

<u>SUBJECT</u>		<u>DATE</u>
1448.	Definitions of Inactive Portion, Active Portion and Closed Portion of a RCRA TSDF	AUG 12, 2021
1449.	Dangerous Waste Designations and Dangerous Waste Code Determinations	AUG 19, 2021
1450.	Method Detection Limits and Hazardous Waste Determinations	ENCORE AUG 26, 2021
1451.	Method Detection Limits and Hazardous Waste Determinations II	ENCORE SEP 2, 2021
1452.	Totals Analysis vs. TCLP and Dividing by 20	ENCORE SEP 9, 2021
1453.	Decharacterized RCRA Waste - Manifesting and LDR Reporting	ENCORE SEP 16, 2021
1454.	Decharacterized Hazardous Waste Listed Solely for Non-Toxic Characteristics	ENCORE SEP 23, 2021
1455.	Decharacterized Wastes and the LDR Dilution Prohibition	ENCORE SEP 30, 2021
1456.	The "Derived from Rule", the "Mixtures Rule", and the "Contained-In Policy"	ENCORE OCT 7, 2021
1457.	Hazardous Debris and Options to Exclude as a Dangerous Waste	OCT 14, 2021
1458.	Regulatory Status of Characteristic Baghouse Dust Destined for Reclamation	OCT 21, 2021
1459.	RCRA Point of Generation and Baghouse Dust Collection Systems	OCT 28, 2021
1460.	Pumps Containing Liquid Hazardous Wastes and Liquids in Landfill Prohibition	ENCORE NOV 4, 2021
1461.	Pumps Containing Liquid Hazardous Waste and Land Disposal Restrictions	ENCORE NOV 11, 2021
1462.	Pumps Containing Liquid Hazardous Wastes and RCRA Empty Containers	NOV 18, 2021
1463.	Multiple Characteristic Hazardous Waste Codes and Underlying Hazardous Constituents	ENCORE NOV 23, 2021
1464.	LDR Notifications/Certifications and Generator Permitted Treatment, Storage, or Disposal Facility	ENCORE DEC 2, 2021
1465.	Multiple Characteristic and Listed Hazardous Waste Codes and the "in lieu of" LDR Principle	ENCORE DEC 9, 2021
1466.	Universal Wastes - Recycling versus Disposal	ENCORE DEC 16, 2021
1467.	'Twas the Night Before Christmas – The Twenty-Eighth Edition	DEC 24, 2021
1468.	Spent Lead Acid Batteries vs., Universal Wastes	ENCORE DEC 30, 2021
1469.	Hazardous Debris and Radioactively Contaminated Cadmium Batteries	ENCORE JAN 6, 2022

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TWO MINUTE TRAINING

TO: CENTRAL PLATEAU CLEANUP COMPANY

FROM: PAUL W. MARTIN, RCRA Subject Matter Expert
CPCCo Environmental Protection, Hanford, WA

SUBJECT: HAZARDOUS DEBRIS AND RADIOACTIVELY CONTAMINATED CADMIUM BATTERIES

DATE: JANUARY 6, 2022

<u>CPCCo Projects</u>	<u>CPCCo Functionals</u>	<u>HMIS</u>	<u>Hanford Laboratories</u>	<u>Other Hanford Contractors</u>	<u>Other Hanford Contractors</u>
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TWO MINUTE TRAINING

SUBJECT: Hazardous Debris and Radioactively Contaminated Cadmium Batteries

Q: A customer has a debris mixture consisting of primarily debris material (>50%) and a lesser portion of radioactively contaminated cadmium batteries (RCBs). The customer would like to manage the mixture per the alternative treatment standards for debris found at [40 CFR 268.45](#). Can a mixture of debris and RCBs be managed under the alternative treatment standards of debris?

A: Yes - but with some provisions.

If the waste mixture is primarily debris with some RCBs, the waste mixture could be managed under 40 CFR 268.45, "Treatment standards for hazardous debris" and use any appropriate destruction, extraction, or immobilization technology listed in Table 1 of 40 CFR 268.45. A limiting factor would be the radioactive contamination which could render most, if not all, of the available destruction or extraction technologies as technically inappropriate. As an example, a treater would not want to use physical, chemical or thermal extraction or thermal destruction technologies on RCBs due to the likely spread of radioactive contamination to workers and the environment. However, if the treater could address the radioactive issues and meet any contaminant restrictions noted in Table 1 of 40 CFR 268.45, any technically appropriate debris treatment method could be used for this mixture of primarily debris with some RCBs. The most practical treatment option would be an immobilization technology such as macroencapsulation, microencapsulation, or sealing.

