



**What Type
of Wastes
Do I Generate?**





Michigan Environmental Compliance Conference

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Environmental Assistance Center (EAC)

Phone: 1-800-NO2-WASTE
(1-800-662-9278)

Hours: 8:00 am to 4:30 pm
Monday – Friday

Compliance Assistance Services Cover:

Air	Environmental Audit Privilege
Waste	Brownfield Redevelopment
Water	Site Remediation
Storage Tanks	Permit Coordination



Waste Session 1

Waste Characterization, Exclusions/Exemptions, and Determining Generator Status

Why Cover These Topics

Hazardous waste regulations. . .

apply to all businesses, including municipalities, hospitals, and service industries, not just manufacturing industries

are written broadly to address hazards posed by all waste streams

Why Cover These Topics

Hazardous waste regulations require each business, by site, to . . .

evaluate the character and composition of their wastes

determine the total weight of all hazardous waste generated monthly on a continuous basis

Why Cover These Topics

Hazardous waste regulations require each business, by site, to . . .

based on the amount and types of hazardous waste generated each month, the business is required to determine the legal disposal options

less hazardous waste = less regulation and more disposal options under the law

Why Cover These Topics

There is no 1 best answer for how to dispose of waste for all businesses and all locations

Each business location must evaluate and select their own preferred disposal options based on their facility circumstances

Why Cover These Topics

Site specific disposal needs vary based on. . .

Type of hazardous wastes generated

Amount of hazardous wastes generated

Disposal options

Proximity of disposal facilities

Cost of disposal

On-site “real-estate” to sort, store, & treat

On-site disposal options

Waste hazards

Employee culture (trainability)

Waste Characterization

Regulations requiring waste characterization:

Act 451, Michigan Natural Resources & Environmental Protection Act:

Part 111, Hazardous Waste

Part 121, Liquid Industrial Waste

Part 115, Solid Waste

Part 169, Scrap Tires

Act 368, Michigan Public Health Code:

Part 138, Medical Waste Regulatory Act

Part 2, Ionizing Radiation Rules

Federal Toxic Substance Control Act (TSCA)



Waste Characterization

Where do I start?

Perform a waste survey to identify what wastes are generated at your facility

Tour your entire facility and inventory all waste streams

Don't overlook identifying & characterizing ALL waste streams

Waste Survey

Non-Production Areas



Drains



Discontinued Lines

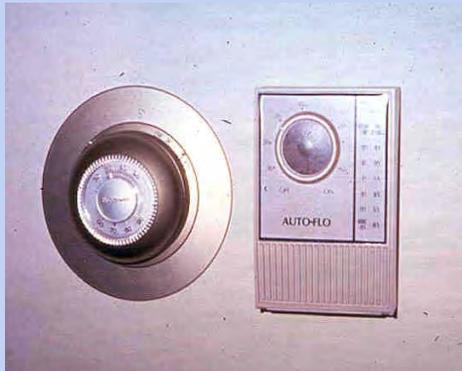
Waste Survey

Office Activities

Electronics



Batteries



Thermostats



Electric Lamps

Waste Survey

Aerosol Cans



Can crushing & puncturing



Ignitable & could have TCLP issues

Waste Survey

Remodeling/Demolition Debris

Demolition debris



**Gym
Flooring**

Abrasive blasting



Waste Survey

Fleet Maintenance



**Antifreeze & Mercury
Switches**



Parts Washer



Used Oil

Waste Survey

Rags & Textiles



Commercially launder & reuse!

