

# Characterization of Remediation Waste



Overview of Key Concepts

DEEP Remediation Roundtable

October 17, 2017

# Characterization of Remediation Waste: Applicable Laws & Regulations

- Hazardous Waste Regulations.
- Solid Waste/Special Waste Regulations & Statutes.
- Also relevant: Remediation Standard Regulations.
  - Requirements for the Use of Polluted Soil and Reuse of Treated Soil.
  - RCSA Section 22a-133k-2(h).
  - "Polluted soil" = "soil affected by a release of a substance at a concentration above the analytical detection limit for such substance."
  - Specifies how soil excavated from and/or treated at a release area during remediation must be managed.



# Important Waste Characterization Concepts

- Point of Generation.
- Listed vs. Characteristic waste.
- “Contained-in” Policy for Contaminated Environmental Media.
- “Area of Contamination” Policy.
- Requirements for treatment.
- Land Disposal Restrictions (“LDRs”).



# 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 it is removed from the ground (e.g., dug up or pumped out), it is “generated” and becomes a waste – and potentially a hazardous waste.
- This 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.

# Listed vs. Characteristic Waste:

## Characteristic Waste

- Characteristic Hazardous Waste - waste that is hazardous by virtue of a characteristic that it exhibits:
  - Ignitability (D001): liquids with a flash point  $< 140$ , ignitable solids, ignitable compressed gases, DOT oxidizers.
  - Corrosivity (D002):  $\text{pH} \leq 2.0$  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 constituents.
  - Contaminated environmental media containing these wastes is only hazardous if it exhibits a characteristic (after the point of generation).



# Listed vs. Characteristic Waste:

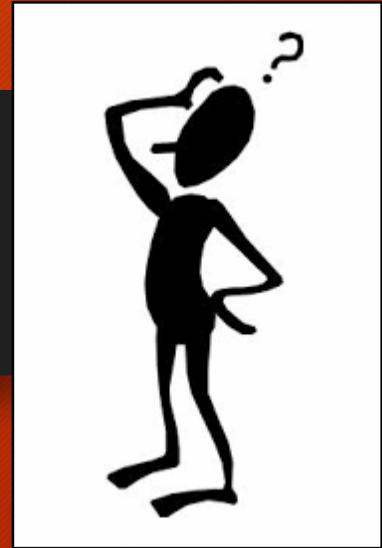
## Listed Waste



- Listed Hazardous Waste - waste that meets a certain definition or "listing." The most common listings include:
  - Listed Spent Solvents (F001 - F005).
  - Metal Finishing Wastes (F006 - F019).
  - Spill & Container Residues of Commercial Chemical Products ("U" and "P" Codes).
    - Must be unused.
    - Must be the commercially pure grade of the chemical, or a product which contains the chemical as the "sole active ingredient."
- "Contained-in" Principle:
  - Contaminated environmental media that contains listed HW is itself a listed hazardous waste (after the point of generation).

# Listed vs. Characteristic Waste:

## Listed Waste (Cont.)



- 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.
- "Documentation" = manifest data, DEEP inspection reports, company & town records, former employees, etc.

# “Contained-in” Policy for Contaminated Environmental Media



- EPA policy allows states to establish health-based criteria by which contaminated environmental media may be considered to no longer contain listed hazardous waste.
- CT DEEP has established such criteria.
- Timing of “contained-in” determination is important:
  - If performed before “generation” → was never a hazardous waste.
  - If performed after “generation” → was a hazardous waste up until the determination was completed.
  - Important for applicability of LDRs (more on this later).
- Caution: Other states may require approval of a “contained-in” determination prior to disposal in their state.

# “Area of Contamination” Policy

- Interpretation created by EPA and supported by CT DEEP.
- AOC = a single, contiguous area of continuous contamination.
- Policy allows certain activities to occur within the AOC without triggering “generation” and the associated RCRA treatment and LDR requirements:
  - Consolidation of waste within the AOC.
  - In-situ treatment within the AOC.
- Does not cover:
  - Movement of waste outside the AOC.
  - Movement of waste between AOCs.
  - Ex-Situ treatment.



