What is Hazardous Waste?
- Solid waste that may:
  - Cause or significantly contribute to an increase in mortality or increase in serious illness
  - Pose a substantial hazard to human health or the environment when improperly managed

What is a Hazardous Waste
- Exhibits one of the 4 characteristics
  - catches fire, corrodes metals, unstable, harmful when ingested or absorbed
- Listed on one of the 4 lists
  - Over 400 wastes that are harmful to human health or environment

Hazardous Waste Characteristics
- Characteristics
  1. Ignitable - D001
  2. Corrosive - D002
  3. Reactive - D003
  4. Toxic - D004 - D043

Hazardous Waste Lists
- Lists
  1. F-List - non-specific source waste
  2. K-List - specific source waste
  3. P-List - commercial chemical products (acutely hazardous)
  4. U-List - commercial chemical product (hazardous)

Hazardous Waste Examples
- Solvent Blend 1
  - Acetone 5%
  - Toluene 10%
  - Mineral Spirits 85%
- Solvent Blend 2
  - Acetone 4%
  - Toluene 8%
  - Naphtha 88%
Hazardous Waste Examples

- Solvent Blend 3
  - Methyl Ethyl Ketone (MEK) 8%
  - Acetone 4%
  - Tetrachloroethylene 3%
  - Mineral Spirits 85%
- Paint
  - Acetone 20%
  - Methyl Ethyl Ketone (MEK) 30%
  - Naptha 30%
  - Pigments 20%

Example: A Chemical Which Has a Different Hazardous Waste ID Upon Becoming a Waste

<table>
<thead>
<tr>
<th>Industry/EPA Hazardous Waste #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F001</td>
<td>Trichloroethylene (and some other spent halogenated hydrocarbons) used in degreasing operations</td>
</tr>
<tr>
<td>F002</td>
<td>Trichloroethylene (and some other spent halogenated hydrocarbons)</td>
</tr>
<tr>
<td>U22B</td>
<td>Trichloroethylene (commercial chemical product)</td>
</tr>
<tr>
<td>D040</td>
<td>A waste containing trichloroethylene in excess of TCLP value</td>
</tr>
</tbody>
</table>

Solid and Hazardous Waste Exclusions

1. Solid Waste Exclusions 40 CFR 261.4(a)
   - e.g. shredded circuit boards being recycled
2. Hazardous Waste Exclusions 40 CFR 261.4(b)
   - e.g. arsenic treated wood waste
3. Sample Exclusions 40 CFR 261.4(d), (e), (f)

Hazardous Waste Determination

- Is it a Solid Waste?
  - YES
  - NO
- Is it Exempted or Excluded?
  - YES
  - NO
- Is it Listed or does it exhibit a characteristic?
  - NO
  - YES
- Is it a Used Oil or Universal Waste?
  - NO
  - YES

Subject to RCRA
- Parts 262-268
- Subject to RCRA Parts 273 or 279

EPA HazWaste Generator Rules

Rules are based on the amount of hazardous waste generated per month, in kilograms

(1 kilogram = 2.2 pounds)

EPA HazWaste Generator Rules

“Conditionally Exempt Small Quantity Generator” ... no more than 220 lbs and no more than 2 lbs of acutely hazardous waste generated per month.
EPA HazWaste Generator Rules

“Small Quantity Generator” …

between 220 and 2,200 lbs of hazardous waste and no more than 2 lbs of acutely hazardous waste per month.

Large Quantity Generator (LQG) of Hazardous Waste

- 1,000 kg (~2,200 lbs) per month
- 1 kg (~2.2 lbs) of acutely hazardous waste

CESQG Requirements (40 CFR 261.5)

- Minimal Requirements
  - Determine which wastes are hazardous
  - Generate less than 220 lbs per month
  - Generate less than 2 lbs acutely hazardous waste per month
  - Have no more than 2,200 lbs on site at any one time
  - Ensure delivery of waste to appropriate treatment, storage or disposal facility

Management Requirements for SQG and LQG

- 40 CFR 262
  - General Requirements
  - Pre-transportation Requirements
  - Manifest Requirements
  - Recordkeeping and Reporting Requirements
  - 90 day storage limitation for LQGs
- 40 CFR 262.34 for SQGs
  - Never have more than 13,200 lbs on site
  - Never keep waste onsite for more than 180 days