Waste Survey

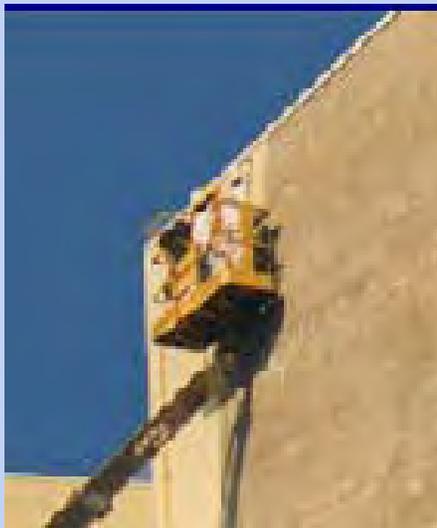
Laboratory & Art Activities



**Ignitable, Corrosive, Reactive,
TCLP, and listed waste issues**

Waste Survey

Painting & Solvents



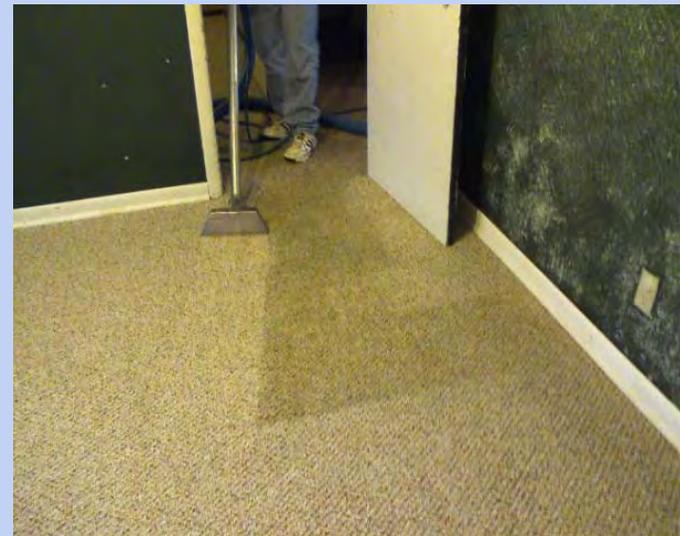
**Ignitable &
TCLP issues**

Waste Survey

Cleaning Operations



Power Washing



Carpet Cleaning

Waste Characterization

Who Does it?

Do the waste characterization yourself

Hire a consultant

Use a disposal vendor

Use a combination of the above

Waste Characterization

How do you do it?

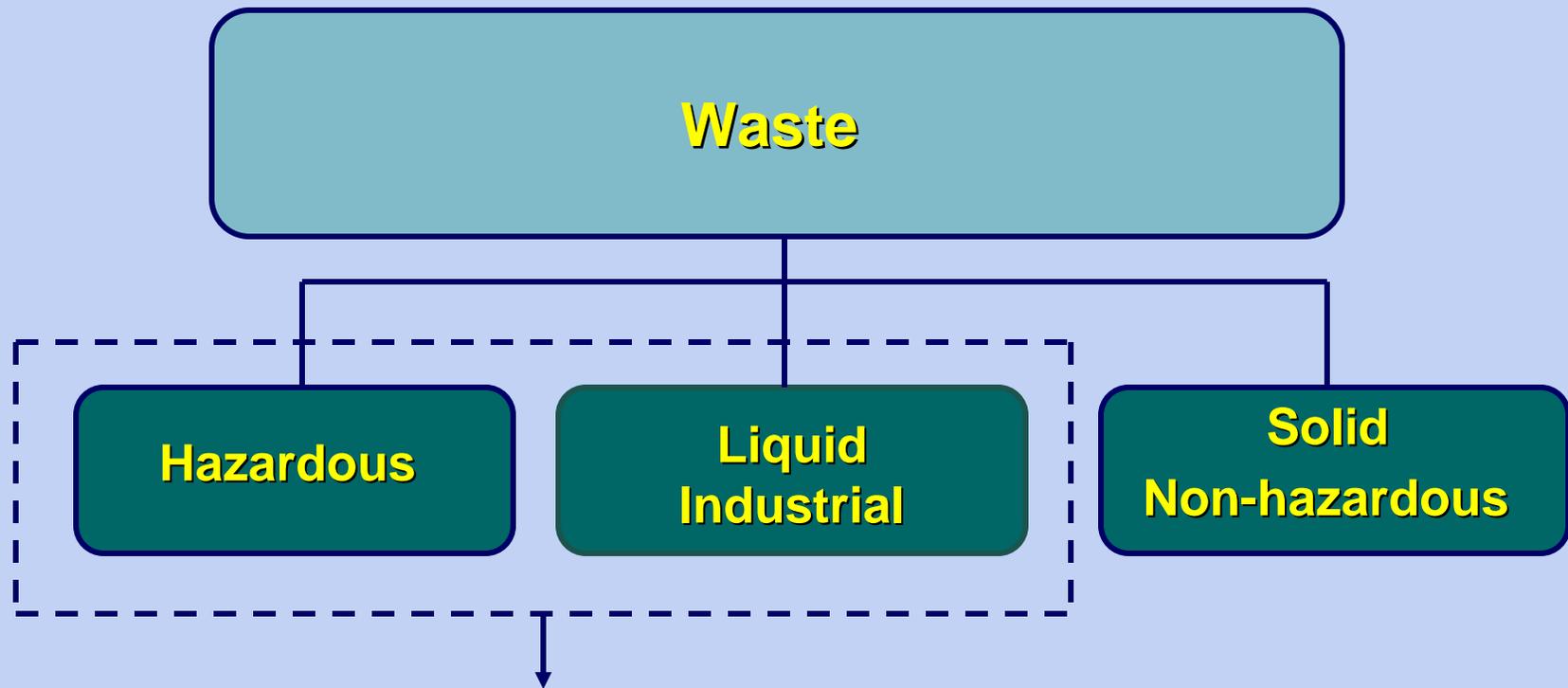
Knowledge:

