

Waste Regulations 101

Jim Ferritto

Hazardous Waste Section

Waste Management and

Radiological Protection Division

ferrittoj@michigan.gov or, 231-876-4454

Waste Regulations 101

Goal of Today's Discussion:

Provide an overview of the types of waste regulated by the state and federal regulations



Waste Regulations 101

Types of Waste:

- Hazardous Wastes
- Solid Wastes
- Liquid Industrial By-Products
- PCB/TSCA Wastes
- Scrap Tires
- Medical Wastes
- Radioactive Waste
- Asbestos

Waste Regulations 101

How Do I Start?

- Identify what wastes are generated at your facility
- Tour your entire facility and inventory all waste streams

Waste Regulations 101

Q: What is a Waste?

A: A waste is any discarded material.

A waste can be a solid, liquid, semisolid, or gaseous material.

Waste Regulations 101

Q: What is a Waste?

A: A waste is any material that cannot be used for its original intended purpose, including materials that are:

- Burned as fuel;
- Accumulated and recycled or reclaimed; or
- Discarded, abandoned or disposed.

Waste Regulations 101

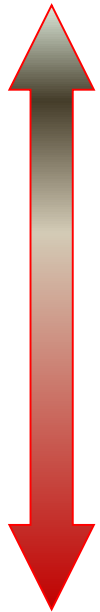
As a general rule of thumb...

...less hazardous waste = less regulation & more disposal options under the law.

There is no one best answer for how to dispose of waste for all businesses & locations.

Waste Regulations 101

Less
Regulation



More
Regulation

Solid Waste

Liquid Industrial By-Products Generators (LIB)

Universal Waste Generators

Conditionally Exempt Small Quantity
Generators (CESQGs)

Small Quantity Generators (SQGs)

Large Quantity Generators (LQGs)



Waste Regulations 101

Hazardous Waste

- Regulated under Part 111 of Act 451
- Applies to waste determined to be a threat to human health or the environment
- Applies to all businesses, including municipalities, hospitals & Service industries, not just manufacturing
- Requires generators characterize all their waste streams

Waste Regulations 101

Waste Characterization

Is the waste *listed* on lists in the hazardous waste rules?

Does the waste exhibit a *characteristic* that makes it hazardous?

- Ignitable
- Corrosive
- Toxic
- Reactive



Waste Regulations 101

Listed Hazardous Wastes

Several different waste classifications prefixed by a letter including:

“F” – hazardous waste from **non-specific sources** (e.g. specific spent halogenated solvents, plating sludges)

“K” – hazardous wastes from **specific industries** (e.g. wood treatment, organic chemical manufacture, petroleum refining)

“P” – discarded **commercial chemical products and spill residues** that are ***ALL acutely*** hazardous wastes (e.g. fluorine, nicotine, toxaphene)

“U” – discarded **commercial chemical products and spill residues** of toxic hazardous wastes (e.g. acetone, benzene, DDT, lindane, methanol)

Waste Regulations 101

Listed Hazardous Wastes

- Listed Hazard Waste Hazard Codes found in rules
- Acutely hazardous wastes are listed with an “H” hazardous code
- Toxic hazardous wastes are listed with a “T” hazard code
- Wastes with a “U” suffix are Michigan-specific hazardous wastes

Waste Regulations 101

Listed Hazardous Waste Codes

Listed Hazardous Waste Code

Hazard Code

Listed In Part 111 Hazardous Waste Rules

R 299.9220 Table 203a; hazardous waste from nonspecific sources.
Rule 220. Table 203a reads as follows:

Table 203a		
EPA Hazardous Waste Number	Hazardous Waste From Nonspecific Sources	Hazard Code
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures and blends used in degreasing containing, before use, a total of 10% or more, by volume, of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane and 1,1,2-trichloroethane; all spent solvent mixtures and blends containing, before use, a total of 10% or more, by volume, of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(T)

Waste Regulations 101

Characteristic Hazardous Waste Types

- Ignitable - D001
- Corrosive - D002
- Reactive - D003
- Toxic - D004 – D043 (Table 201a)
- Severely Toxic – 001S - 007S (Table 202, includes dioxins & furans)

Waste Regulations 101

Characteristic Waste Codes & Common Test

- **Flash point** – Used for testing Ignitability < 140 F or U.S DOT oxidizer (D001) (Examples: paints, solvents)
- **pH** – Used for testing corrosivity ≤ 2 or ≥ 12.5 (D002) (Examples: acids, bases)
- **Reactivity** – Test as required for DOT classification for materials that are unstable at normal conditions, reacts violently with water, explode, and/or emit toxic gas (D003) (Examples: lithium hydride & trichlorosilane)

Waste Regulations 101

Characteristic Waste Codes & Common Test

- **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)

Note: A waste that exhibits severe toxicity is listed in Table 202 of the Part 111 Rules and labeled with the suffix "S".