Accumulation Requirements

- Container and Tank requirements
  - Marked with the words “hazardous waste” and start date of accumulation
  - “good condition” and compatible
  - Closed, except when adding or removing waste
  - Inspected weekly for containers (daily for tanks)
  - 50 feet from property boundary (for LQGs only)
  - Air Emission standards (for LQGs only)

Preparedness and Prevention

- Evaluate and minimize the threat of fire, explosion, or release of hazardous waste
- Emergency Communication systems (internal and external)
- Appropriate water, fire control and spill and decontamination equipment
- Adequate aisle space for emergency response
- Large Quantity Generators must also have a complete Contingency Plan
Additional Requirements for SQGs

- **Posted Information**
  - Name and phone number of emergency coordinator
  - Location of emergency and spill equipment
  - Telephone number of the fire department

- **Training**
  - “Thoroughly familiar with proper waste handling and emergency procedures”

Recordkeeping and Reporting

- **3 Primary Requirements**
  - Biennial Reports for LQGs
  - Exception Reports
    - 45 days for LQGs
    - 60 days for SQGs
  - Recordkeeping
    - Manifests
    - Biennial Reports and Exception Reports
    - Waste Analysis, test results or other waste determinations

Shipping Hazardous Waste Off-Site

- Choose a transporter and TSD facility which have EPA identification numbers and are reputable
- Package and label wastes for shipping according to DOT
- Prepare a Uniform Hazardous Waste Manifest (EPA Form 8700-22)
- Comply with Land Disposal Restrictions

Off-Site Shipments

Comply with all applicable DOT Regulations
49 CFR

What are they?

Proper Containers

- UN approved containers
- Can reuse containers for hazardous waste shipments

Marking

- Proper Shipping name
- UN Identification Number
- Technical Name (if required)
- Generators name and address
- Manifest Document number
- Hazardous Waste Warning
- Liquids require packaging orientation arrows
Labeling

- Near the Proper Shipping Name
- On Background of Contrasting Color
- Unobscured by Markings
- Two or more labels must be near each other

Shipping Papers

- Use Hazardous Waste Manifest
  - Unique, preprinted tracking number
  - Only registered printers may distribute them
  - All fields are mandatory
- Proper Description
  - Hazardous Materials Table (172.101)
- Land Disposal Restrictions
  - Notification or certification
- Emergency Information
  - MSDS, Emergency Response Guidebook, etc.

Universal Wastes

- May 11, 1995 (60 FR 25492)
- 40 CFR 273
- New rules for
  - Hazardous waste batteries
  - Hazardous waste pesticides
  - Mercury containing thermostats
- Lights containing mercury added July 6, 1999 (64 FR 36466)

What are Universal Wastes

- Batteries
- Recalled stocks of suspended or cancelled pesticides
- Mercury containing Thermostats (temperature control devices)
- Mercury containing Lights

Universal Waste Rules

- Exempt from some hazardous waste rules, but subject to the requirements of Part 273
- Streamlined standards for:
  - Storing
  - Labeling and marking
  - Preparing shipments for transportation
  - Employee training
  - Responses to releases
Universal Waste

- Handlers
  - Small Quantity Handler
  - Large Quantity Handler
- Consolidation Points
- Transporters
- Destination Facility

Performance Standard

- “Manage universal wastes in a way that prevents releases of any universal waste or component of a universal waste to the environment.”

Management Standards

- No Leaking Containers
- Proper Labeling & Marking
  - “Universal Waste” - Batteries
  - “Waste” Batteries
  - “Used” Batteries

Accumulation Time

- Up to 1 year
- Start Date marked on container
- Longer periods possible, if not economical

Training

- “Thoroughly Familiar with proper waste Handling and emergency response procedures”
- Handle releases as if a hazardous waste
  - Conduct waste determination on release

Shipments

- Determine if DOT Hazardous Material
- Large Quantity Handlers must track shipments
- Keep records for at least 3 years
Prohibitions
- Diluting or Disposing of Universal Waste
- Treating Wastes (except during emergency response)
- Sending universal wastes to place other than consolidation point or destination facility

Hazardous Materials Transportation

Modes of Transportation

Compliance Process
- Identify and classify
- How dangerous is it?
- Give it a name
- Select a package
- Mark and label the package
- Prepare a document
- Provide Emergency Response info

Hazardous Material Table

Column 2 Proper Shipping Name

- Listed Alphabetically
  - Chemical Names
  - Chemical Family
  - By Use
  - Hazard Class
  - Other
- Italics
- See
- Singular/Plural
- n.o.s.