- MSDS
- Process Information
- Technical Information
- Manufacturer Information
- Hazardous Waste Listings
- Other Lab Results

Testing:



Waste Characterization Regulatory Overview



Subject unless excluded:

- **Hazardous if listed or characteristic**
- **Liquid industrial if free liquids**

Waste Characterization

Basics

Listed Hazardous Waste (F, K, P & U wastes)

Common waste stream known to be hazardous without testing

Characteristic Hazardous Waste (D wastes)

Waste stream found to be ignitable, corrosive, reactive, and/or toxic by testing or use of knowledge

Hazardous Waste Mixture Rule

Mixture of a listed hazardous waste with other non-hazardous wastes is all a listed hazardous waste

Hazardous Waste Derived From Rule

Residues derived from treating a listed hazardous waste are a listed hazardous waste

Waste Characterization

Basics Steps

- 1. Is waste listed - Review lists of waste types & codes in rules**
- 2. Is waste characteristic - Analytic test or by knowledge (MSDS, knowledge of process, etc.)**
- 3. Does exclusion or exemption apply**

Waste Characterization

Basics Steps

- 4. Do other regulations apply - Liquid industrial or solid waste, etc.**
- 5. Create & maintain characterization records – Required for at least 3 years from the date waste was last shipped off-site or treated/disposed on-site**
- 6. Re-characterize – If there is a change in process or materials**

Waste Characterization

Step 1

Listed Hazardous Waste Evaluation

Waste Characterization

What are listed hazardous wastes?

- **F Codes (Table 203a) – wastes from common non-specific sources** (e.g. spent chlorinated solvents, metal treatment wastewaters and sludges)
- **K Codes (Table 204a) – wastes from specific industries, includes some Michigan only codes** (e.g. petroleum refining and wood treatment wastes)

Waste Characterization

What are listed hazardous wastes?

- **P & U Codes (Table 205a-c) - commercial chemical products, off-specification products, container/spill residues, includes some Michigan only U codes; (e.g. formaldehyde, parathion, benzene, DDT, xylene)**
- ***P Codes are all acutely hazardous***

Waste Characterization

Listed Hazardous Waste Codes

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Table 203a

EPA Hazardous Waste Number	Hazardous Waste From Nonspecific Sources	Hazard Code
F026	Wastes, except wastewater and spent carbon from hydrogen chloride purification, from the production of materials on equipment previously used for the manufacturing use as a reactant, chemical intermediate, or component in a formulating process of tetra-, penta-, or hexachlorobenzene under alkaline conditions	(H)
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulation containing compounds derived from these chlorophenols. This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component	(H)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA hazardous waste numbers F020, F021, F022, F023, F026, and F027	(T)
F032	Wastewaters, except for those that have not come into contact with process contaminants; process residuals; preservative drippage; and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations, except potentially cross-contaminated wastes that have had the F032 hazardous waste number deleted pursuant to 40 C.F.R. §261.35 or potentially cross-contaminated wastes that are otherwise currently regulated as F034 or F035, and where the generator	(T)

