

# RCRA Compliance at Cleanup Sites: Waste Characterization & Listed Hazardous Waste

A NEWMOA Waste Site Cleanup Group  
Webinar



October 24, 2019  
10:00 - 11:30 a.m.

# Remediation Waste Characterization: Applicable Laws & Regulations

- Hazardous Waste Regulations.
  - Federal.
  - State (vary from state to state).
- Solid Waste/Special Waste Regulations & Statutes.
  - Vary from state to state.
- Remediation Standard Regulations.
  - Most of the NEWMOA States have them.
  - 3 NEWMOA States license environmental professionals - (CT, MA, NJ).



# Topics for Today's Webinar

- Generator Responsibilities.
- Point of Generation.
- Hazardous Waste Determinations.
- Characteristic hazardous waste.
- Listed Hazardous Waste.
- “Contained-in” principle.
- Non-hazardous waste management requirements.
- Examples/Case Studies.
- Waste characterization as part of overall project management.



# Responsibilities of the Generator



- Fully and properly characterize the waste.
  - Ultimately the responsibility of the generator.
  - Not the transporter, disposal facility, consultants, etc.
- If the waste is hazardous, manage it in accordance with all applicable hazardous waste requirements.
- “Co-generators” are jointly and severally liable for compliance with generator requirements.
  - Property owner or operator (e.g., lessee).
  - Remediation consultant (e.g., LSP, LEP, etc.).
  - Remediation contractor(s).

# Point of Generation



- General Principle: A waste that is placed into storage or disposal prior to the effective date of RCRA is not a waste until it is removed from storage or disposal. As a result:
  - Environmental “media” that was contaminated with hazardous waste before the effective date of RCRA is not hazardous waste as long as it is in the ground.
  - Once media is removed from the ground (e.g., dug up or pumped out), it is “generated” and becomes a waste. If characteristic or listed, the media would be a hazardous waste.
  - In addition to media, this principle also applies to other wastes such as buried drums, abandoned tanks, sludge in surface impoundments, etc. (They are generated as wastes when removed from the ground.)

# Point of Generation (Cont.)



- This principle does not apply to environmental media that was contaminated with hazardous waste after the effective date of RCRA.
- “Effective date of RCRA” is 11/19/1980 for most wastes.
  - Could be later for wastes that were added to the definition of HW after 11/19/1980.
  - Example: TCLP VOCs and SVOCs (added 3/29/1990).
- Compliance with HW requirements must occur beginning at the point of generation.
  - Not when test results come back.

# Hazardous Waste Determinations



- A generator must determine if a waste is HW. [40 CFR 262.11]
- This is required at the point of generation.
  - Is it a characteristically hazardous?
  - Is it a listed hazardous waste?
  - Is it a State-listed hazardous waste?
  - Which EPA waste codes apply?
  - Acute vs. non-acute hazardous waste.
- Can be performed by:
  - Testing, or
  - “Knowledge of Process” (must be valid).

# Hazardous Waste Determinations (Cont.)



- Process can (and should) also be used for LDR purposes (Underlying Hazardous Constituents).
- Handling “unknowns.”
  - Examples:
    - Unmarked drums or uncontained wastes found at a cleanup site.
    - Drums of drill cutting spoils, groundwater, etc. generated during site investigations.
  - If possible, characterize before the point of generation.
  - If not possible: containerize (if needed), sample, mark “HW Pending Analysis,” and manage as HW until results come back.



# Characteristic Hazardous Waste

- Characteristic Hazardous Waste - waste that is hazardous by virtue of a physical property that it exhibits:
  - Ignitability (D001): liquids with a flash point < 140, ignitable solids, ignitable compressed gases, DOT oxidizers.
  - Corrosivity (D002): pH  $\leq$  2.0 or  $\geq$  12.5.
  - Reactivity (D003): react with water, explosives, some cyanide and sulfide bearing wastes.
  - Toxicity (D004 - D043): fail TCLP test for one or more specific constituents:
    - These include 8 metals, 10 VOCs, 14 SVOCs, and 8 pesticides & herbicides.



# Characteristic Hazardous Waste - Media



- Contaminated environmental media containing these wastes is only hazardous if it exhibits a characteristic (after the point of generation).
- “Media” = soil, groundwater, or sediment.
- Resources:
  - [Managing Remediation Waste Under RCRA](#) (EPA)
  - [HW Characteristics - A User-Friendly Reference Document](#) (EPA)
  - [RCRA Online](#) (EPA Database of Regulatory Interpretations)
  - State Environmental Agency website HW pages.