# Requirements for Treatment of Contaminated Environmental Media



- General rule: treatment of hazardous waste requires a RCRA permit.
- Some notable exceptions:
  - Treatment of waste that has been “contained-out” (no longer HW).
  - Treatment in accordance with the AOC Policy (not generated yet).
  - Treatment by generators in RCRA tanks, containers, or containment buildings.
  - Treatment in RCRA-exempt wastewater treatment units.
  - Treatment in authorized CAMUs or TUs.
- Treatment of non-hazardous media would require a permit under CGS §22a-454 if conducted by a third-party entity engaged in the business of such treatment.
  - Example: mobile soil treatment company.
- Air or Water permits may also be required in some cases.

# Land Disposal Restrictions ("LDRs") [40 CFR 268]



- Ensure the safe disposal of hazardous wastes and residuals from the treatment of hazardous waste.
- Apply ("attach") at the point of generation, and continue to apply even after a waste is treated and rendered non-hazardous.
- Hazardous waste may not be placed on the land (on or off-site) unless and until it meets applicable LDR standards.
- LDR standards are based on hazardous waste code(s), and can be based on a concentration or a specified treatment technology.
- Contained-in Policy:
  - If waste is "generated" before it is "contained out" → LDRs apply.
  - If waste is "generated" after it is "contained out" → LDRs do not apply.

# Alternative LDR Treatment Standards For Certain Types of Hazardous Waste



- Contaminated Soil [40 CFR 268.49]:
  - Must achieve 90% reduction in contaminant concentration; and,
  - Cannot exceed 10 x Universal Treatment Standard.
- Hazardous Debris [40 CFR 268.45]:
  - “Debris” is > 60 mm (~ 2 ½ in.) in size and either a manufactured object, plant or animal matter, or natural geologic material.
    - Crushed drums, building materials, piping, etc.
  - Can be treated by any of several allowed technologies. Examples:
    - High-temperature metals recovery.
    - Microencapsulation.
    - Macroencapsulation.

# Solid Waste/Special Waste



- RCSA §22a-133k-2(h) - the Commissioner may authorize polluted soil that is not hazardous waste to be disposed of as special wastes as defined in RCSA §22a-209-1.
- A special waste may only be disposed of at a solid waste facility that is specifically authorized to accept that type of special waste.
  - Special Waste Plan (e.g. Manchester Landfill).
  - Special Waste Disposal Authorization.

# Clean Fill



- Exempt from solid waste regulations. [RCSA §22a-209-3]
  - “Clean fill” means (1) natural soil (2) rock, brick, ceramics, concrete, and asphalt paving fragments which are virtually inert and pose neither a pollution threat to ground or surface waters nor a fire hazard and (3) polluted soil as defined in subdivision (45) of subsection (a) of section 22a-133k-1 of the Regulations of Connecticut State Agencies which soil has been treated to reduce the concentration of pollutants to levels which do not exceed the applicable pollutant mobility criteria and direct exposure criteria established in sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies and which soil is reused in accordance with R.C.S.A. subdivision (3) of subsection (h) of section 22a-133k-2 of such regulations.
- Regulations under way to better define “clean fill,” etc.

# Solid/Waste Special Waste (Cont.)

- Alternatives to management of non-hazardous contaminated media as special waste at a solid waste facility:
  - Soil/sediment: management at a soil treatment facility permitted under CGS §22a-454.
  - Groundwater: management at a waste management facility permitted under CGS Section 22a-454.
  - Groundwater: management under a DEEP Wastewater Discharge permit (e.g. individual permit, MISC General Permit or the General Permit for Diversion of Remediation Groundwater).



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

- Tempting to focus on cleanup and worry about characterization later.
- Allows Law of Unintended Consequences to kick in.
- Opportunities to minimize disposal cost can be missed.
  - Timing of “Contained-in” determinations.
  - Contaminated soil management and staging.
  - In-situ treatment vs. ex-situ.
- Can result in a need for unexpected approvals/permits, causing delays and cost overruns.



# Questions?



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

Phone: (860) 424-2374

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