Acutely hazardous when "H" hazard code included

Waste Characterization

Step 2

Characteristic Hazardous Waste Evaluation

Waste Characterization

What are characteristic hazardous wastes

Characteristic Hazardous Waste Codes:

Ignitable - D001

Corrosive - D002

Reactive - D003

Toxic - D004 – D043 (Table 201a)

**Severely Toxic – 001S - 007S
(Table 202, includes dioxins & furans)**

Characteristic Hazardous Waste Common Tests

- **Flash point** – Used for testing ignitability
< 140 F (D001)

Examples: paints, solvents

- **pH** – Used for testing corrosivity
 ≤ 2 or ≥ 12.5 (D002)

Examples: acids, bases

Characteristic Hazardous Waste Common Tests

- **Reactivity** – Test as required for DOT classification for materials that are unstable at normal conditions, reacts violently with water, explodes, and/or emits toxic gas (D003)

Examples: lithium hydride & trichlorosilane

Characteristic Hazardous Waste Common Tests

- **TCLP (Toxicity Characteristic Leaching Procedure)** - Used for testing leaching potential for Table 201a hazardous constituents (D004-D043)

Examples: Paints or sludges containing metals or MEK, contaminated media

Characteristic Hazardous Waste Common Tests

- **Total Halogens** - Used for testing used oils for chlorine, fluorine, bromine, etc. to determine if a “presumed” hazardous waste

Examples: Used oil that contains more than 1,000 parts per million is presumed to be a hazardous waste per Rule 203(1)(e)

Waste Characterization

Step 3

Exclusion/Exemption Evaluation

(Rules 202, 203, 204, 206, 207, and 228 –
not all inclusive)

Waste Characterization

What are exemptions & exclusions?

- Wastewater discharges to sanitary sewer *approved* by the sewer authority are exempted at the point of discharge to the sewer (management prior to discharge may be subject to regulation)
- Batteries, pesticides, mercury devices, electric lamps, pharmaceuticals, consumer electronics & antifreeze handled as Universal Waste enjoy a partial exemption

Waste Characterization

What are exemptions & exclusions?

- Wastes that are used or reused in a process to make a product are excluded provided there is no reclamation - *Beware of sham recycling and get DEQ concurrence on exemption & supporting documentations required*
- Laboratory samples are exempt until discarded
- Used oils that are recycled

Waste Characterization

What are exemptions & exclusions?

- Petroleum contaminated media from leaking UST systems that fail the TCLP for D018 – D043 only & are being remediated under DEQ approval pursuant to Part 213
- Off-specification fuel (gasoline, kerosene, diesel, etc.) being recycled for use as fuel or burned as fuel (not incinerated)

Waste Characterization

What are exemptions & exclusions?

- Materials remaining in manufacturing units that would otherwise be hazardous wastes - If taken out of service the material becomes a hazardous waste (degreasers, paint pots)
- Laundered rags that are reused that would otherwise be a hazardous waste

Waste Characterization

What are exemptions & exclusions?

- **Hazardous wastes from which precious metals are recovered (partial exemption)**
- **Dredge spoils from projects permitted by the US Army Corps of Engineers or DEQ**
- **Scrap metal (bits and pieces of metal) that are recycled**

Waste Characterization

What are exemptions & exclusions?

- Wastes generated by households, including single and multiple residents, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreational areas
- Conditionally Exempt Small Quantity Generators enjoy a partial exemption
- Residues in containers are excluded if empty

Empty Containers

After all non-acute hazardous waste or liquid industrial waste has been removed using common practices:

No more than 1 inch or not more than 3.0% the weight of the capacity of the container for containers less \leq to 119 gallons in size

No more than 1 inch or not more than 0.3% the weight of the capacity of the container for containers $>$ than 119 gallons in size

Empty Containers

Acute Hazardous or Severely Toxic Waste:

Triple rinse with appropriate solvent or cleaned by proven equivalent method

Remove inner liner preventing contact with container

If listed due to characteristic only, empty if no longer exhibits the characteristic