# Characteristic Hazardous Waste - Media



- Definition of Ignitability, Corrosivity, and Reactivity will often rule out media being HW:
  - Solid ~ liquid makes ignitability and corrosivity unlikely.
  - Does not exhibit the properties that make the waste hazardous.
  - Caution: even if not HW, may still be subject to LDRs.
- Most common characteristic for media is toxicity.
  - Must use TLCP (not SPLP).

# Listed Hazardous Waste



- Listed Hazardous Waste - waste that meets a specific material/process definition or “listing.”
- Includes the following types of listed waste:
  - Wastes from non-specific sources (F-listed).
  - Wastes from specific sources (K-listed).
  - Commercial Chemical Product Wastes (U- and P-listed).
    - U-listed: not acute hazardous wastes.
    - P-listed: acute hazardous wastes.
  - State-specific listed wastes in some NEWMOA states (check state HW Regs).

# Listed Hazardous Waste: Non-Specific Sources (F001 - F039)



- Listed Spent Solvents (F001 - F005).
  - Common examples: TCE, PCE, 1,1,1-TCA, MeCl<sub>2</sub>, MEK, toluene, xylene.
- Metal Finishing Wastes (F006 - F019).
  - Common examples: WWT sludges, plating/stripping/quenching baths.
- Other F wastes not very common.
- Making F-listed determinations can be tricky.
  - Listing definitions are very specific (need to read them carefully).
  - Applicability of F001 - F005 listings to solvent blends.
  - Definition of “electroplating” in F006.

# Listed Hazardous Waste: Specific Sources (K001 - K181)



- Industry, process and chemical-specific.
- Some of the more common K-listed wastes:
  - K061 steel mill flue dust.
  - K062 spent pickle liquor from steel finishing operations.
- The rest are not very common.
- Not as tricky as the F-listings (very specific).

# Listed Hazardous Waste: Commercial Chemical Products



- Commercial Chemical Products (U- and P-listings):
  - Discarded commercial chemical products and manufacturing chemical intermediates in the U or P lists.
  - Spill & Container Residues of Commercial Chemical Products.
- Must be unused.
- Must be the commercially pure grade of the chemical, or a product which contains the chemical as the “sole active ingredient.”
- P-listed waste are acute hazardous wastes.

# Listed Hazardous Waste: Contained-In Principle

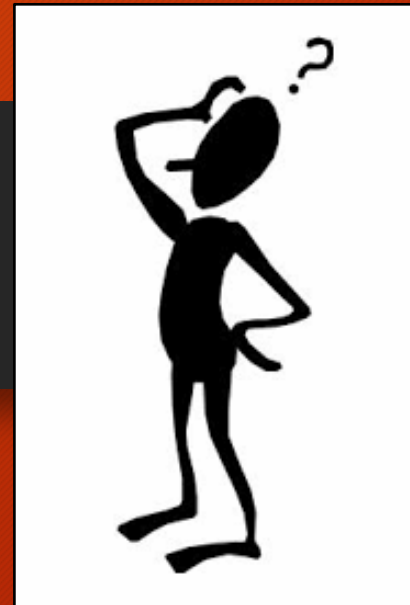


- “Contained-in” Principle:
  - Contaminated environmental media that contains a listed HW is regulated as a listed hazardous waste (after the point of generation).
- Applies only to listed HW (not characteristic HW).
- Examples:
  - Soil contaminated with electroplating wastewater sludges (F006).
  - GW contaminated with spent PCE dry cleaning solvent (F002).
  - Sediment contaminated by a release from a tank of virgin xylene (U239).



# Contained-In Principle - Importance of Date

- What if you don't know what the source of the contaminant was?
  - If, after good faith efforts to determine whether or not the source contaminant is listed, documentation is unavailable or is inconclusive, it is not necessary to assume that it is listed.
- What if you don't know when the contamination happened?
  - Similar approach.
  - If, after good faith efforts to determine date of contamination, you are unable to do so because documentation is unavailable or inconclusive, it is not necessary to assume that the contamination is listed.



# Resources for Determining Listed Waste Codes

- Manifest data.
  - Manifests could be obtained from the property owner or operator (e.g., lessee).
  - State or federal databases.
  - Caution: not all HW Codes may be listed on the manifest.
- State/federal agency inspection reports (HW, Water, Air).
- Company records, interviews of former employees.
- Site visit.
- Town records.
- EPA [Guidance Document](#) and [Web Page](#).