Waste Regulations 101

Sample Extract Concentration Limit

TCLP Characteristic
Hazardous Waste
Codes

R 299.9217 Table 201a.
Rule 217. Table 201a reads as follows:

Table 201a			
EPA Hazardous Waste Number	Chemical Abstract Services Number	Material	Extract Concentration milligrams per liter
D004	440-38-2	Arsenic	5.0
D005	7440-39-3	Barium	100.0
D018	71-43-2	Benzene	0.5
D006	7440-43-9	Cadmium	1.0
D019	56-23-5	Carbon tetrachloride	0.5
D020	57-74-9	Chlordane	0.03
D021	108-90-7	Chlorobenzene	100.0
D022	67-66-3	Chloroform	6.0
D007	7440-47-3	Chromium	5.0
D023	95-48-7	o-Cresol	200.0**
D024	108-39-4	m-Cresol	200.0**
D025	106-44-5	p-Cresol	200.0**
D026	-----	Cresol	200.0**
D016	94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid)	10.0
D027	106-46-7	1,4-Dichlorobenzene	7.5
D028	107-06-2	1,2-Dichloroethane	0.5
D029	75-35-4	1,1-Dichloroethylene	0.7
D030	121-14-2	2,4-Dinitrotoluene	0.13*
D012	72-20-8	Endrin (1,2,3,4,10,10-hexachloro-1,7-Epoxy-1,4,4a,5,6,7,8,8a octahydro-1,4-endo, endo-5,8-dimethano naphthalene)	0.02

Listed In Part 111
Hazardous Waste Rules

Waste Regulations 101

Once the hazardous wastes have been identified, check for exemptions or exclusions!

Common Exemptions & Exclusions

- Wastewater discharges to Part 31 permitted POTW's that are **approved** by that sewer authority are exempted at the point of discharge to the sewer



Waste Regulations 101

Common Exemptions & Exclusions

- Batteries, pesticides, mercury devices, electric lamps, pharmaceuticals, consumer electronics & antifreeze handled as universal waste enjoy a **partial** exemption



Common Exemptions & Exclusions

- Used oils that are recycled
- 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 of Act 451
- Off-specification fuel (gas, kerosene, diesel, etc.) being recycled into fuel or burned as fuel

Waste Regulations 101

Common 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 Regulations 101

Common Exemptions & Exclusions

- Household waste, including single & multiple residences, hotels & motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, & day-use recreational areas



Waste Regulations 101

Common Exemptions & Exclusions

Conditionally Exempt Small Quantity Generator:

- Monthly hazardous waste generation < 220 lbs. or ~ 1/2 drum non-acute and < 2.2 lbs. acute
- Total hazardous waste accumulation ALWAYS be less than 2200 pounds (5 drums) non-acute and < 2.2 lbs. acute
- Wastes are properly disposed under other regulations

Waste Characterization Record

To meet the waste characterization recordkeeping requirements of Rule 307 (MAC R 299.9307), consider creating a record that details your answers to the waste characterization questions provided below. This detail would ensure thorough documentation of your determination and would be in addition to the following records that should already be assembled and available at the site of generation for each waste stream requiring review:

- the waste type
- a narrative description of the waste
- the source of waste
- any test results obtained from sampling and analyzing the waste
- a description of the sampling procedure used
- details on how the sample was determined to be representative of the waste stream
- a copy of Safety Data Sheets (SDS) or other reference materials relied upon for making the waste determination, including calculations used to evaluate subpart BB and CC applicability (to determine the ppmv volatile organic compound content of the waste)

Waste Characterization
Basic 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 an exclusion or exemption apply?
4. Do other regulations apply? (Liquid Industrial or solid waste, etc.).
5. Create & maintain records of characterization for at least 3 years from the date waste was last shipped offsite.
6. Re-characterize if there is a change in process or materials.



