

Requirements for Remediation Waste

NEWMOA Waste Site Cleanup Group
Remedy Selection: Planning for Success & Lessons
Learned

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FIRESIDE INN AND SUITES

25 AIRPORT ROAD

LEBANON, NH



Characterization of Remediation Waste: Applicable Laws & Regulations

- ▶ Hazardous Waste Regulations
 - ▶ State and Federal (RCRA).
 - ▶ Vary from state to state.
- ▶ Solid Waste Regulations
 - ▶ Vary from state to state.
 - ▶ In NH, soil that is taken off-site can be a solid waste and need to be disposed of in a landfill.



Characterization of Remediation Waste: Applicable Laws & Regulations

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- ▶ Remediation Standard Regulations.
 - ▶ Most of the NEWMOA States have them.
 - ▶ 3 NEWMOA States license environmental professionals - (CT, MA, NJ).



Important Waste Characterization Concepts

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- ▶ Hazardous Waste Determination.
- ▶ Listed vs. Characteristic Waste.
- ▶ Point of Generation.
- ▶ Requirements for Treatment.
- ▶ Land Disposal Restrictions (LDRs).



EPA Policies

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- ▶ “Contained-in” Policy for Contaminated Environmental Media.
- ▶ “Area of Contamination” Policy.



HW Determination

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- ▶ Performing a “Hazardous Waste Determination” is the generator’s sole responsibility.
 - ▶ Not the responsibility of the transporter, disposal facility, consultants, Regulatory Agency, etc.
- ▶ “Co-generators” are jointly and severally liable for compliance.
 - ▶ Property owner and facility operator.
 - ▶ Remediation contractor(s).



When the HW Rules Apply

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- ▶ Compliance is required beginning at the point and time of generation.
- ▶ Not when test results come back.



HW Determination Procedure

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1. Is it a solid waste?
2. Is it exempt from the HW rules?
3. Is it a characteristic waste?
4. Is it a listed waste or contaminated environmental media or debris?
5. Is it a hazardous waste mixture?



Listed vs. Characteristic Waste: Characteristic Waste (I,C,R,T)

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- ▶ Characteristic Hazardous Waste – waste that exhibits the characteristic of:
 - ▶ Ignitability (D001) - liquids with a flash point < 140°F, ignitable solids, ignitable compressed gases, DOT oxidizers.
 - ▶ Corrosivity (D002) - pH \leq 2.0 or \geq 12.5, solid (NH).
 - ▶ Reactivity (D003) - react with water, explosives, some cyanide and sulfide bearing wastes.
 - ▶ Toxicity (D004 – D043) - exceed TCLP threshold for one or more constituents.



Environmental Media

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- ▶ Contaminated environmental media containing characteristic wastes is only hazardous if it exhibits a HW characteristic (at the point of generation).
- ▶ NOTE: “ Env. Media” = soil, groundwater, surface water and sediment.



Listed vs. Characteristic Waste: Listed Waste (P,U,F,K)

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- ▶ Listed Hazardous Waste – waste that meets a certain definition or “listing.” The most common listings include:
 - ▶ Commercial Chemical Products (P- and U-listed).
 - ▶ Unused & pure grade or “sole active ingredient.”
 - ▶ Listed Spent Solvents (F001 – F005).
 - ▶ Metal Finishing Wastes (F006 – F019).
 - ▶ Specific Industrial Process Wastes (K062).
 - ▶ State-specific listed wastes in some NEWMOA states (see state HW Regs).



Spills and Releases

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- ▶ A release of a listed or characteristic hazardous waste may generate an environmental media or debris that contains the hazardous waste.
- ▶ For characteristic waste, it may no longer exhibit the characteristic when remediation is complete.
- ▶ Listed hazardous waste will remain listed unless delisted or contained-out.



EPA Contained-In Policy

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- ▶ Contaminated environmental media and debris that contains listed HW is regulated as a listed hazardous waste (at the point of generation).
- ▶ Can vary from state to state.



Source of Contamination

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- ▶ 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.



Date of Contamination

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- ▶ What if you don't know when the contamination happened?
 - ▶ If, after good faith efforts to determine the date of contamination, you are unable to do so because documentation is unavailable or inconclusive, it is NOT necessary to assume that it was regulated at the time of disposal or that LDRs apply.



What is Documentation?

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- ▶ “Documentation” = manifest data, inspection reports, company & town records, former employees, Sanborn Maps (1860's to 1990's), etc.



Relevant Reading Material

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- ▶ Management of Remediation Waste under RCRA
10/14/1998 – Doc# EPA530-F-98-026
- ▶ <https://www.epa.gov/sites/production/files/2013-10/documents/remediawaste-rpt.pdf>

Reflect

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- ▶ Any questions up to this point?