Rinse water/removed residue would be listed hazardous waste based on knowledge (mixture rule)

Empty Containers

Compressed Gas:

Container pressure is equal to atmospheric pressure

Container is not clogged

No audible liquids in container when shaken

Exemptions & Exclusions

- No exclusions for 1 time or periodic events that change generators status
- Establish procedures to limit or prevent 1 time or periodic changes in generator status/classification
- Be prepared to meet higher regulatory requirements for events changing generator status/classification

Exemptions & Exclusions

- Any claim that a material is not a waste or is exempt from hazardous waste regulation must be demonstrated by the generator
- Where exemption is questionable, seek concurrence with hazardous waste regulatory staff

Waste Characterization

Step 4

Review if Liquid Industrial Waste
or Other Regulations Apply

Waste Characterization

Regulations requiring waste characterization:

Act 451, Michigan Natural Resources & Environmental Protection Act:

Part 111, Hazardous Waste

Part 121, Liquid Industrial Waste

Part 115, Solid Waste

Part 169, Scrap Tires

Act 368, Michigan Public Health Code:

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Waste Characterization

What is Liquid Industrial Waste?

- **Determined by using the Paint Filter Test, Method 9095 in EPA SW-846**
- **Rule of thumb – if there are any free liquids in the waste or if the waste is thinner than butter at or below 100 F, it should be managed as a liquid industrial waste**

Waste Characterization

What is Liquid Industrial Waste?

- Includes liquid CESQG hazardous wastes conditionally excluded from hazardous waste manifest & disposal at a licensed hazardous waste disposal facility
- Includes liquid waste that is not a listed or characteristic hazardous waste (used oil, antifreeze, wastewaters)

Liquid Industrial Waste

Examples

- Most antifreeze
- Some wastewater including most mobile power washing wastewater, carpet cleaning wastewater, food processing wastewaters
- Includes liquid wastes from other locations besides “industrial” sites (e.g. includes liquid waste from municipal, health care facilities, etc.)

Liquid Industrial Waste

Examples

- Most sludges from trench drains or blind sumps (unless there's been a release making it a hazardous waste)
- Storm sewer cleanout waste
- Grease trap waste
- Most used oils being recycled
- Off-specification fuels being recycled

Liquid Industrial Waste

Waste Codes

<u>WASTE STREAM</u>	<u>WASTE CODE</u>	<u>CONSOLIDATED WASTE CODE</u>
Mixed Solvents	007L	007LC
Pharmaceutical	014L	014LC
Crankcase Oil	017L	017LC
Coolants and Water Soluble Oils	019L	019LC
Other Oil	021L	021LC
Brine	022L	022LC
PCB	026L	026LC
Other wastes	029L	029LC
Antifreeze	030L	030LC
Storm Sewer Cleanouts	031L	031LC
Sanitary Sewer Cleanouts	032L	032LC
X-Ray/Photo Cleaning Solutions	033L	033LC
Water Based Cleaning Solutions	034L	034LC
Car Wash Sludges	035L	035LC
Grease Trap Wastes	036L	036LC

Waste Characterization

Step 5

Create/Maintain

Waste Characterization Record

Waste Characterization

Waste Characterization Records

Records for each waste stream may include:

