Eight criteria for the Toxicity Characteristic:
  - Two leaching tests (TCLP and WET),
  - Total digestion test,
  - Four different direct acute toxicity (lethality to animals) tests,
  - A list of carcinogens, and
  - A "catch all" criterion.
- Toxic if satisfies any one of the elements

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Oral Toxicity
  - Waste is hazardous if its acute oral $LD_{50} < 2500$ mg/kg



Acute oral LD_{50} is defined in 22 CCR § 66260.10

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Oral Toxicity
  - Waste is hazardous if its acute oral $LD_{50} < 2500$ mg/kg

Section 11: Toxicological Information

11.1 Acute toxicity

Oral – LD_{50} oral (rat): 1750 mg/kg
Inhalation: no data available
Dermal – LD_{50} dermal (rabbit): 4750 mg/kg

11.2 Chronic toxicity

A material, whose partial safety data sheet is shown, becomes a waste.

Is it hazardous waste by the acute oral toxicity criterion?

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Dermal Toxicity 22 CCR § 66261.24(a)(4)
  - Waste is hazardous if its acute dermal LD_{50} < 4300 mg/kg

Acute dermal LD_{50} is defined in 22 CCR § 66260.10.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Dermal Toxicity [22 CCR § 66261.24(a)(4)]
  - Waste is hazardous if its acute dermal LD_{50} < 4300 mg/kg

Section 11: Toxicological Information

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Oral – LD_{50} oral (rat): 1750 mg/kg
Inhalation: no data available
Dermal – LD_{50} dermal (rabbit): 4750 mg/kg

11.2 Chronic toxicity

A material, whose partial safety data sheet is shown, becomes a waste.

Is it hazardous waste by the acute dermal toxicity criterion?

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

  - % A_x is the weight percent of any component in the waste mixture.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

11.1 Acute toxicity

Oral – LD_{50} oral (rat): 1750 mg/kg

- % A_x is the weight percent of any component in the waste mixture.
- TA_x is the acute oral or dermal LD_{50} of the corresponding component.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

11.1 Acute toxicity

Oral – LD_{50} oral (rat): 1750 mg/kg

- % A_x is the weight percent of any component in the waste mixture.
- TA_x is the acute oral or dermal LD_{50} of the corresponding component.
- Σ means to sum all the ratios of % A_x to TA_x.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

What is the calculated oral LD_{50} of a waste, if this is its composition:

Chemical	Acute oral LD_{50}	Weight %
Chemical X	1750 mg/kg	65%
Water	--	35%

$$\text{Calculated acute oral } LD_{50} = \frac{100\%}{\quad} = \frac{100\%}{\quad} \cong$$

Solutions to this and the next calculation slide can be found at the end of this PDF.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\% A_x}{TA_x}}$$

What is the calculated oral LD_{50} of a waste, if this is its composition:

Chemical	Acute oral LD_{50}	Weight %
Chemical X	1750 mg/kg	65%
Chemical Y	4225 mg/kg	35%

$$\text{Calculated acute oral } LD_{50} = \frac{100\%}{\quad + \quad} = \frac{100\%}{\quad + \quad} \cong$$

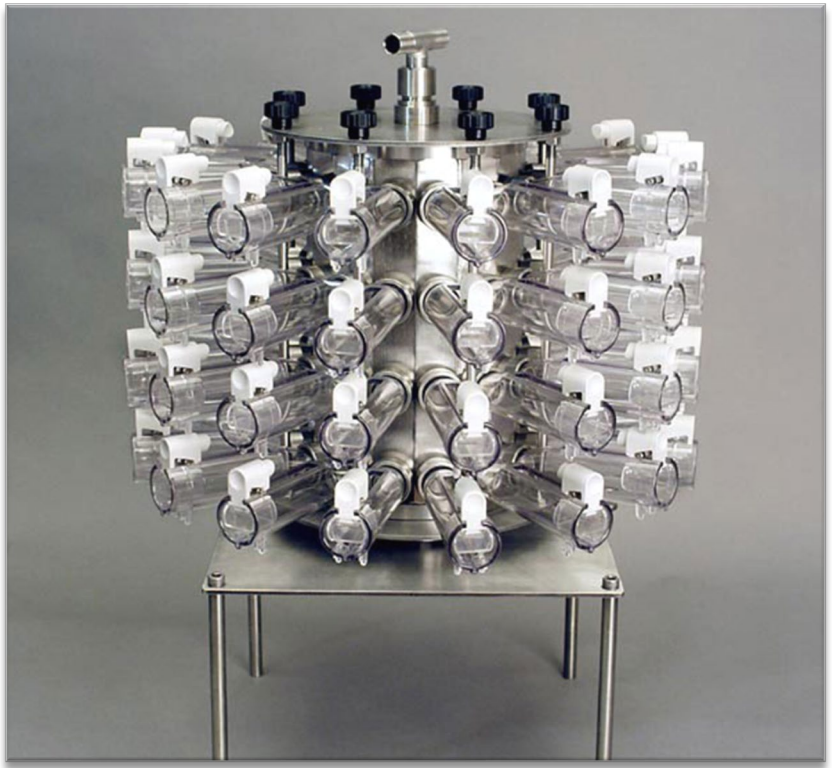
Solutions to this and the previous calculation slide can be found at the end of this PDF.

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Inhalation Toxicity 22 CCR § 66261.24(a)(5)
  - Waste is hazardous if its acute inhalation LC_{50} < 10,000 ppm



Applies to gases and vapors

Acute inhalation LC_{50} is defined in 22 CCR § 66260.10

22 CCR § 66261.24(b) describes a chemical test and a calculation that generators can use to make their determinations for this criterion without doing any tests on rats.