Point of Generation



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- ▶ 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.

Point of Generation

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- ▶ This does not apply to environmental media that was contaminated with hazardous waste after the effective date of RCRA.
- ▶ Point of generation → must begin complying with HW requirements.



Effective Date of RCRA

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- ▶ “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.
- ▶ NH: RSA 147-A:4 requires a RCRA permit for operating a hazardous waste facility or disposing of HW on or after 7/1/1980.



“Contained-in” Policy for Listed HW in Contaminated Environmental Media

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- ▶ EPA policy allows states to establish health-based criteria by which contaminated environmental media may be considered to no longer contain listed hazardous waste.
- ▶ All of the NEWMOA states have established such criteria.
- ▶ NH refers to the state equivalent process as a “Contained-out Determination” that usually requires disposal in a SW landfill.



Contained-Out Timing

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- ▶ Timing of “contained-out” determination is important for pre-RCRA HW disposal:
 - ▶ If performed before “generation” → was never a hazardous waste.
 - ▶ If performed after “generation” → is a regulated hazardous waste up until the contained-out determination is completed.
 - ▶ Important for applicability of LDRs (more on this later).
- ▶ Caution: Some states and disposal facilities may require formal approval of a “contained-out” determination prior to disposal in their state.



“Area of Contamination” Policy

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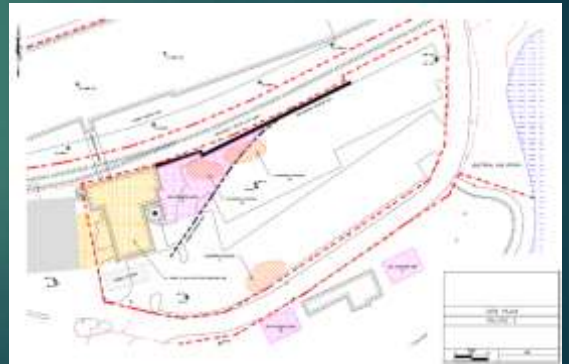
- ▶ EPA policy supported by most NEWMOA States (check w/ your state).
- ▶ AOC = a single, contiguous area of continuous contamination.
- ▶ Policy allows certain activities to occur within the AOC without triggering “generation” and the associated RCRA treatment and LDR requirements:
 - ▶ Consolidation of waste within the AOC.
 - ▶ In-situ treatment within the AOC.



AOC Policy Does Not Cover

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- ▶ Movement of waste outside the AOC.
- ▶ Movement of waste between AOCs.
- ▶ Ex-Situ treatment.
- ▶ Active management.



Requirements for Treatment of Contaminated Environmental Media

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- ▶ General rule: treatment of hazardous waste requires a RCRA permit.
- ▶ Notable exceptions may include:
 - ▶ Treatment of waste that has been “contained-out” (no longer HW).
 - ▶ In-situ treatment in accordance with the AOC Policy.
 - ▶ Generator treatment in tanks, containers or containment buildings.
 - ▶ Treatment in RCRA-exempt wastewater treatment units.
 - ▶ Treatment in authorized CAMUs or Temporary Units.
 - ▶ Check with your state for specifics!!!!



Requirements for Treatment of Contaminated Environmental Media

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- ▶ Treatment of non-hazardous media may still require a state permit.
 - ▶ Example: mobile soil treatment company.
- ▶ Air or Water permits may also be required in some cases.
 - ▶ Examples: Soil venting, groundwater pump and treat systems.



Land Disposal Restrictions (LDR) 40 CFR 268

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- ▶ Purpose: to ensure the safe disposal of hazardous wastes and residuals from the treatment of hazardous waste.
- ▶ Apply (i.e., attach) at the point of generation, and continue to apply even after a waste is treated and rendered non-hazardous.



LDRs Continued

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- ▶ Hazardous waste may not be placed on the land (on or off-site) until it meets applicable LDR standards.
- ▶ LDR standards are based on hazardous waste codes, and require treatment to a specific concentration value or use of a specified treatment technology.



LDR Treatment Standard 40 CFR 268.40

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TREATMENT STANDARDS FOR HAZARDOUS WASTES—Continued
[Note: NA means not applicable]

Waste code	Waste description and treatment/Regulatory subcategory ¹	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS ² number	Concentration ³ in mg/L; or Technology Code ⁴	Concentration ² in mg/kg unless noted as "mg/L TCLP"; or Technology Code ⁴
D018 ⁹	Wastes that are TC for Benzene based on the TCLP in SW846 Method 1311.	Benzene	71-43-2	0.14 and meet § 268.48 standards ⁵	10 and meet § 268.48 standards ⁶

⁹ These wastes, when rendered nonhazardous and then subsequently injected in a Class SDWA well, are not subject to treatment standards. (See § 148.1(d)).

