

<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
1470. Hazardous Debris and Radioactively Contaminated Lead-Acid Batteries	ENCORE	JAN 13, 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 LEAD-ACID BATTERIES

**DATE:** JANUARY 13, 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>
Tania Bates Theresa Boles Justin Bolles Rene Catlow Peter Ceton Richard Clinton Patty Drago Paul Fernandez Ryan Fisher Randal Fox Cory Grabeel Lawanda Grow Char Hall Stuart Hildreth Sarah Horn Aprill Jivelekas Sasa Kosjerina William Krueger Richard Lipinski Stuart Mortensen Edward Myers Trey Reppe Dave Richards Sean Sexton Dave Shea Seth Slater Phil Sheely Jeff Westcott Richard Willson Nick Wood Jon Wright	Jeff Bramson Bob Bullock Frank Carleo Bob Cathel Danielle Collins Stacy Cutter Jeanne Elkins Jonathan Fullmer Bailey Hardy Steve Heninger John Hultman Julie Johanson Mitch Marrott Stewart McMahand Carlie Michaelis Brian Mitcheltree Anthony Nagel Chris Plager Linda Petersen Brent Porter Deborah Singleton Dale Snyder Dave St. John Kat Thompson Daniel Turlington Britt Wilkins Jennifer Williams	Brett Barnes Mike Demiter Kip George Jerry Cammann Garin Erickson Dashia Huff Mark Kamberg Jon McKibben Saul Martinez Matt Mills John Hultman Carly Nelson Eric Pennala Jon Perry Christina Robison Christian Seavoy David Shaw John Skoglie Greg Sullivan	(TBD)  <u>DOE RL, ORP, WIPP</u>  Duane Carter Tony McKarns	Bill Bachmann Dean Baker Scott Baker Michael Carlson Paul Crane Tina Crane Ron Del Mar John Dorian Mark Ellefson Darrin Faulk Rob Gregory James Hamilton Leah Hare Andy Hobbs Stephanie Johansen Ryan Johnson Megan Lerchen Mike Lowery Michael Madison Terri Mars Cary Martin Steve Metzger Tony Miskho Tom Moon Chuck Mulkey Michelle Oates Kirk Peterson	Dan Saueressig Lana Strickling Joelle Moss Glen Triner Greg Varljen Robin Varljen Julie Waddoups Jay Warwick Ted Wooley

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## TWO MINUTE TRAINING

**SUBJECT:** Hazardous Debris and Radioactively Contaminated Lead-acid Batteries

**Q:** Last week we learned that radioactive cadmium or mercury batteries could be macroencapsulated as debris per the waste specific treatment standards at [40 CFR 268.40](#). But what if the radioactive batteries were lead-acid? Can mixtures of debris and drained radioactive lead-acid batteries be managed as debris under [40 CFR 268.45](#)?

**A:** Lead-acid batteries have two strikes against them in terms of the alternative standards of debris at 40 CFR 268.45. First, the drained lead-acid batteries are still considered RCRA containers and if the batteries are intact and mixed with debris, the intact lead-acid batteries would have to be removed from the debris, if the generator wanted to manage the remaining debris per the 268.45 standards. Secondly, at 40 CFR 268.40 the lead-acid batteries have a specified technology treatment standard of thermal recovery of lead in secondary smelters (RLEAD); or if radioactively contaminated, a specified technology treatment standard for radioactive lead solids of macroencapsulation (MACRO). Per an EPA memo dated August 9, 2001, ([RO 14554](#)), the Department of Energy (DOE) asked EPA which Land Disposal Restriction (LDR) treatment standard applies to radioactive lead-acid batteries: the LDR treatment standard that requires lead recovery (RLEAD) which is not appropriate for radioactively contaminated batteries; or the LDR treatment standard for radioactive lead solids, shielding and other forms of elemental lead that requires macroencapsulation (MACRO) per [40 CFR 268.42](#). In the memo EPA stated:

*"We agree with you that the appropriate treatment standard is macroencapsulation. This treatment standard applies not only to lead shielding, but to other elemental forms of lead. Thus, there is latitude in the treatment standard to permit its application to radioactive lead-acid batteries. We also believe that macroencapsulation is appropriate because it would require less worker handling than lead recovery, and we want to minimize worker exposure to radioactivity. Furthermore, lead recovery of these batteries would radioactively contaminate the entire mass of lead that was recovered, making it unusable."*

Also note that MACROencapsulation for radioactive lead solids as defined at 40 CFR 268.42 is slightly different from macroencapsulation for hazardous debris as defined at 40 CFR 268.45. The major difference between the two definitions is that MACROencapsulation under 268.42 specifically does not allow macroencapsulation via the use of tanks or containers as defined at [40 CFR 260.10](#), whereas macroencapsulation under 268.45 does allow macroencapsulation via tanks or containers, e.g., debris can be disposed in stainless steel drums.