Characteristics of Hazardous Waste

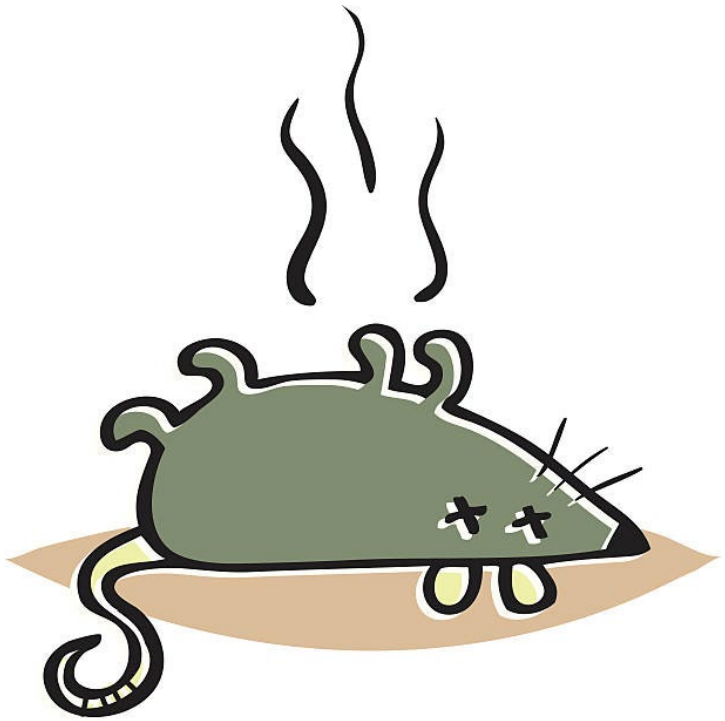
California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- Acute Aquatic Toxicity 22 CCR § 66261.24(a)(6)
  - Waste is hazardous if acute aquatic 96-hour LC_{50} < 500 mg/liter
    - ➢ AKA the fish bioassay
    - ➢ LC_{50} measured using:
      - fathead minnows
      - rainbow trout
      - golden shiners

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)



- Characteristic of Toxicity (22 CCR § 66261.24)
- Eight criteria for the Toxicity Characteristic:
  - Two leaching tests (TCLP and WET),
  - Total digestion test,
  - Four different direct acute toxicity (lethality to animals) tests,
  - A list of carcinogens, and
  - A "catch all" criterion.
- Toxic if satisfies any one of the elements

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Carcinogenicity 22 CCR § 66261.24(a)(7)

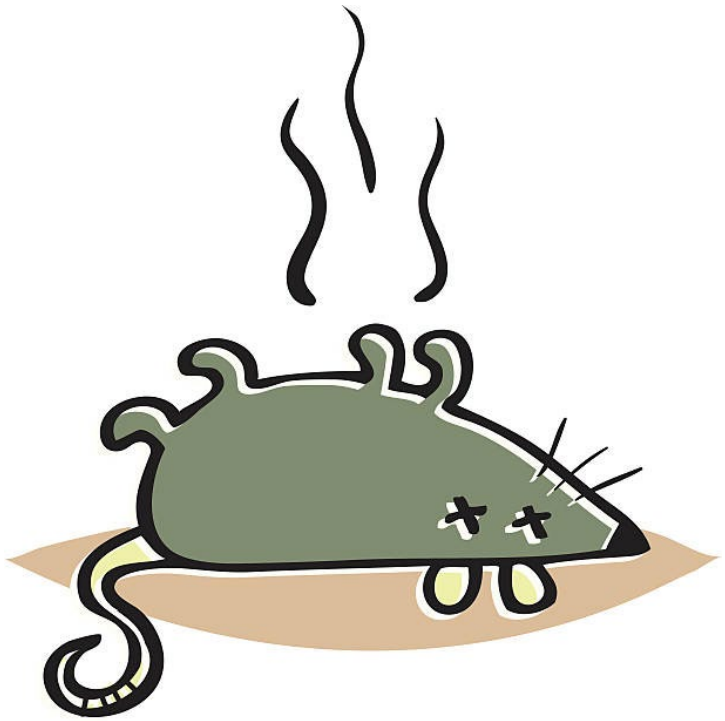
List of 16 carcinogenic substances (examples: acrylonitrile, benzidine, vinyl chloride)

2-Acetylaminofluorene (2-AAF)	4-Dimethylaminoazobenzene (DAB)
Acrylonitrile	Ethyleneimine (EL)
4-Aminodiphenyl	alpha-Naphthylamine (1-NA)
Benzidine and its salts	beta-Naphthylamine (2-NA)
bis (Chloromethyl) ether (BCME)	4-Nitrobiphenyl (4-NBP)
Methyl chloromethyl ether	N-Nitrosodimethylamine (DMN)
1,2-Dibromo-3-chloropropane (DBCP)	beta-Propiolactone (BPL)
3,3'-Dichlorobenzidine and its salts (DCB)	Vinyl chloride (VCM)

Hazardous if present in a waste in single or combined concentration equal to or exceeding 0.001 percent (10 ppm)

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)



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  - A list of carcinogens, and
  - A "catch all" criterion.
- Toxic if satisfies any one of the elements

Characteristics of Hazardous Waste

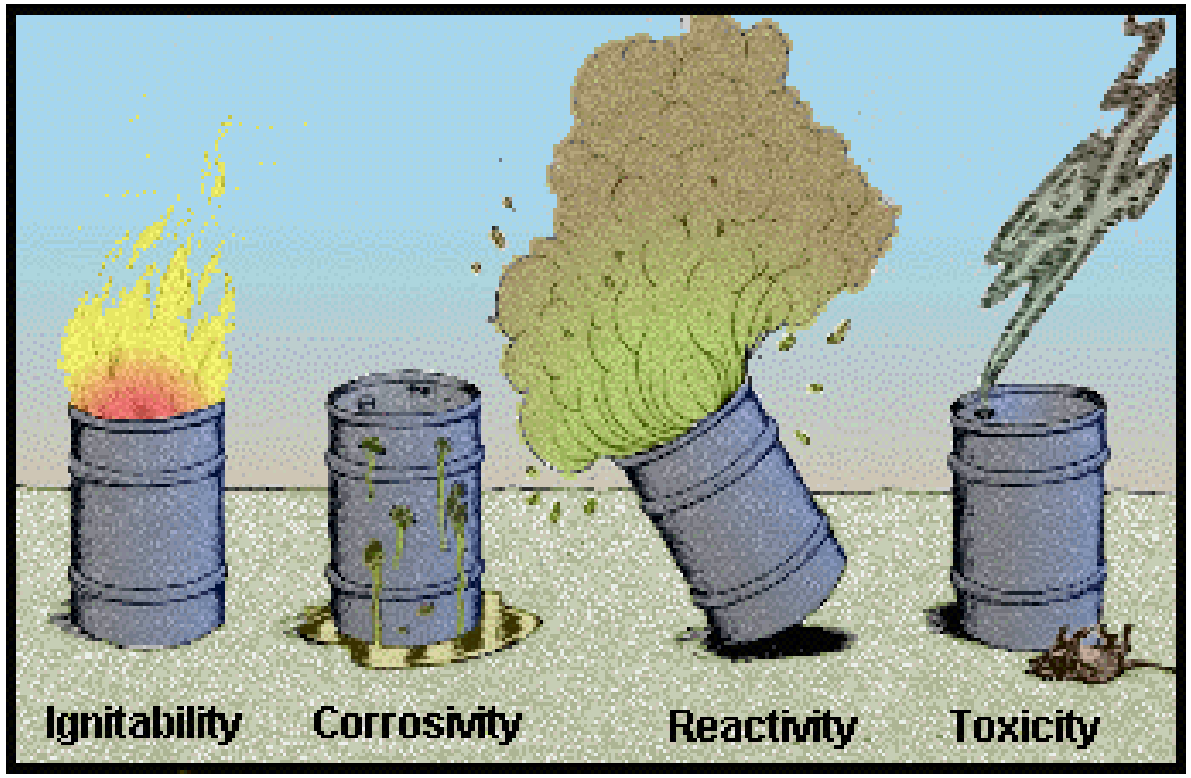
California's Toxicity Characteristic 66261.24(a)(2) – (8)