LDR Universal Treatment Standards (UTS) - 40 CFR 268.48

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- ▶ Special requirements for Characteristic HW.
- ▶ Decharacterize.
- ▶ Must treat for Underlying Hazardous Constituents (UHCs) that exceed UTS.
 - ▶ That are reasonably expected to be present in the waste.

Alternative LDR Treatment Standards For Soil - 40 CFR 268.49

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- ▶ Check with your state regarding applicability.
- ▶ Contaminated Soil:
 - ▶ Must achieve 90% reduction in contaminant concentration;
 - ▶ Capped by 10 x Universal Treatment Standard (UTS),
 - ▶ Whichever is greater (must be < characteristic).



Alternative LDR Soil Standard – Listed HW - 40 CFR 268.49

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If LDRs	And if LDRs	And if	Then you
Applied to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	Must comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	The soil is determined to contain the listed waste when the soil is first generated.	Must comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Apply to the listed waste now.	The soil is determined not to contain the listed waste when the soil is first generated.	Needn't comply with LDRs.
Didn't apply to the listed waste when it contaminated the soil*.	Don't apply to the listed waste now.	Needn't comply with LDRs.

* For dates of LDR applicability, see 40 CFR Part 268 Appendix VII. To determine the date any given listed hazardous waste contaminated any given volume of soil, use the last date any given listed hazardous waste was placed into any given land disposal unit or, in the case of an accidental spill, the date of the spill.

Contained-Out with LDR

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- ▶ If waste is “generated” after it is “contained out” → LDRs do not apply.
- ▶ If waste is “generated” before it is “contained out” → LDRs apply.
 - ▶ However, even if LDRs apply, contaminated environmental media and debris are able to be contained-out.

Knowledge Check

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- ▶ What is contaminated environmental media?
 - ▶ Soil, groundwater, surface water and sediment.

- ▶ What is debris?
 - ▶ Haven't discussed that yet.

Alternative LDR Treatment Standards For Hazardous Debris - 40 CFR 268.45

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- ▶ "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: Extraction (high-temperature metals recovery), Destruction (thermal oxidation), and Immobilization (microencapsulation).

Reflect

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- ▶ Any questions up to this point?



LDR: Summary of Requirements Doc# EPA530-R-01-007

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- ▶ <https://www.epa.gov/sites/production/files/documents/lidisressumm-rpt.pdf>
- ▶ Figure 3-1 Underlying Hazardous Waste Constituents (Pg. 27)
- ▶ Figure 4-1 Alternative Debris Treatment Standards (Pg. 40)
- ▶ Figure 4-2 Alternative Soil Treatment Standards (Pg. 55)