Therefore, a mixture of debris and drained radioactively contaminated lead-acid batteries could be MACROencapsulated as defined at 268.42 to meet the LDR treatment standards for radioactive lead solids and for debris. However, the MACROencapsulation would have to be in the form of surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Tanks or containers could not be used since this is not macroencapsulation as defined at 40 CFR 268.45.

### SUMMARY:

- A mixture of debris and drained radioactive lead-acid batteries could be MACROencapsulated as radioactive lead solids per 40 CFR 268.42 to meet LDR treatment standards for both the batteries and the debris.
- The 268.42 and 268.45 definitions of macroencapsulation are slightly different, and per 40 CFR 268.42 a tank or container cannot be used to macroencapsulate debris such as radioactively contaminated lead-acid batteries.
- If the mixture of debris and batteries is MACROencapsulated via surface coatings or inert jackets, the LDR treatment standards for both radioactive lead solids and debris are met.

Excerpts from 40 CFR 268.40, 268.42, 268.45 and the EPA Memo dated August 9, 2001, 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:** 1/13/2022

**FILE:** 2MT\2022\011322.rtf

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**TWO MINUTE TRAINING - ATTACHMENT**

**SUBJECT:** Hazardous Debris and Radioactively Contaminated Lead-acid 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
D008	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for lead based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Lead	7439-92-1	0.69 and meet §268.48 standards	0.75 mg/L TCLP and meet §268.48 standards
	Lead Acid Batteries Subcategory (Note: This standard only applies to lead acid batteries that are identified as RCRA hazardous wastes and that are not excluded elsewhere from regulation under the land disposal restrictions of 40 CFR 268 or exempted under other EPA regulations (see 40 CFR 266.80). This subcategory consists of nonwastewaters only.)			NA	RLEAD <i>[Thermal recovery of lead in secondary lead smelters.]</i>
	Radioactive Lead Solids Subcategory (Note: These lead solids include, but are not limited to, all forms of lead shielding and other elemental forms of lead. These lead solids do not include treatment residuals such as hydroxide sludges, other wastewater treatment residuals, or incinerator ashes that can undergo conventional pozzolanic stabilization, nor do they include organo-lead materials that can be incinerated and stabilized as ash. This subcategory consists of Nonwastewaters only.)			NA	MACRO

## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT:** Hazardous Debris and Radioactively Contaminated Lead-acid Batteries

### 40 CFR 268.42 Treatment standards expressed as specified technologies

**MACRO:** Macroencapsulation with surface coating materials such as polymeric organics (e.g., resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.

Macroencapsulation specifically does not include any material that would be classified as a tank or container according to 40 CFR 260.10. (Emphasis added)

**RLEAD:** Thermal recovery of lead in secondary lead smelters.

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

Technology description C. Immobilization	Performance and/or design and operating standard	Contaminant restrictions
<b>1. Macroencapsulation:</b> 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 material must 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.

\* Note the lack of prohibitive wording about not using tanks or containers to achieve macroencapsulation. PWMartin comment

## TWO MINUTE TRAINING - ATTACHMENT

**SUBJECT:** Hazardous Debris and Radioactively Contaminated Lead-acid Batteries

August 9, 2001

Andy Lawrence, Director  
Office of Environmental Policy and Guidance  
Department of Energy  
Washington, DC 20585

Dear Mr. Lawrence:

Thank you for your letter dated May 24, 2001 requesting clarification of the Land Disposal Restrictions (LDR) treatment standard for discarded radioactive contaminated lead acid batteries. As you know, the LDR treatment standard must be met before hazardous waste may be land disposed. There are three subcategories under the LDR treatment standard for lead: numerical treatment standards are required for general wastes exhibiting the lead toxicity characteristic (TC); lead recovery (i.e., smelting) is required for lead acid batteries; and macroencapsulation is required for radioactive lead shielding and other elemental forms of lead.

You explained that several Department of Energy facilities manage drained, lead acid batteries which are radioactively contaminated. These batteries display the TC for lead. You asked whether you should apply the LDR treatment standard that requires lead recovery, or the one that requires macroencapsulation of radioactive lead shielding and other forms of elemental lead.

We agree with you that the appropriate treatment standard is macroencapsulation. This treatment standard applies not only to lead shielding, but to other elemental forms of lead. Thus, there is latitude in the treatment standard to permit its application to radioactive lead acid batteries. We also believe that macroencapsulation is appropriate because it would require less worker handling than lead recovery, and we want to minimize worker exposure to radioactivity. Furthermore, lead recovery of these batteries would radioactively contaminate the entire mass of lead that was recovered, making it unusable.

I hope you find this information helpful. Do not hesitate to contact me if you have questions.

Sincerely,

Elizabeth A. Cotsworth, Director  
Office of Solid Waste

RO 14554