Experience or Testing 22 CCR § 66261.24(a)(8)

- Wastes shown through experience or testing to pose a hazard due to carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment.

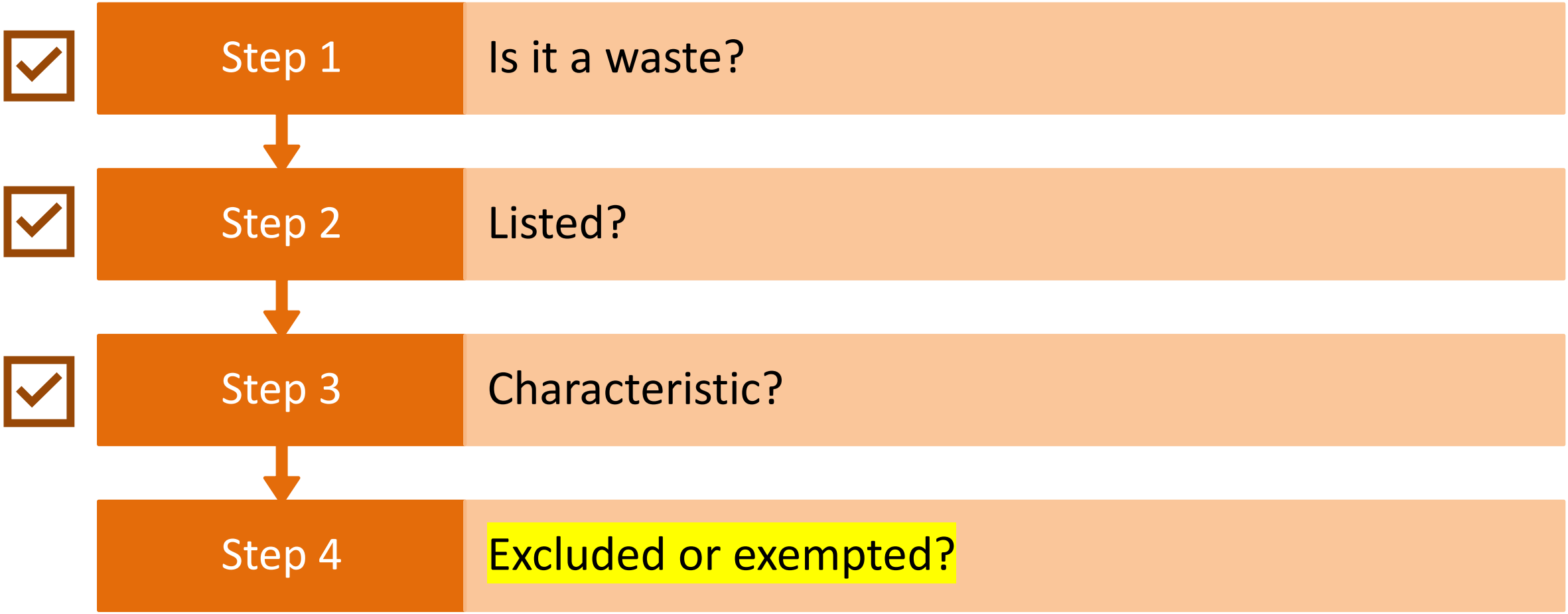
Health and Safety Code section 25141.5(a)
requires DTSC, when it has found a waste to be toxic by this criterion, to adopt that decision into regulation if that waste is likely to have broad application beyond the producer who initiated the request.

Characteristics of Hazardous Waste



1. Characteristic of Ignitability (22 CCR § 66261.21)
2. Characteristic of Corrosivity (22 CCR § 66261.22)
3. Characteristic of Reactivity (22 CCR § 66261.23)
4. Characteristic of Toxicity (22 CCR § 66261.24)

Hazardous Waste Determination Process



Exclusions vs Exemptions

- Excluded from the definition of a waste or hazardous waste
  - Out up front; no longer a waste or hazardous waste
  - Specific conditions need to be met

- Exempted from certain Laws or regulations
  - It is still a hazardous waste, but you do not need to manage it as a fully regulated hazardous waste
  - Alternative management standards
  - Specific conditions need to be met

EXCLUSIONS

Is it Excluded?