49 CFR 172.101
- Listed alphabetically by proper shipping name
- Hazardous Substances (appendix A)
HMT

- Column 1 Symbols
- Column 2 Proper Shipping Name
- Column 3 Hazard Class
- Column 4 UN Identification Number
- Column 5 Packing Group
- Column 6 Labeling Requirements
- Column 7 Special Provisions
- Column 8 Exemptions and Packaging

172.101 Appendix A

- Hazardous Substances
  - Is it Listed in Appendix A?
  - Does it Equal or Exceed the Reportable Quantity per package?

Hazard Classes

- 1 Explosives
- 2 Gases
- 3 Flammable Liquids
- 4 Flammable Solids
- 5 Oxidizers
- 6 Toxic Materials
- 7 Radioactive
- 8 Corrosive Materials
- 9 Miscellaneous

Part 173 Subpart D

Packing Group

- PG I = Great Danger
- PG II = Medium Danger
- PG III = Minor Danger

- Indicates the “degree of danger”
- Classes 2, 7, Division 6.2 and ORM-D do not have packing groups

Small Quantity Exception

- Some Hazard Classes
- Maximum Quantity per inner container
  - 30 ml or 30 g
- Gross mass of package not to exceed 64 pounds
- Mark package with “This package conforms to 49 CFR 173.4”

Materials of Trade

- Materials not subject to DOT requirements other than 173.6
- Limited to specific Classes and Divisions
- Gross mass limited depending upon Packing Group
  - PG I – 1 lb or 1 pt
  - PG II or III – 66 lbs or 8 gallons
- Packaging requirements
- Hazard Communication
- Aggregate Gross Weight of all not to exceed 440 lbs
SelectAuthorizedPackage

Go to 49 CFR 173.***

UN Marking

4G/Y29 Gross Mass

Marking

- Proper Shipping name
- Identification Number
- Technical Name (if Required)
- Shipper’s name and address
- Liquids require packaging orientation arrows

General Labeling for Non-Bulk Packaging

- Column 6
- Primary and Subsidiary Hazards

Flammable liquid, toxic, n.o.s. (Toluene, chlorothalanil) UN1992

Prepare Documentation

- the “basic description”
- the required sequence
- responsibility of the shipper
Shipping Papers

- Must be retained for 2 years
- No specific format unless hazardous waste
- Must accurately describe material

Shipper’s Certification

“This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.”
- Signature required
- Air requirement
  “I declare that all of the applicable air transport requirements have been met.”

Emergency Information

- Emergency Response Telephone #
  - Monitored at all times by Qualified person
  - of Shipper or Other Qualified Organization
- Basic Description, Health hazards, Risks, Immediate precautions, Fire fighting info, Spill/Leak info, First Aid
- Must be on shipping papers or attached to shipping papers

Air Shipments

- Requirements for shipping by air more stringent than by ground
- Need to use List of Dangerous Goods
  - Chapter 4 of IATA Dangerous Goods Regulations
- Lists quantity limitations for cargo and passenger aircrafts

Packing Instructions

- Chapter 5
- Select package
- General packaging requirements (5.0.2)
- Do not forget to check any Operator Variations (what airline or carrier are you using)

Marking and Labeling

- Chapter 7
  - UN Identification Number, Proper Shipping Name
  - Name and Address of the shipper and consignee
  - Cargo Aircraft Only
Shippers Declaration

- Chapter 8 Documentation
- Shippers Declaration for Dangerous Goods and Air Waybill

Security

- Security Awareness Training
- All hazmat employees
- Security Plan
- Required facilities