Waste Characterization Questions

The questions below do not address radioactive waste, infectious or pathogenic medical waste, or Toxic Substance Control Act applicability. Consult with a specialist on these topics if you have a waste that may be subject to these regulations. To locate assistance on these topics, contact the Environmental Assistance Center at 1-800-862-9278 or deq-assist@michigan.gov. When reviewing each question, advance to the next question if you answer NO.

Listed Hazardous Waste Review

1. Is this an unused raw material chemical product containing a sole active ingredient?
If Yes: Is there a SDS available?
If Yes: Is material a commercial chemical product listed in Part 111 Table 205a, 205b, or 205c (P or U Listed)?
If Yes = Waste is a listed hazardous waste, advance to listed waste exclusion review.
2. Does the waste contain spent solvents or is it a wastewater treatment waste not discharged directly to the wastewater treatment plant pursuant to a permit issued by the treatment authority (F Listed)?
If Yes: Does the spent solvent or process generating the waste make the waste a hazardous waste, by definition because it is listed in Part 111, Table 203a?
If Yes = Waste is a listed hazardous waste, advance to listed waste exclusion review.
3. Does the process generating the waste make the waste a hazardous waste, by definition because the process waste is listed in Part 111 Table 204a (K Listed)?
If Yes = Waste is a listed hazardous waste, advance to listed waste exclusion review.

Listed Hazardous Waste Exclusion Review

Do any Part 111 exclusions or exemptions apply?
If Yes: Specify the exclusion found in Rule 202 (waste), Rule 203 (hazardous waste) 204 (exclusion), Rule 205 (CESQG), Rule 206 (recyclable material), Rule 228 (universal waste), etc. and include any relevant documentation substantiating the exclusion applicability in your waste characterization record, then advance to question 4 to determine if waste exhibits any characteristics that make it a hazardous waste.
If No – Waste remains a listed hazardous waste that must be managed using the listed hazardous waste code(s). Continue to step 4 if desiring to identify the hazardous waste characteristics that apply.

Waste Characterization Record

Completed by:

Completion date:

Waste description:

Waste source:

Waste type:

Waste codes:

Waste sample details including date sampled, location(s) sampled, collection procedure, analysis method, etc.):

Product name for SDS considered:

Subpart BB or CC applicability:

LDR underlying hazardous constituents:

Listed Review

1. Is this an unused raw material that is commercial chemical product listed in Part 111 Table 205a, 205b, or 205c (P or U listed)?
2. Does the waste contain spent solvents that meets the listing in Table 203a or is the waste a wastewater treatment sludge meeting the listing in Table 203a (F listed)?
3. Does the process generating the waste make the waste a hazardous waste, by definition because the process waste is listed in Part 111 Table 204a (K listed)?

Listed Waste Exclusion Review - List any exclusion relied upon to exclude waste from hazardous waste regulation (e.g. continued use).

Hazardous Waste Generator Status

Determined by:

- Total quantity of hazardous waste generated each calendar month AND
- The amount of hazardous waste accumulated at any one time

This information is used to determine the handling & disposal requirements for the waste!!!

Hazardous Waste Generator Status

When determining your monthly generator status don't count:

- Waste excluded from definition of hazardous waste (e.g. recycled scrap metal, recycled fuel, POTW permitted disposal)
- Universal waste
- Used oil
- Empty containers
- Liquid industrial by-product

Waste Regulations 101

Hazardous Waste Generator Status

	CESQG	SOQ	LQG
Amount of <i>acute</i> or <i>severely toxic</i> haz waste <u>generated or accumulated</u> at any time.	1 kg. (2.2 lbs.) or less	1 kg. (2.2 lbs.) or less	>1 kg. (2.2 lbs.)
Amount of <i>acute spill residue</i> or cont. soil <u>generated or accumulated</u> at any time	100 kgs.(220 lbs.) or less	100 kgs. (220 lbs.) or less	>100 kgs. (220 lbs.)
Amount of <i>non-acute</i> haz waste <u>generated</u> in 1 calendar month.	100 kg. (220 lbs.) or less	>100 kg. (220 lbs.) but <1000 kg (2200 lbs.)	>1000 kg. (2200 lbs.)