- 22 CCR §66261.4(a): Materials which are not wastes
- 22 CCR §66261.4(b): Wastes which are not hazardous wastes
- 22 CCR §66261.4(h) and (i): Cathode Ray Tube (CRT) panel glass
- HSC §25141.5(b)(2)(B): Acute Oral Toxicity
- HSC §25141.5.1: Plant Waste and Cannabis Waste
- HSC §25143.2(b) and (d): Recycling Law Exclusions
- Additional exclusions not covered in this training

Regulatory Exclusions
22 CCR §66261.4(a)

Materials which are not wastes

- Industrial wastewater discharge
- Source, special nuclear or by-product material
- Spent sulfuric acid used to produce virgin sulfuric acid
- Pulping liquors that reclaimed and reused
- Secondary materials that are reclaimed (closed loop recycling with reclamation)
  - No speculative accumulation
  - Not burned for energy recovery or UCD

Regulatory Exclusions
22 CCR §66261.4(b)

Wastes which are not hazardous wastes

- Infectious wastes (animal carcasses)
- Materials exempted or excluded from 40 CFR 261.4, if not listed in Article 4.1 and do not exhibit a characteristic
- Mining wastes
- Used oil re-refining still bottoms used in asphalt products
- Used CFC refrigerants

Regulatory Exclusions
22 CCR §66261.4(h) and (i)

- CRT panel glass
  - Not a hazardous waste for purposes of disposal
  - Must meet the criteria specified in §66273.81
  - Must be destined for disposal in a CRT panel glass approved landfill
  - Not subject to regulation by DTSC if managed according to § 25143.2.5

Comparison of federal and State exclusions (non-inclusive list)

Material	RCRA	Calif.
(1) Domestic sewage	Yes	No
(2) Industrial waste water (point source) discharges regulated under section 402 of the Clean Water Act	Yes	Yes
(3) Irrigation return flows	Yes	No
(4) Source, special nuclear, or by-product material as defined the Atomic Energy Act of 1954, as amended	Yes	Yes
(5) Materials subject to in-situ mining techniques which are not removed during the extraction process	Yes	No
(6) Pulping liquors that are reclaimed in pulping liquor recovery furnace and then reused in the pulping process, unless accumulated speculatively	Yes	Yes
(7) Spent sulfuric acid used to produce virgin sulfuric acid, unless it is accumulated speculatively	Yes	Yes

Continued…

Excluded Material	RCRA	Calif.
(8) Secondary materials that are reclaimed and returned to the original process or processes in which they were generated where they are reused in the production process [under certain provisions]	Yes	Yes
(9)(i) Spent wood preserving solutions that have been reclaimed and reused for their original intended purpose; and wastewaters from the wood preserving process that have been reclaimed and are reused to treat wood … etc.	Yes	No
(10) EPA Hazardous Waste Nos. K060, K087, K141, K142, K143, K144, K145, K147, and K148, and any wastes from the coke by-products process that are hazardous only because they exhibit the Toxicity Characteristic … etc.	Yes	No
etc.		

Acute Oral Toxicity Exclusion

HSC §25141.5 (b)(2)(B)

These substances are not hazardous wastes, if only hazardous by acute oral toxicity criteria.

- Acetic acid - vinegar
- Aluminum chloride - deodorant
- Ammonium bromide - textile finishing & anticorrosive agent
- Ammonium sulfate - food additive & fertilizer
- Anisole - perfumes & food flavoring
- Boric acid - eyewashes & heat-resistant glass
- Calcium fluoride -fluoridate drinking water
- Calcium formate - brewing & briquette binder
- Calcium propionate - food additive
- Cesium chloride - brewing & in mineral waters
- Magnesium chloride - flocculating agent
- Potassium chloride - salt substitute & food additive
- Sodium bicarbonate – (baking soda) antacids & mouthwashes
- Sodium borate decahydrate – (borax) laundry detergents
- Sodium carbonate – (soda ash) textile processing
- Sodium chloride - (table salt)
- Sodium iodide - iodine supplement and in cloud seeding
- Sodium tetraborate - (borax) used in laundry detergents
- The following oils commonly used as food flavorings: allspice oil, ceylon cinnamon oil, clarified slurry oil, dill oils, or lauryl leaf oil

Plant Waste and Cannabis Waste HSC §25141.5.1

- Newly adopted exclusion, effective January 1, 2025
- Cannabis plant waste fails toxicity when tested by the fish bioassay
  - Regulated hazardous waste (without the exclusion)
- Plant waste and cannabis waste solely exhibiting the hazardous waste characteristic of toxicity, pursuant to 22 CCR 66261.24 (a)(6), is excluded from classification as a hazardous waste
- Must still comply with Department of Cannabis Control and CalRecycle regulations for cannabis and plant waste

Recycling – Excluded Recyclable Material (ERM)

- HSC §25143.2(b): Recyclable materials (RCRA & non-RCRA)
  - Ingredients in industrial processes
  - Safe and effective substitute for commercial products
  - Returned to original process without first being reclaimed
  - NO RECLAMATION
- HSC §25143.2(d): Recyclable materials (non-RCRA)
  - (d)(1) recycled and reused on-site
  - (d)(2) product processed from a HW
  - (d)(3), (d)(4) transporter exclusions
  - (d)(5), (d)(6) similar to (b)(1),(b)(2) but for non-RCRA and allow 8 reclamation processes
  - (d)(7) chlorofluorocarbon used in heat transfer equipment such as mobile air-conditioning systems, fire extinguishing products

Recycling Exclusions Requirements for HSC §25143.2

- HSC 25143.2(e): “e” overrides - Automatically a HW
  - UCD, burned for energy recovery, speculative accumulation
- HSC 25143.2(f-h): Documentation, and other requirements
  - Maintain adequate records
  - ERM may still be a hazardous substance
  - Used oil exclusion

HSC 25143.9: Management Requirements for 25143.2 Exclusions

- Storage unit and labeling
  - Container, tank, *containment building, or waste pile*
  - Labeled “Excluded Recyclable Material” and/or “Used Oil”
- Emergency response
  - HMBP or *emergency plan*
- Storage requirements for each type of storage unit
  - *Broke existing requirements down into individual subsections*
  - Export requirements
- Lose exclusion!

EXCLUDED RECYCLABLE MATERIAL

STATE & FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR YOUR STATE DEPARTMENT OF TOXIC SUBSTANCES CONTROL.