# Hazardous Waste Exemptions Part 1



- Characteristic sludges, byproducts, and CCPs being reclaimed - 40 CFR 261.2(c)(3).
- “Fuel to fuel” exemption - 40 CFR 261.2(c)(2)(ii).
- Domestic sewer and point-source discharge exemptions (only applies to discharges subject to the CWA) - 40 CFR 261.4(a)(1) and (2).
- Household Hazardous Waste - 40 CFR 261.4(b)(1).
- Ash, etc. from combustion of fossil fuels - 40 CFR 261.4(b)(4).

# Hazardous Waste Exemptions Part 2



- Petroleum contaminated media and debris from UST cleanups conducted pursuant to 40 CFR 280 - 40 CFR 261.4(b)10).
- Samples of waste, water, soil, or air (only applies during collection, transportation and sampling) - 40 CFR 261.4(d).
- Scrap metal (no liquids) - 261.6(a)(3)(ii).
- Empty Containers - 40 CFR 261.7.
  - (1) Remove liquids AND (2) < 3% by wt. (or 3 inches) of residue.
  - Different for acute hazardous wastes (must triple rinse).

# Hazardous Waste Exemptions Part 3



- Wastes reclaimed for significant amounts of precious metals (partial exemption) - 40 CFR 266.70.
- Hazardous wastes that are recycled (partial exemption) - 40 CFR 261.6(b) and (c).
  - Recycling does not automatically mean the waste is exempt!
- Wastes subject to special requirements:
  - Used Oil (includes “materials containing or otherwise contaminated with used oil”) - 40 CFR 279.
  - Universal Waste - 40 CFR 273:
    - Batteries, certain pesticides, mercury-containing equipment, fluorescent lamps, other state-specific wastes (e.g., used electronics in CT).

# Solid Waste/Special Waste/Use as Fill



- Even if contaminated soil or sediment is not hazardous, it may still be regulated as a solid waste.
- Some states classify it as a “special waste.”
- Disposal facility may require a state permit. Examples:
  - Landfill.
  - Soil burner facility.
- State remediation standard regulations may apply.
- Use as fill may be restricted or may require approval by state.
- See [NEWMOA Soil Reuse web page](#) for state-specific information.

# Other Contaminants to Be Aware of



- PCBs (regulated under TSCA and corresponding state regs).
- Asbestos (may be regulated under NESHAPs and/or state regs).
- Emerging contaminants (e.g., PFAS, etc.).

# Examples/Case Studies



- 1) Soil contaminated with lead from a non-listed source at a concentration of 6.5 mg/l by TCLP.
- 2) Soil from the site of a dry cleaner that operated from 1957 to 1973 contaminated with PCE.
- 3) Groundwater from a monitoring well contaminated with virgin MEK from a 2005 tank spill.
- 4) Wood-block flooring from a metal fabricating company that did degreasing using chlorinated solvents.
- 5) Contaminated soil, piping, and tree stumps from a gasoline UST cleanup conducted under 40 CFR 280.



# More Examples



- 6) Tank bottoms from a gasoline UST last used in 1969.
- 7) Spent GAC from a GW pump-and-treat system used to clean up spilled virgin 1,1,1-TCA that is sent back to the GAC manufacturer to be “regenerated.”
- 8) Wastewater in an abandoned WWTU that contains hex chrome at 700 mg/l and is sent off-site for treatment.
- 9) MGP soils contaminated with various PAHs and benzene at 5.0 mg/l by TCLP (benzene TC limit is 0.5 mg/l).
- 10) Used PPE contaminated with listed waste.

# Waste Characterization Should Be an Integral Part of Site-Wide Project Management

- It's tempting to focus on cleanup and worry about characterization later.
- Allows Law of Unintended Consequences to kick in:
  - Enforcement actions/penalties.
  - Unexpected need for approvals/permits.
  - Unnecessary delays and cost overruns.
- Opportunities to minimize disposal cost can be missed:
  - Timing of "Contained-in" determinations.
  - Contaminated soil management and staging.
  - In-situ vs. ex-situ treatment.
- Consider including a RCRA expert in the project design.
  - In-house.
  - Contracted out.



# Future NEWMOA Training on Remediation Waste Management



- Original in-person training provided earlier this year in CT, MA, NH.
  - Available on [NEWMOA website](#).
- This is webinar #1 of 4 to provide more detailed training.
- Remaining webinars will address:
  - “Area of Contamination” and “Contained-In” policies (11/13/2019).
  - Waste piles (TBD).
  - Waste treatment and Land Disposal Restrictions (TBD).
- Other ideas? Let us know!

# Questions?



Ross Bunnell, Senior Sanitary Engineer  
DEEP Waste Engineering & Enforcement Division  
79 Elm Street  
Hartford, CT 06106-5127

Phone: (860) 424-3274

Email: [ross.bunnell@ct.gov](mailto:ross.bunnell@ct.gov)