Waste Regulations 101

Hazardous Waste Generator Status

	CESQG	SQG	LQG
Approx. volume of <i>non-acute</i> hazardous waste <u>generated</u> in 1 calendar month.	25 gallons (assuming the liquid weight equals that of water)	25 to 250 gallons	250 gallons and greater
Max amount of non-acute hazardous waste that can be <u>accumulated</u> on site at any time.	1000 kg (2200 lbs.)	6000 kg (13,200 lbs.)	No maximum amount
Max time period before waste must be shipped.	No time limit if never exceeding 2200 lbs.	180 days unless shipped over 220 miles; then 270 days	90 days

Waste Regulations 101

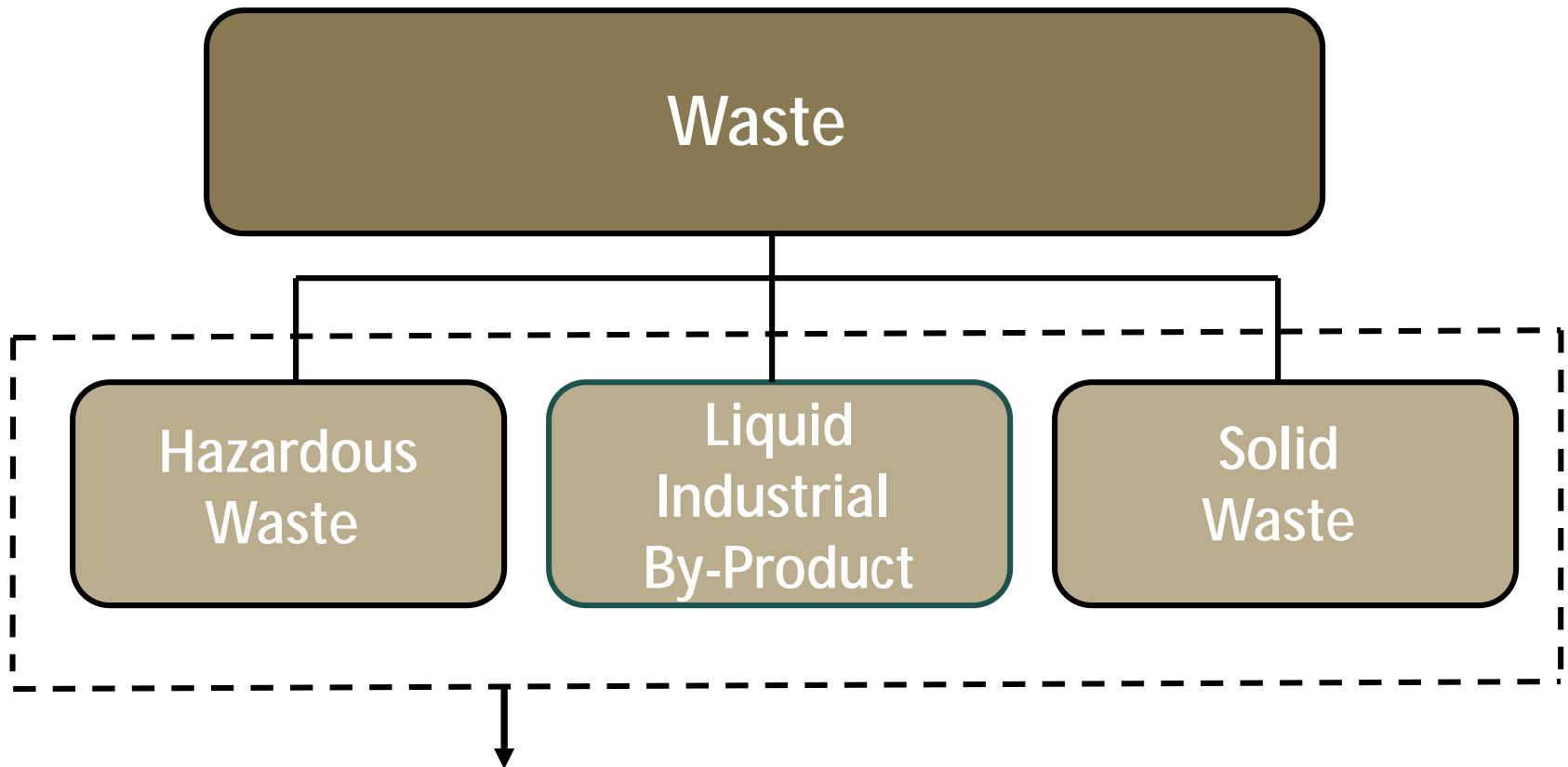
Hazardous Waste Generator Requirements

See Chapter 2, Table 2.6 (page 2-50) in the guidebook online at www.michigan.gov/ehsguide