GENERATOR INFORMATION:

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA ID NO. / MANIFEST DOCUMENT NO. _____ / NOT APPLICABLE

EPA WASTE NO. _____ CA WASTE NO. _____ ACCUMULATION START DATE _____

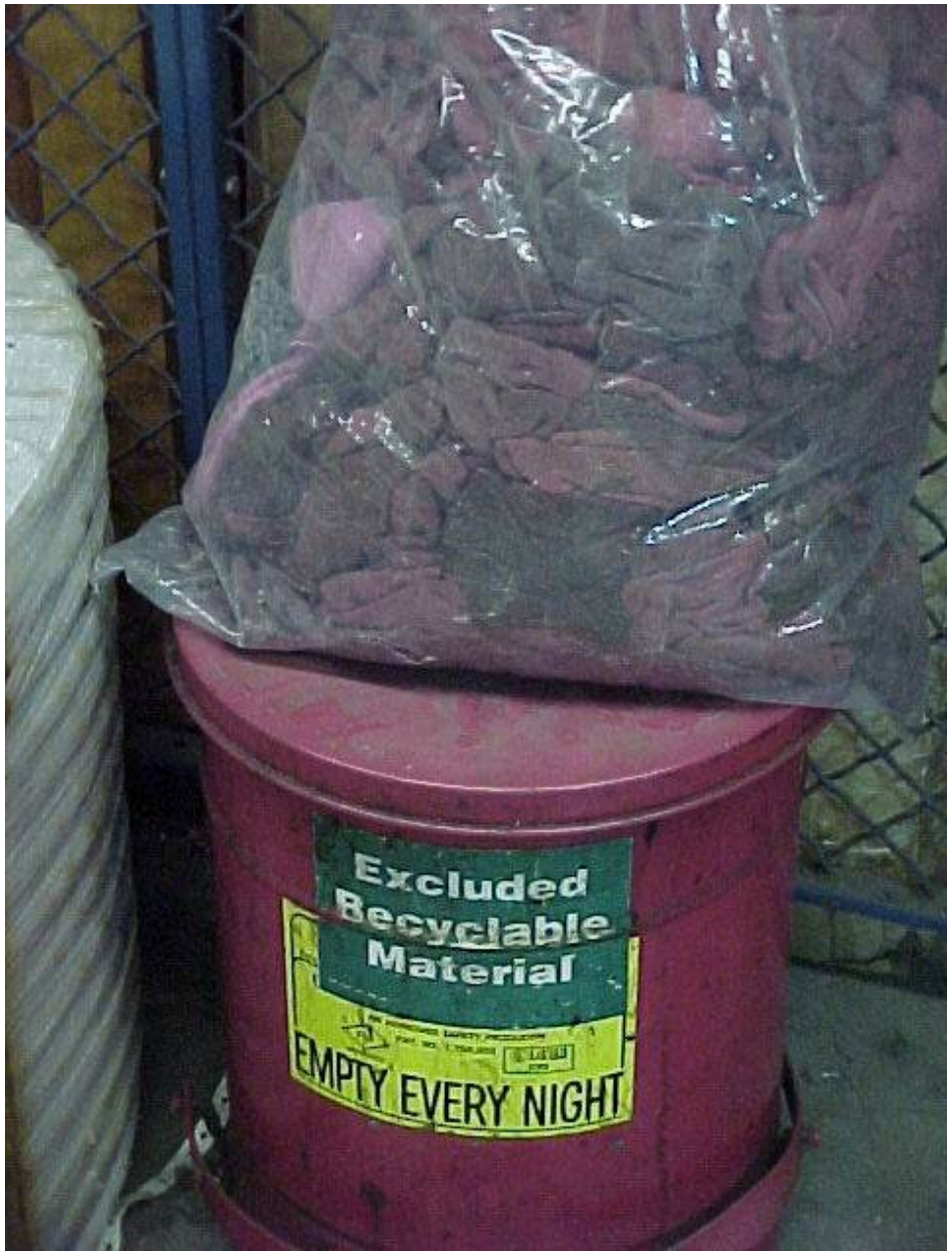
CONTENTS, COMPOSITION: _____

PHYSICAL STATE: ☐ SOLID ☐ LIQUID

HAZARDOUS PROPERTIES: ☐ FLAMMABLE ☐ TOXIC ☐ CORROSIVE ☐ REACTIVITY ☐ OTHER _____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!



EXEMPTIONS

Is it Exempted?

- HSC §25143.12: Petroleum-contaminated debris
- HSC §25143.7: Asbestos Waste (non-RCRA)
- 22 CCR §66261.4(c): HW generated in manufacturing tanks
- 22 CCR §66261.4(d)-(f): Samples
- 22 CCR §66261.4(g): Controlled substances
- 22 CCR §66261.6(a)(3)(D): Industrial Ethyl Alcohol Exemption
- 22 CCR §66261.7: Contaminated containers
- Additional exemptions not covered in this training

Statutory Exemptions HSC §25143.12

Petroleum-contaminated debris

- Must meet the following conditions :
  - Consists of wood, paper, textiles, concrete rubble, metallic objects, solid manufactured objects
  - Not Federally regulated
  - Does not contain free liquids
  - Debris is not a container or tank that is subject to regulation as hazardous waste
  - Disposed in Class I or II landfill

Statutory Exemptions HSC §25143.7

Asbestos wastes (non-RCRA)

- What is asbestos hazardous waste?
  - Concentration must be ≥1%
  - Friable, powdered, or finely divided
- Exempt from disposal at a Class I Hazardous Waste Landfill
- Must be handled and disposed of in accordance with TSCA

Regulatory Exemptions
22 CCR §66261.4(c)

- Hazardous waste generated in:
  - Product or raw material storage tanks, vehicles, vessels, or pipelines
  - A manufacturing process unit or an associated non-waste-treatment-manufacturing unit

*Exempt unless the waste exits the unit or remains in unit for more than 90 days after operation ceases

Regulatory Exemptions
22 CCR §66261.4(d)

- Samples: collected for testing to determine characteristics or composition
  - Subject to regulation as a waste after use as a sample ceases
  - Do not need to be manifested but must comply with applicable shipping requirements
  - Stored for less than 90 days before transport to a laboratory
  - Stored at a laboratory before or after testing
  - Mass of a sample imported/exported to a laboratory must not exceed 25kg

Regulatory Exemptions
22 CCR §66261.4(e)

- Treatability Study Samples (exemption for the generator):
  - Sample must be collected/prepared for transport by the generator
  - Sample mass limits per waste stream
    - 400kg HW, 1kg acute HW, 250kg soil, water, or debris
  - Accumulation time limits
    - 1 year on-site, 10 days in-transit
  - Labeling requirements
  - Do not need to be manifested but must comply with applicable shipping requirements

Regulatory Exemptions
22 CCR §66261.4(f)