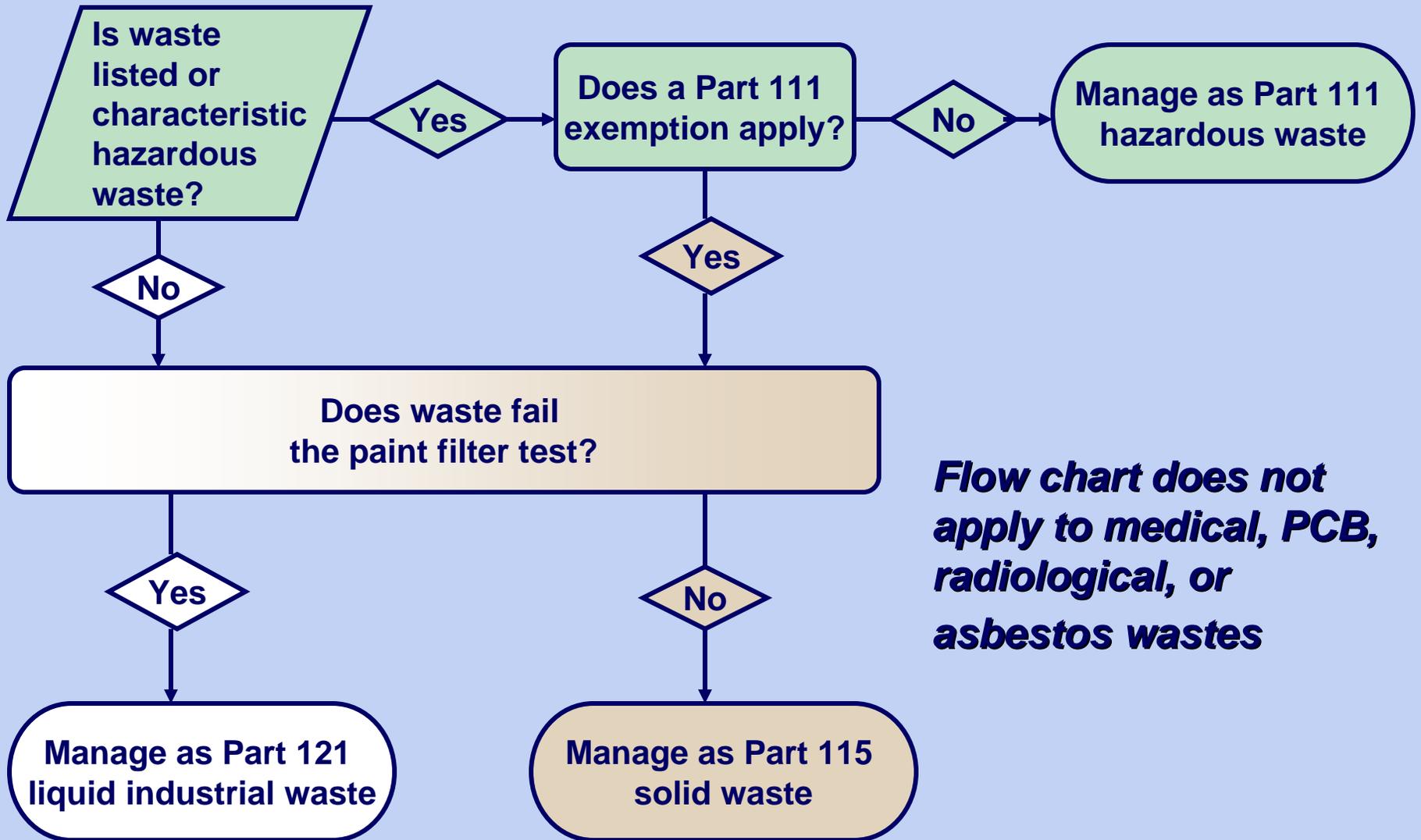
- Waste type/description
- Source of waste
- Test results
- Waste analyses records
- MSDS
- Sample procedure
- Representative sample information

Waste Characterization

Step 6

Re-characterize if
process or material change

Waste Characterization Flow Chart



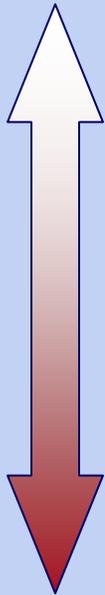
Flow chart does not apply to medical, PCB, radiological, or asbestos wastes

Generator Status

Once you know what wastes are hazardous or non-hazardous, including what is exempted or excluded, you must determine where you fall within the regulations

Hazardous Waste Generator Status

Less
Regulation



**Conditionally Exempt Small
Quantity Generator (CESQG)**

Small Quantity Generator (SQG)

Large Quantity Generator (LQG)

More
Regulation

Hazardous Waste Generator Status

Conditionally Exempt Small Quantity Generator

(CESQG)

- **Monthly hazardous waste generation < 220 lbs or ~ 1/2 drum **
- **Total hazardous waste accumulation always < 2200 pounds**
- **Wastes are properly disposed under other regulations**
- **Records of waste characterization and generator status are maintained for 3 years**