SECTION ONE: Environmental Regulations

TABLE 2.6 Summary of the Hazardous Waste Generator Requirements

Summary Topic	Conditionally Exempt Small Quantity Generator (CESQG)	Small Quantity Generator (SQG)	Large Quantity Generator (LQG)
Waste Characterization	Records of waste characterization required for all businesses generating waste (Chapter 2.4.2). Keep records at least 3 years from date waste was last sent for on or off-site treatment, storage, or disposal.		
Generator Status Determination	Records of monthly generator status determinations required for all businesses generating hazardous waste (Chapter 2.4.3). Keep records at least 3 years from date hazardous waste was last sent for on or off-site treatment, storage, or disposal.		
Off-site Treatment, Storage or Disposal Destination for	Licensed solid waste disposal facility (solids); Liquid industrial by-product designated facility (liquids); licensed or exempt recycler; or licensed hazardous waste facility. Also, universal waste handler or universal waste	Licensed hazardous waste facility; or exempt hazardous waste recycling facility. Also, universal waste handler or universal waste destination facility for hazardous waste	Licensed hazardous waste facility; or exempt hazardous waste recycling facility. Also, universal waste handler or universal waste destination facility for hazardous



Subject unless excluded:

- Hazardous waste if listed or characteristic
- Liquid industrial by-product if free liquids/sludge
- Solid waste if solid

Waste Regulations 101

Liquid Industrial By-products

- Regulated under Part 121 of Act 451
- Formally known as Liquid Industrial Waste
- Determined by using the Paint Filter Test, EPA Method 9095 of SW-846
- If there are any free liquids in the waste it should be managed as a liquid industrial by-product

Waste Regulations 101

Liquid Industrial By-product Examples

- Liquid CESQG hazardous waste
- Liquid waste that is not a listed or characteristic hazardous waste such as:
 - Used oil
 - Antifreeze
 - Wastewaters
 - Fats, Oils, & Grease
 - Catch Basin Clean-Out
 - Recycled Fuel
 - Stormwater Cleanouts
 - Brine

Waste Regulations 101

Liquid Industrial By-products Requirements

- Requires waste characterization in accordance with Part 111
- Requires liquid industrial by-products be managed in non-leaking tanks or containers in good condition, kept closed except to add or remove waste
- Requires labeling or marking of containers and tanks to identify their contents
- Requires documents be maintained for at least 3 years

Waste Regulations 101

Liquid Industrial By-products Requirements

- Requires use of a DEQ permitted, registered, and insured liquid industrial by-products transporter
- Requires transporters to carry registrations and permits in paper or electronic format during transport
- Requires designated facilities maintain a plan to respond to releases
- Requires designated facilities document proper employee training

Waste Regulations 101

Liquid Industrial By-products Requirements

- Requires designated facilities receiving liquid industrial by-products from off-site to report prior calendar year's activities annually by April 30th
- For more information, see:
 - Liquid Industrial By-products Designated Facility Requirements session at 2:30
 - Recorded webinar online at www.michigan.gov/deqwaste under the "Announcements" tab

Waste Regulations 101

Solid Waste

- Regulated under Part 115 of Act 451
- If the waste meets a hazardous waste exemptions or exclusions, it is subject to non-hazardous solid waste regulation
- Solid waste must be disposed in a Type II Municipal Solid Waste Landfill or a permitted Municipal Solid Waste Incinerator unless it is recycled or diverted

Waste Regulations 101

Landfill Prohibited Materials

- Used Oil
- Liquid Waste
- Lead Acid Batteries
- Hazardous Waste from SQG & LQG
- Low Level Radioactive Waste
- PCB Waste
- Medical Waste
- Empty Drums
- Whole Tires
- Returnable Beverage Containers
- Sewage
- Asbestos (unless landfill approved)