- Samples Undergoing Treatability Studies at Laboratories and Testing Facilities (exemption for the testing facility):
  - Notification requirements to the Dept.
  - Accumulation time limits
    - 90 days since study completion or 1 year since shipment initiated
  - Study may not involve placing HW on land, incineration, or open burning
  - Sample mass limits
    - 400kg total, 1kg extremely HW, 200kg soil, water, or debris
  - The facility maintains records for three years

Regulatory Exemptions
22 CCR §66261.4(g)

- Controlled substances:
  - Non-RCRA
  - Seized by a peace officer
  - Must be stored separate from chemicals seized from clan labs, under the control of LE
  - Do not have to be manifested, but must be under the control of LE and be accompanied by a shipping document
  - Incinerated at a non-hazardous waste incineration facility

Regulatory Exemptions
22 CCR §66261.6(a)(3)(D)

- Industrial ethyl alcohol
  - Newly adopted exemption; October 2024
  - Currently in effect under an emergency rulemaking, but DTSC is in the process of developing a regular rulemaking
  - Alcohol-based hand sanitizer is exempt from most hazardous waste requirements when it is legitimately recycled to encourage generators to reduce their hand sanitizer stockpiles
  - Must still comply with local codes, DOT regulations, and regulations pertaining to imports and exports

Hazardous Waste Exemptions
22 CCR §66261.7

- Contaminated containers
  - Exempt when “empty”
  - Definition varies between CA and USEPA
    - CA is more stringent; Federal regulations allow up to one inch or 3%
  - Reclaimed, reconditioned, or refilled
  - Conditions vary depending on container size and type of waste
    - Bulk containers >119gal, <0.3% by weight of the total capacity
    - Acute and extremely hazardous wastes have more stringent requirements
  - Containers <119gal are empty when:
    - Pourable wastes no longer pour when container inverted
    - Non-pourable wastes are scraped out or otherwise removed

HSC 25143.10: Reporting Requirements for 25143.2 Exclusions and Exemptions

- *Generator:* Recyclable Materials Report (RMR)
  - Initial, re-notification
- *Brokers, Intermediary* and Recycler: RMR
  - Initial, re-notification
- *RMR submittal when generation, accumulation, management, or recycling of the material is permanently discontinued.*
- Submission through CERS
- RMR has been updated to clarify these requirements
- Violation

UNIFIED PROGRAM CONSOLIDATED FORM
HAZARDOUS WASTE

RECYCLABLE MATERIALS REPORT – PAGE 1

FOR EXCLUDED OR EXEMPTED MATERIALS ONLY

Page ___ of ___

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3

☐ This is a first time notification. The first month in which I generated more than 100 kg of recyclable material was: 500

☐ This is a biennial notification. BEGINNING DATE (even year) 500 January 1, ENDING DATE (odd year) 501 December 31,

☐ This is a notification of closure/cessesion of recycling activities.

☐ I do not generate more than 100 kg of recyclable materials in any month. This is a courtesy notification of recycling activity. 576

I. DECLARATION OF RECYCLING ACTIVITIES

1. All of the wastes/recycled materials reported on this form are generated and recycled onsite. ☐ YES ☐ NO 502

→ If YES, you are both the generator and recycler. Complete sections II, V, and Page 2.

2. The wastes/recycled materials reported on this form are generated at one location and handled/recycled at another location. ☐ YES ☐ NO 503

☐ I generate the recyclable material → If YES, complete Sections II-V and Page 2.
☐ I manage/store/transfer the material for any amount of time → If YES, complete Sections II, III, and V
☐ I am the end recycler of the material → If YES, complete Sections II, IV, and V

* Generators who recycle offsite should work with the recycling facility to obtain the information for Sections IV and Page 2.

II. GENERATOR OF RECYCLABLE MATERIAL

GENERATOR OF RECYCLABLE MATERIAL 504		EPA ID#	2
STREET ADDRESS 506		CERS ID 1a	PHONE 507
CITY 508		STATE 509	ZIP CODE 510
MAILING ADDRESS (IF DIFFERENT) 511			
CITY 512		STATE 513	ZIP CODE 514

III. INTERIM OFFSITE HANDLER OF RECYCLABLE MATERIAL

HANDLER OF RECYCLABLE MATERIAL 560		EPA ID#	2
STREET ADDRESS 561		CERS ID 1a	PHONE 562
CITY 563		STATE 564	ZIP CODE 565

IV. RECYCLER OF RECYCLABLE MATERIAL

RECYCLER OF RECYCLABLE MATERIAL 570		EPA ID#	2
STREET ADDRESS 571		CERS ID 1a	PHONE 572
CITY 573		STATE 574	ZIP CODE 575

V. CERTIFICATION SECTION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete.

SIGNATURE OF CERTIFIER	DATE 515	NAME OF DOCUMENT PREPARER 516
NAME OF SIGNER (print) 517	TITLE OF SIGNER 518	

Recyclable Materials Biennial Report Page 1 of 2

UPCF (6/24 Revised)

UNIFIED PROGRAM CONSOLIDATED FORM
HAZARDOUS WASTE

RECYCLABLE MATERIALS REPORT – PAGE 2

FOR EXCLUDED OR EXEMPTED MATERIALS ONLY

(one description per material recycled, attach additional pages, if needed)

TOTAL NUMBER OF RECYCLABLE MATERIALS _____ 519 Page ___ of ___

GENERATOR CERS ID# 1a BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3

VI. RECYCLABLE MATERIAL INFORMATION

A. DESCRIPTION

COMMON NAME OF WASTE TO BE RECYCLED (RECYCLABLE MATERIAL) 521	TOTAL QUANTITY RECYCLED IN REPORTING PERIOD 522	UNITS 523
		☐ a. Gallons ☐ c. Pounds ☐ b. Kilograms ☐ d. Tons

DESCRIPTION OF THE RECYCLING PROCESS AND BENEFICIAL USE OF RECYCLABLE MATERIAL 525

BASIS FOR CLAIM TO EXCLUSION OR EXEMPTION: 527 THE WASTE MATERIAL IS BEING RECYCLED BY (SELECT ONE):	AUTHORIZING PROVISION OF HSC SECTION 25143.2 526
☐ Being a refinery waste being converted to pet coke ☐ Being used as an ingredient to make a new product (without being reclaimed) ☐ Being used as a substitute for a commercial product (without being reclaimed) ☐ Being returned to its original process as feedstock (without being reclaimed) ☐ Being recycled and used at the location at which it was generated ☐ Being used as an ingredient to make a new product (with reclamation) ☐ Being used as a substitute for a commercial product (with reclamation) ☐ Being a CFC/HCFC which is reused or recycled	

B. PRODUCT AND CONSTITUENT INFORMATION: END RECYCLER

Only complete if recyclable material was used to make or substitute for a product (HSC Section 25143.2(b) or (d)(5) or (6).)