On the other hand, if the waste mixture is primarily RCBs and some debris, the waste would require management under [40 CFR 268.40](#), Table "Treatment Standards for Hazardous Waste" and the waste-specific treatment standards for D006 RCBs which is "Macroencapsulation in accordance with 40 CFR 268.45". The limiting factor in this scenario is that the mixture of primarily RCBs and some debris must be treated specifically via macroencapsulation at 40 CFR 268.45. Other alternative immobilization treatment standards of debris such as microencapsulation or sealing, or destruction or extraction technologies, would not be available.

Therefore, if the mixture is primarily debris and some RCBs, any appropriate alternative treatment standard of debris could be used. Most likely that would be an immobilization technology of macroencapsulation, microencapsulation or sealing. However, if the mixture is primarily RCBs and some debris, only the alternative treatment standard of debris for macroencapsulation could be used.

Note that the above concepts would also apply to radioactively contaminated mercury and silver batteries.

SUMMARY:

- Radioactive cadmium batteries can be managed under the alternative treatment standards for debris with provisions.
- If the waste mixture is primarily debris and some radioactively contaminated cadmium batteries, any technically appropriate alternative treatment standard of debris under 40 CFR 268.45 can be used.
- If the waste mixture is primarily radioactively contaminated cadmium batteries and some debris, the treatment standard under 40 CFR 268.40 which references the 40 CFR 268.45 alternative treatment standard of debris for macroencapsulation, must be used.

Excerpts from 40 CFR 268.40 and 40 CFR 268.45 are attached to the e-mail. If you have any questions, please contact me at [Paul W Martin@rl.gov](mailto:Paul_W_Martin@rl.gov) or at (509) 376-6620.

FROM: Paul W. Martin

DATE: 1/6/2022

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TWO MINUTE TRAINING

SUBJECT: Hazardous Debris and Radioactively Contaminated Cadmium Batteries

40 CFR 268.40 Applicability of treatment standards / Treatment Standards for Hazardous Wastes

Regulated hazardous constituent				Wastewaters	Nonwastewaters
Waste Code	Waste Description and treatment/Regulatory Subcategory	Common Name	CAS#	Concentration in mg/L; or Technology Code	Concentration in mg/kg unless noted as "mg/L TCLP" or Technology Code
D006	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for cadmium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Cadmium	7440-43-9	0.69 and meet §268.48 standards	0.11 mg/L TCLP and meet §268.48 standards
	Cadmium Containing Batteries Subcategory. (Note: This subcategory consists of nonwastewaters only).			NA	RTHRM <i>[Thermal recovery of metals or inorganics from nonwastewaters in industrial furnaces.]</i>
	Radioactively contaminated cadmium containing batteries. (Note: This subcategory consists of nonwastewaters only).			NA	Macroencapsulation in accordance with 40 CFR 268.45.

40 CFR 268.45 Treatment standards for hazardous debris / Table 1.--Alternative Treatment Standards for Hazardous Debris

Technology description	Performance and/or design and operating standard	Contaminant restrictions
C. Immobilization		
1. Macroencapsulation: Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.	Encapsulating materialist completely encapsulate debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).	None.
2. Microencapsulation: Stabilization of the debris with the following reagents (or waste reagents) such that the leachability of the hazardous contaminants is reduced: (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust). Reagents (e.g., iron salts, silicates, and clays) may be added to enhance the set/cure time and/or compressive strength, or to reduce the leachability of the hazardous constituents.	Leachability of the hazardous contaminants must be reduced.	None.
3. Sealing: Application of an appropriate material which adheres tightly to the debris surface to avoid exposure of the surface to potential leaching media. When necessary to effectively seal the surface, sealing entails pretreatment of the debris surface to remove foreign matter and to clean and roughen the surface. Sealing materials include epoxy, silicone, and urethane compounds, but paint may not be used as a sealant.	Sealing must avoid exposure of the debris surface to potential leaching media and sealant must be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).	None.

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