Waste Regulations 101

Solid Waste Recycling Exemptions

- Concrete Grinding Slurry
- Ethanol
- Lime Sludge
- Manure, Paunch and Pen Waste
- Backyard Composting
- Gypsum Drywall
- Fish Waste
- Scrap Wood



Waste Regulations 101

Inert Materials

- Regulated by Part 115 of Act 451
- Inert means there are no listed hazardous wastes or hazardous substances present in a waste at concentrations above current Part 201 cleanup criteria
- Inert materials can include dredged spoils, excavated soils, cement kiln dust, asphalt, certain construction materials, rock, etc.
- Inert materials can be used as alternate daily cover in landfills with DEQ approval

Toxic Substances Control Act (TSCA)

- TSCA is implemented by EPA
- TSCA applies to the manufacture, processing, distribution, marking, use, storage, cleanup, and disposal of PCB containing wastes (e.g. dielectric fluids, heat transfer fluids, capacitors, hydraulic fluids containing PCBs)
- 3 action levels for total PCB concentrations:
 - less than 50 ppm
 - 50 ppm to less than 500 ppm
 - equal to and greater than 500 ppm

Waste Regulations 101

Toxic Substances Control Act

- Depending on PCB concentration, some PCB containing waste must be shipped on a uniform manifest and disposed at a TSCA authorized disposal facility
- See Chapter 4 for details on TSCA PCB requirements
- See PCB experts in the assistance area
- Contact EPA Region 5 at 312-886-7890, 800-621-8431, or 213-353-2318, or www.epa.gov/pcb

Waste Regulations 101

Scrap Tires

- Regulated under Part 169 of Act 451
- Requirements for scrap tire generators include:
 - Store tires in a safe manner and the location of generation
 - Ensure scrap tires are taken to a registered tire collection site
 - Haulers must register annually
 - Obtain and keep copies of scrap tire manifests.
- Additional information is available through the DEQ's Scrap Tire Program at 517-241-2924, 517-284-6588, or www.michigan.gov/scrap tires

Waste Regulations 101

Medical Waste

- Regulated under Part 138 of Act 368
- Medical waste includes waste that may be infectious to humans and animals like:
 - liquid human and animal blood and body fluid wastes
 - biological production wastes
 - cultures of infectious agents including lab wastes,
 - pathological wastes
 - sharps such as needles, scalpels, and intravenous tubing

Waste Regulations 101

Medical Wastes

- Many agencies regulate medical waste, including:
 - **DEQ** – regulates how generators must handle their medical waste from point of generation to disposal
 - **EPA** – has requirements for land disposal and incineration
 - **DOT** – regulates packaging, labeling, shipping, and transportation
 - **MIOSHA** – regulates handling of bloodborne infection diseases for worker exposure protection
- Additional information is available by calling the DEQ's Medical Waste Program at 517-284-6590, 517-284-6594, or www.michigan.gov/deqmedwaste.

Waste Regulations 101

Radioactive Wastes

- Includes naturally occurring and/or accelerator-produced radioactive material (NARM) and low-level mixed waste (LLMW)
- Subject to Rule 823 of Part 111
- NARM and LLMW wastes are *possibly* exempt from the definition of hazardous waste if certain conditions apply, such as if it meets the acceptance criteria of a low-level radioactive waste disposal facility or eligible NARM waste
- NARM and LLMW waste must meet or be treated to meet LDR treatment standards

Waste Regulations 101

Asbestos

- Used in more than 3000 products over the past 100 years for its insulation and fire protective properties
- Common products include pipe insulation, floor and ceiling tiles, and electrical appliance insulation
- Found in a wide range of settings including industrial and manufacturing, school and universities, and residential properties

Waste Regulations 101

Asbestos

- Generally disposed in Type II Municipal Solid Waste landfill approved to accept asbestos-containing wastes under TSCA
- Disposal regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) by DEQ, AQD Asbestos program
- Asbestos is the general name of a group of minerals with a similar propensity to become airborne and cause damage to lungs like Chrysotile, Amosite, and Crocidolite.
- Additional information about notification, handling, and disposal is available through the DEQ, AQD, NESHAPs Asbestos Coordinator at 517-373-7064

Waste Regulations 101

Thank you!

If you have any specific questions, please feel free to contact me.

Jim Ferritto
231-876-4454, or,
ferrittoj@michigan.gov