HAZARDOUS CONSTITUENT	HAZARDOUS CONSTITUENT In Recyclable Material	HAZARDOUS CONSTITUENT In Final Product	LIST FINAL PRODUCT(S) MADE FROM THIS RECYCLABLE MATERIAL AND BENEFICIAL USE OF FINAL PRODUCT(S)
528	529 UNITS 530 a percent ☐ b ppm ☐	531 UNITS 532 a percent ☐ b ppm ☐	533
534	535 UNITS 536 a percent ☐ b ppm ☐	537 UNITS 538 a percent ☐ b ppm ☐	539
540	541 UNITS 542 a percent ☐ b ppm ☐	543 UNITS 544 a percent ☐ b ppm ☐	545
546	547 UNITS 548 a percent ☐ b ppm ☐	549 UNITS 550 a percent ☐ b ppm ☐	551

If more than four constituents are recycled, attach additional sheets using this same format.

V. DOCUMENTATION OF KNOWN MARKET

☐ DISPOSITION OF RECYCLABLE MATERIAL: 552
Attach documentation that there is a known market for disposition of the recyclable material and any products manufactured from the recyclable materials.

Recyclable Materials Biennial Report Page 2 of 2

UPCF (6/24 Revised)

Slido Poll #8

What is the main difference between an exclusion and an exemption?

A. Excluded waste is excluded from the classification of a hazardous waste

B. Exempted waste is exempt from hazardous waste classification

C. Excluded waste is excluded from certain laws or regulations, but still have alternative management standards

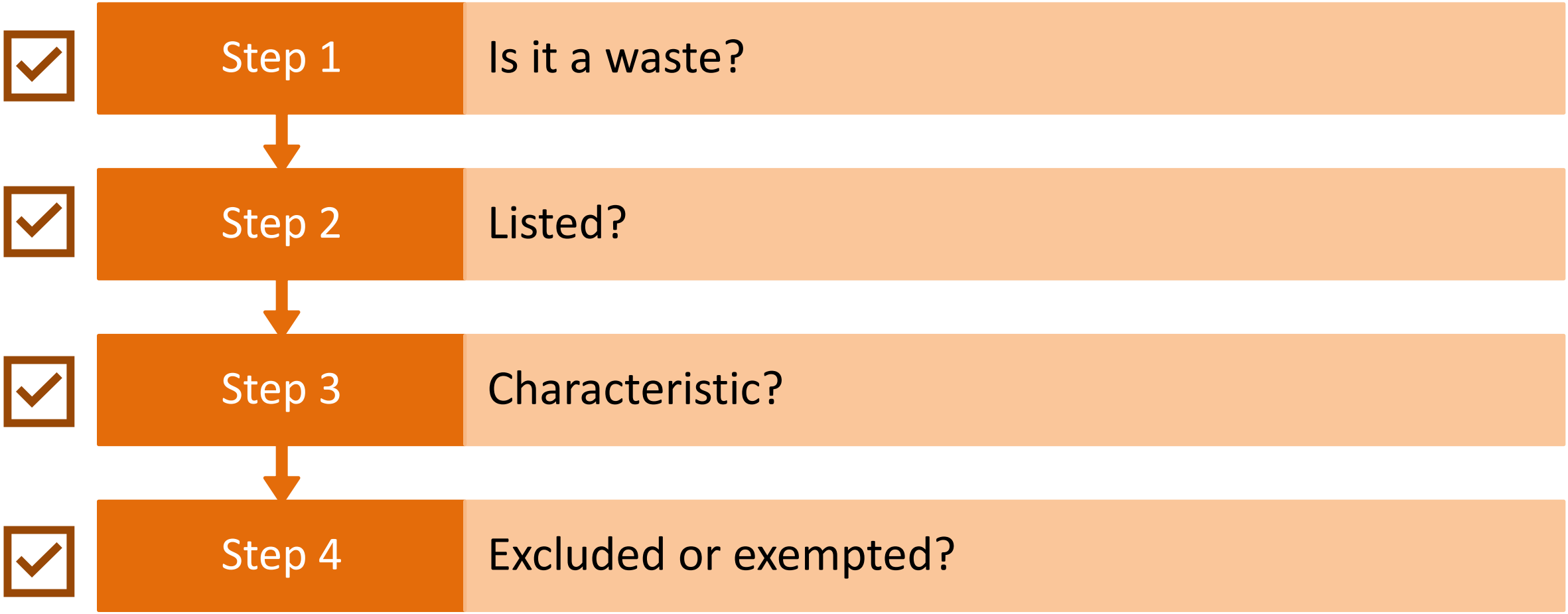
Slido Poll #9

What are the two newly adopted exclusions and exemptions that I mentioned in this training?

REMEMBER

- The only person who can claim an exclusion and proceed to manage the material as an excluded recyclable material, is the generator.
- Look at the entire process from beginning to end to make sure all the conditions are met along the way.

Hazardous Waste Determination Process



Training Topics

1. Hazardous waste laws
2. Is it a waste?
3. Is it a listed hazardous waste?
4. Does it display a characteristic of hazardous waste?
5. Is it excluded or exempted?
6. The mixture and derived-from rules and contained-in policy
7. The meaning of Appendix X
8. Self-classification options

Different Rules for Characteristic and Listed Hazardous Waste

- Mixture Rule
- Derived-from Rule
- Contained-in Policy

Characteristic Wastes

- Mixture Rule - Characteristic Wastes 22 CCR §66261.3(b)(4)
- Derived-From Rule - Characteristic Wastes 22 CCR §66261.3(c)

Mixture Rule - Characteristic Wastes 22 CCR §66261.3(b)(4)

- Wastes mixed with either a RCRA or a non-RCRA characteristic hazardous waste are hazardous waste only if the resulting mixture still exhibits a hazardous characteristic

- Intentional mixture to avoid regulation is treatment, and requires authorization

