	SUBJECT		DATE
1339.	The Hazardous Waste Characteristic of Reactivity (D003)	ENCORE	JUL 11, 2019
1340.	Central Accumulation Areas and Signage Requirements		JUL 18, 2019
1341.	RCRA EPA Identification Numbers – Site Specifics	ENCORE	JUL 25, 2019
1342.	RCRA EPA Identification Numbers – Transporters	ENCORE	AUG 1, 2019
1343.	Paint Wastes and the Applicability of the F001-F005 Listings to Ingredients	ENCORE	AUG 8, 2019
1344.	F Listings and Ingredients in Commercial Chemical Product Formulations	ENCORE	AUG 15, 2019
1345.	PCB Containers and ≥50 ppm	ENCORE	AUG 22, 2019
1346.	CERCLA Hazardous Substances – The Petroleum Exclusion	ENCORE	AUG 29, 2019
1347.	PCB Concentration Assumptions for Use vs. PCB Disposal	ENCORE	SEP 5, 2019
1348.	RCRA LR One-Year Storage Prohibition vs., PCB One-Year Disposal Time Limit		SEP 12, 2019
1349.	Regulatory Status of PCB Remediation Wastes Disposed Prior to April 18, 1978	ENCORE	SEP 19, 2019
1350.	Regulatory Status of PCB Remediation Wastes Disposed Prior to April 18, 1978 – A Follow-Up		SEP 26, 2019
1351.	PCB Waste Regulation and April 18, 1978 vs. July 2, 1979		OCT 3, 2019
1352.	PCB Waste Storage Limitations and the One-Year Extension	ENCORE	OCT 10, 2019
1353.	PCB Waste Storage Limitations and the PCB Radioactive Waste Exemption	ENCORE	OCT 17, 2019
1354.	LDR One-Year Storage Prohibition and Generator Permitted Storage	ENCORE	OCT 24, 2019
1355.	LDR Notification/Certification and Generator Permitted Storage		OCT 31, 2019
1356.	Disposing of PCB Ballasts with PCB Potting Material	ENCORE	NOV 7, 2019
1357.	Fluorescent Light Ballasts and PCB Annual Reporting	ENCORE	NOV 14, 2019
1358.	Multiple Characteristic Hazardous Waste Codes and Underlying Hazardous Constituents	ENCORE	NOV 21, 2019
1359.	Multiple Characteristic and Listed Hazardous Waste Codes and the "in lieu of" LDR Principle	ENCORE	NOV 26, 2019
1360.	Universal Waste Lamps and Prohibition on Crushing	ENCORE	DEC 5, 2019
1361.	Used Oil and Weekly Inspections	ENCORE	DEC 12, 2019
1362.	Used Oil and Keeping Containers Closed – Washington State vs. the Feds	ENCORE	DEC 19, 2019
1363.	'Twas the Night Before Christmas – The Twenty-Sixth Annual Edition		DEC 24, 2019
1364.	Generator Weekly Inspection Log Documentation – Federal vs. WA State	ENCORE	JAN 2, 2020
1365.	PCB Reporting and Recordkeeping Relief	ENCORE	JAN 9, 2020
1366.	Satellite Accumulation and Product Vessel Cleanouts	ENCORE	JAN 16, 2020
1367.	TSDF Requirements When Shipping Dangerous Waste to another TSDF		JAN 23, 2020
1368.	The Hazardous Waste Manifest Instructions – Where did they go?		JAN 30, 2020
1369.	The Mixtures Rule – Washington State vs. The Feds	ENCORE	FEB 6, 2020
1370.	Used Oil and the Rebuttable Presumption		FEB 13, 2020
1371.	Used Oil, Secondary Containment and Response to Spills	ENCORE	FEB 20, 2020
1372.	Used Oil Eligibility for Animal and Vegetable Oils	ENCORE	FEB 27, 2020
1373.	Used Oil Eligibility for Petroleum Oils Mixed with Animal or Vegetable Oils	ENCORE	MAR 5, 2020
1374.	Mercury Wet Cell Batteries - Debris or Not Debris?	ENCORE	MAR 12, 2020
1375.	Hazardous Debris and Non-Radioactive Lead-Acid Batteries	ENCORE	MAR 19, 2020
1376.	Radioactively Contaminated Lead-Acid Batteries and Hazardous Debris	ENCORE	MAR 26, 2020