Hazardous Waste Generator Status

Small Quantity Generator (SQG)

- Monthly hazardous waste generation 220 lbs – 2,200 lbs ~1/2 to 5 drums



- Total hazardous waste accumulation always < 13,200 pounds

Hazardous Waste Generator Status

Large Quantity Generator (LQG)

- **Generates 2200 pounds non acute hazardous waste per month or**
- **Generates and accumulates 2.2 pounds acute or severely toxic waste**



Hazardous Waste Generator Status

Calculating Amount of Hazardous Waste Generated

Add up ALL the hazardous waste generated at the site in a calendar month

Calculate amounts per site

One site is under one identification number and is contiguous property

Hazardous Waste Generator Status

Calculating Amount of Hazardous Waste Generated

Calculate the amount in pounds or kilograms

Calculate the amount generated, not the amount shipped

Include hazardous waste treated and/or disposed on-site unless it is hard piped to sanitary sewer

Hazardous Waste Generator Status

Calculating Amount of Hazardous Waste Generated

Do not include:

- universal waste
- waste specifically excluded from Part 111 (scrap metal being recycled, fuel being recycled, or sanitary sewer approved direct discharges)
- liquid industrial waste
- used oil

Hazardous Waste Generator Status

Calculating Amount of Hazardous Waste Generated

Review total/maximum amount of hazardous waste accumulated at any 1 time during the month

Compare amount of hazardous waste generated and total accumulated during the month to the CESQG, SQG, and LQG definitions/limits

Generator limits are found in Rule 306 of the Part 111 rules

Hazardous Waste Generator Status

Calculating Amount of Hazardous Waste Generated

Specific requirements that apply are based on the volume of hazardous waste generated monthly and the total amount of hazardous waste accumulated at 1 time

The more waste generated monthly or the more waste stored at any 1 time, the more regulatory requirements a facility must meet

NEED HELP?

- ✓ Go to www.michigan.gov/deqwaste
- ✓ Contact the DEQ EAC at 1-800-662-9278
- ✓ Search the DEQ Publication Center
- ✓ Contact DEQ district waste inspection staff
- ✓ Contact hazardous waste vendors
- ✓ Contact waste consultants

“How To” Calculate Hazardous Waste Monthly Inventories

Perform generator calculations on the first day of each month

Add-up the weight of all full hazardous waste containers placed into storage during the previous month (use accumulation date)

Add to the weight of all the waste in satellite containers that are currently accumulating hazardous waste near the point of generation

“How To” Calculate Hazardous Waste Monthly Inventories

Subtract from this amount the weight of the prior month’s satellite containers

That should give the monthly generation rate if there were no shipments directly from the equipment or a satellite accumulation area during the prior month.

Maintaining a running log of waste containers put into service and their contents at the beginning of each month is an easy way to document generation rates.

Strategies to Minimize Generator Status

Hazardous wastes managed using the universal waste standards are not included in the monthly hazardous waste volume for determining generator status and can be used to reduce your generator status –
USE THEM!!!

Strategies to Minimize Generator Status

Use all possible exemptions from Part 111

Use alternate materials that are less toxic

Do not accumulate volumes of hazardous waste that will cause you to be subject to additional regulations

Techniques for Minimizing Monthly Volumes of Hazardous Waste

Do not mix listed hazardous wastes with other waste to minimize hazardous waste volumes

Use materials as long as possible before removing them from equipment

Techniques for Minimizing Monthly Volumes of Hazardous Waste

Confirm all equipment generating hazardous wastes are used/needed or get rid of them (e.g. obsolete degreasing units, paints, etc.)

Bleed-off a portion of the process materials and add an equivalent volume of virgin material for continued operation instead of removing the entire volume of a material

Techniques for Minimizing Monthly Volumes of Hazardous Waste

Reuse materials a second time in a second process/operation without reclaiming

Routinely review product inventories and purge of expired materials

Use less hazardous or non-hazardous materials where possible (e.g. powder versus solvent coatings or aqueous versus solvent cleanser)

Engineer your process to allow for hard piping through approved discharge to the sanitary sewer