Figure 3-1. Underlying Hazardous Constituents

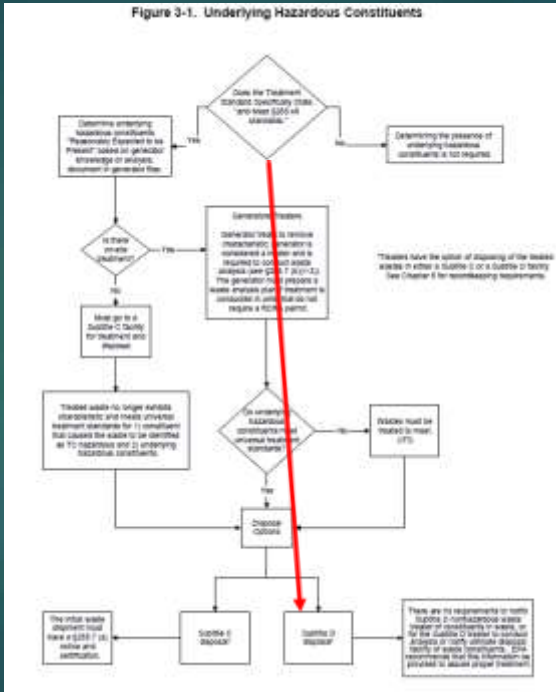
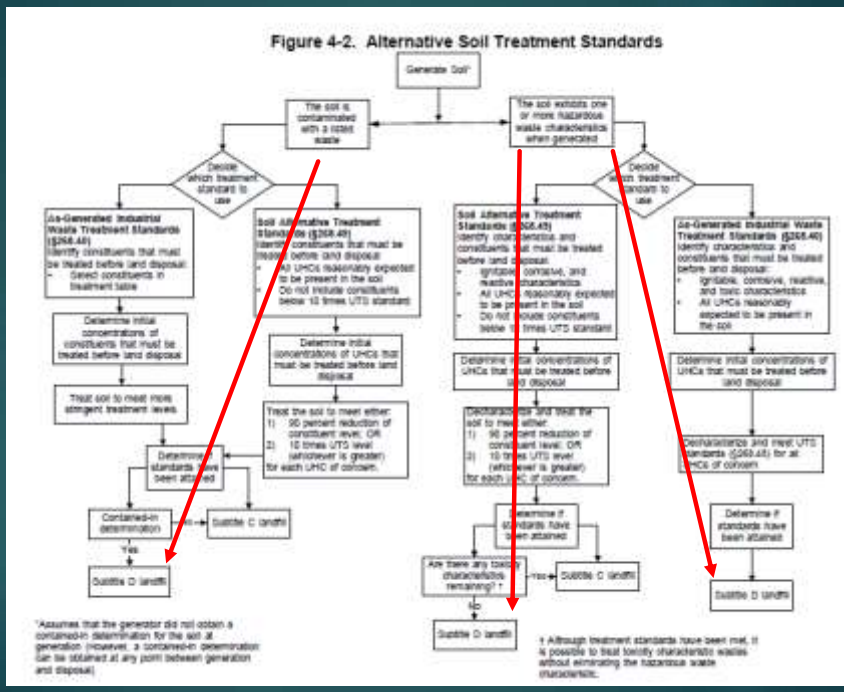
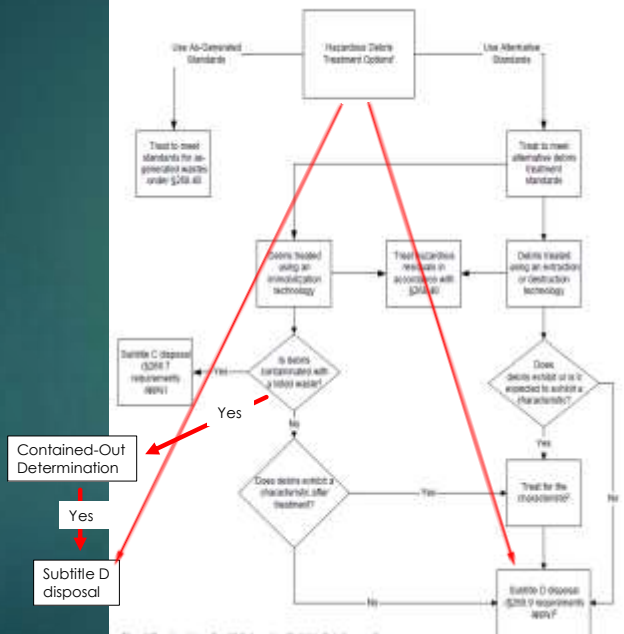


Figure 4-2. Alternative Soil Treatment Standards



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Figure 4-1. Alternative Debris Treatment Standards



Solid Waste/Special Waste/Use as Fill 42

- ▶ 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.
 - ▶ Landfill or soil roaster.
- ▶ Use as fill may be restricted or may require approval by state.
- ▶ See [NEWMOA Soil Reuse web page](#) for state-specific information.



NEMR of Madbury, NH

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- ▶ ASR Disposal
- ▶ Operated 1974-present, inactive
- ▶ Remediated in 2006 under RAP
- ▶ TCLP Pb >5 PPM Toxicity Characteristic
- ▶ LDR as generated waste
- ▶ Contaminated soil
- ▶ Contaminated debris



Examples/Case Studies

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1. Soil excavated, placed in a pile outside the AOC, and not discovered to be hazardous until sample results came back.
2. Soil w/ listed solvents excavated and placed in roll-offs, "contained-out," and sent to a SW LF, but did not meet LDRs.
3. Wood-block flooring not discovered to be contaminated with a listed solvent until removed and staged in outdoor piles.

Remediation Waste: Takeaways ☺

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- ▶ 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:
 - ▶ Enforcement actions/penalties.
 - ▶ Unexpected need for approvals/permits.
 - ▶ Unnecessary delays and cost overruns.



Remediation Waste: Takeaways ☺

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- ▶ Opportunities to minimize disposal cost can be missed:
 - ▶ Timing of “Contained-out” 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

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- ▶ Future NEWMOA training being planned on remediation waste management. Possibly:
 - ▶ Focused presentation on waste characterization and listed HW.
 - ▶ Focused presentation on AOC and “Contained-Out” policies.
 - ▶ Focused presentation on waste piles.
 - ▶ Focused presentation on LDRs and waste treatment.
 - ▶ Other ideas? Let us know!



Questions?

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