TWO MINUTE TRAINING

TO: *CH2M HILL PLATEAU REMEDIATION COMPANY*

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

SUBJECT: *RADIOACTIVELY CONTAMINATED LEAD-ACID BATTERIES AND HAZARDOUS DEBRIS*

DATE: *MARCH 26, 2020*

CHPRC Projects	CH PRC - Env. Protection	MSA	Hanford Laboratories	Other Hanford Contractors	Other Hanford Contractors
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		Greg Sullivan		Tom Moon	
				Chuck Mulkey	
				Kirk Peterson	

TWO MINUTE TRAINING

SUBJECT: Radioactively Contaminated Lead-Acid Batteries and Hazardous Debris

Q: Last week's Two Minute Training (2MTs) concerned non-radioactive lead-acid batteries not being eligible for management as hazardous debris since lead-acid batteries have a specific LDR treatment standard at 40 CFR 268.40. But let's cut to the chase and talk about management of spent radioactive lead-acid batteries. How are drained radioactively contaminated lead-acid batteries managed in terms of hazardous waste disposal, i.e., the Land Disposal Restrictions (LDR)?

A: Lead-acid batteries have two inherent strikes against them in terms of disposal as either hazardous debris under 40 CFR 268.45 or as hazardous waste under 40 CFR 268.40. First, the drained lead-acid batteries are still considered nonempty RCRA containers due to the lead plates and if the batteries are intact and mixed with debris, the intact lead-acid batteries would have to be removed from the debris managed under 40 CFR 268.45 standards. Secondly, 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 LDR treatment standard should be applied to radioactively contaminated lead-acid batteries: the LDR treatment standard that requires lead recovery (which is not appropriate for batteries that are radioactively contaminated), 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 MACRO-encapsulation for radioactive lead solids as defined at 40 CFR 268.42 is slightly, but significantly different from macroencapsulation for hazardous debris as defined at 40 CFR 268.45. The major difference between the two definitions is that MACRO-encapsulation under 268.42 specifically does not allow macroencapsulation by using tanks or containers as defined at 40 CFR 260.10, whereas macroencapsulation under 268.45 does allow macroencapsulation by using tanks or containers, e.g., waste can be placed in a suitable container or tank, welded closed and considered macroencapsulated.

Therefore, a mixture of debris and drained radioactively contaminated lead-acid batteries could be MACRO-encapsulated as defined at 268.42 to meet the LDR treatment standards for radioactive lead solids and for debris. However, the MACRO-encapsulation 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 MACRO-encapsulation does not include the option for using containers or tank in the same way that is allowed for macroencapsulation as specified in 268.45.

SUMMARY:

- A mixture of debris and drained radioactively contaminated lead-acid batteries could be MACRO-encapsulated as radioactive lead solids per 40 CFR 268.42 to meet LDR treatment standards for both the radioactive 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 radioactively contaminated lead-acid batteries.
- If the mixture of debris and radioactive batteries is MACRO-encapsulated via surface coatings or inert jackets, the LDR treatment standards for both radioactive lead solids and debris have been met.

Excerpts from 40 CFR 260.10, 268.40, 268.42 and 268.45 are attached to the e-mail. If you have any questions, please contact me at Paul_W_Martin@rl.gov or at (509) 376-6620.

TWO MINUTE TRAINING – ATTACHMENT

SUBJECT: Radioactively Contaminated Lead-Acid Batteries and Hazardous Debris

40 CFR 260.10 Definitions.

Container means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

Tank means a stationary device, designed to contain an accumulation of hazardous waste, which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

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 *[Thermal recovery of lead in secondary lead smelters.]*
	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: Radioactively Contaminated Lead-Acid Batteries and Hazardous Debris

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.

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
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.