Derived-From Rule - Characteristic Wastes 22 CCR §66261.3(c)

- Wastes derived from the treatment, storage or disposal of either a RCRA or a non-RCRA characteristic hazardous waste are hazardous waste only if the resulting waste still exhibits a hazardous characteristic

Listed Wastes

- Mixture Rule - Listed Wastes22 CCR §66261.3(a)(2)(E) and (F)
- Derived-From Rule - Listed Wastes 22 CCR §66261.3(c)

Mixture rule – RCRA Listed Wastes

- 22 CCR §66261.3(a)(2)(E) and (F)
- Mixtures of wastes and RCRA listed hazardous wastes are listed hazardous wastes
  - Concentrations are irrelevant

Mixture rule – RCRA Listed Wastes

- Exceptions:
  - Waste has been delisted by US EPA
  - Wastes listed solely due to characteristics other than (T) or (H), and mixture does not exhibit a characteristic
  - Wastewaters containing de minimis concentrations of listed hazardous wastes discharged under the Clean Water Act provisions
  - Wastes containing minimal losses of P or U listed waste due to normal handling or minor leaks

Derived-From Rule RCRA Listed Wastes

- 22 CCR §66261.3(c)
- Wastes generated from the treatment, storage, or disposal of listed hazardous waste are hazardous waste

Derived-From Rule- RCRA Listed Wastes

- Exceptions:
  - Wastes delisted by US EPA
  - Pickle liquor sludge
  - Biological treatment sludge (K156 and K157)
  - Slag from high temperature metal recovery

Derived-From Rule - Characteristic

- 22 CCR §66261.3(c)

- Wastes derived from the treatment, storage or disposal of characteristic hazardous waste are hazardous waste only if the resulting mixture still exhibits a characteristic

Example

- K001 sludge is shipped to a treatment, storage, disposal facility (TSDF) to be incinerated.
- What is the regulatory status of the ash generated from the incineration of the sludge?

California's Mixture Rule for M-listed Waste

- 22 CCR §66261.3(b)(4)
- Not like the RCRA listed waste mixture rule
- Is a hazardous waste only if it meets a characteristic of a hazardous waste (toxic, corrosive, ignitable, reactive)

Slido Poll #10

Wastes mixed with either a RCRA or a non-RCRA characteristic hazardous waste are hazardous waste when:

A. Always, once a waste is a characteristic waste, it is always a characteristic waste

B. Only if intentional mixing to dilute the waste is done without a permit because the resulting waste is then considered a listed waste

C. All mixed waste is excluded from certain laws or regulations, but still has alternative management standards

D. Only if the resulting waste still exhibits a hazardous characteristic

RCRA Contained-In Policy

- Applies to contaminated media and debris
- Environmental media (water or soil) that contain listed hazardous wastes are hazardous wastes
  - Unless DTSC determines the listed waste is present at insignificant concentration (risk-based evaluation)

Training Topics

1. Hazardous waste laws
2. Is it a waste?
3. Is it a listed hazardous waste?
4. Does it display a characteristic of hazardous waste?
5. Is it excluded or exempted?
6. The mixture and derived-from rules and contained-in policy
7. The meaning of Appendix X
8. Self-classification options

What is Appendix X?

- List of 791 chemicals
- List of 66 common names or types of hazardous wastes
- Characteristic of concern noted (X,C,I,R)
- A tool for generators
- List creates a “presumption” – Wastes listed in Appendix X or containing a listed chemical are presumed hazardous by characteristic
- Can be classified as nonhazardous by using testing or knowledge, as with other wastes

Training Topics

1. Hazardous waste laws
2. Is it a waste?
3. Is it a listed hazardous waste?
4. Does it display a characteristic of hazardous waste?
5. Is it excluded or exempted?
6. The mixture and derived-from rules
7. The meaning of Appendix X
8. Self-classification options

Self-Classification Options

Classification Of A Waste as Hazardous or Nonhazardous
22 CCR §66260.200

- DTSC nonhazardous waste concurrence: 22 CCR §66260.200(d),(e),(m)
  - Departmental timelines
- DTSC reclassification: 22 CCR §66260.200(f)
  - Non-RCRA waste w/mitigating chemical or physical characteristics
  - Departmental timelines
- DTSC special waste: 22 CCR §66261.124

* ***<u>All DTSC determinations are subject to fee for service!</u>*** *

HSC § 25205.7

TRAINING RESOURCES

- DTSC's California Hazardous Waste Classification Training
- DTSC Online Reference Library (DORY)
- RCRA Online
- RCRA Orientation Manual
- U.S. EPA's Defining Hazardous Waste page
- U.S. EPA's User-friendly Reference Guide for 261.4(b) exclusions
- U.S. EPA Regulatory Exclusions and Alternative Standards for the Recycling of Materials, Solid Wastes and Hazardous Wastes
- U.S. EPA Basis for the Listing

Any Questions?

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Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

What is the calculated oral LD_{50} of a waste, if this is its composition:

Chemical	Acute oral LD_{50}	Weight %
Chemical X	1750 mg/kg	65%
Water	--	35%

$$\text{Calculated acute oral } LD_{50} = \frac{100\%}{\frac{65\%}{1750\ \text{mg/kg}}} = \frac{100\%}{0.037\%\ \text{kg/mg}} \cong 2702.7\ \text{mg/kg}$$

Characteristics of Hazardous Waste

California's Toxicity Characteristic 66261.24(a)(2) – (8)

Acute Toxicity

- 22 CCR § 66261.24(c) – Calculation for classifying waste mixtures by acute oral and acute dermal toxicities.

$$\text{Calculated oral or dermal } LD_{50} = \frac{100\%}{\sum_{x=1}^{n} \frac{\%\ A_x}{TA_x}}$$

What is the calculated oral LD_{50} of a waste, if this is its composition:

Chemical	Acute oral LD_{50}	Weight %
Chemical X	1750 mg/kg	65%
Chemical Y	4225 mg/kg	35%

$$\text{Calculated acute oral } LD_{50} = \frac{100\%}{\frac{65\%}{1750\ mg/kg} + \frac{35\%}{4225\ mg/kg}} = \frac{100\%}{0.037\%\ kg/mg + 0.0083\%\ kg/mg} \cong 2207.5\ mg/kg$$

$$= 0.0453\ \%\ kg/mg$$