



# Superfund Guide To RCRA Management Requirements for Mineral Processing Wastes

Office of Emergency and Remedial Response  
Hazardous Site Control Division OS-220

Quick Reference Fact Sheet

CERCLA remedial actions must comply with (or justify a waiver of) Resource Conservation and Recovery Act (RCRA) requirements when they are “applicable or relevant and appropriate requirements” (ARARs). For RCRA Subtitle C hazardous waste requirements to be applicable, the CERCLA response action must constitute either treatment, storage, transport, or disposal of a RCRA hazardous waste (or a waste management unit being closed as part of a CERCLA response action must contain hazardous waste that was originally disposed after the effective date of RCRA regulation). The determination of whether a CERCLA waste is a RCRA hazardous waste is particularly important for Superfund site managers handling wastes that originally were generated during mineral processing operations, but recently were removed from the mining waste (Bevill) exclusion (RCRA section 3001(b)(3)(A)(ii)) and are now regulated as hazardous wastes. **The purpose of this guide is to summarize recent revisions to the 1980 mining waste exclusion, explain the potential effects of these revisions on waste management options for mineral processing wastes, and provide a general framework for managing mineral processing wastes at CERCLA sites in accordance with RCRA land disposal restrictions (LDRs) and the recently promulgated toxicity characteristics (TC) rule.**

## BACKGROUND

The 1980 mining waste exclusion, RCRA §3001(b)(3)(A)(ii), excluded solid wastes generated in the “extraction, beneficiation, and processing of ores and minerals” from regulation as hazardous waste under the RCRA Subtitle C program, pending the completion of a Report to Congress and a decision by EPA on whether regulation as hazardous waste is warranted. From 1980 through 1989, this exclusion encompassed all “solid waste from the exploration, mining, milling, smelting, and refining of ores and mineral.” A Federal Court of Appeals ruling (*Environmental Defense Fund v. EPA*, 852 F.2d 1316, {D.C. Cir. 1988} *cert. denied*, 109 S.Ct. 1120 (1989)), however, concluded that only mineral processing wastes that are “high volume, low hazard” should be exempted from RCRA Subtitle C regulations under the mining waste exclusion. Therefore, in response to the Court decision, EPA developed definitions for extraction, beneficiation, and mineral processing (see **Highlight 1**) and criteria (54 FR 36592, September 1, 1989) (see **Highlight 2**) for determining if a mineral processing waste stream is “high volume” and “low hazard” to assist in determinations of which mineral processing wastes would continue to be excluded. Based on these definitions and criteria, five wastes were retained under the mining waste exclusion for study in a Report to Congress. In addition, the rule identified 20 other wastes, for which the exclusion was “conditionally retained,”

that required further study before a decision could be made on whether or not they should be excluded from hazardous waste regulation and included in the scope of the Report to Congress. The September 1, 1989 rule also removed all other mineral processing wastes from the exclusion.

EPA promulgated a subsequent rule (55 FR 2322, January 23, 1990) removing five of the remaining 20 “conditional” wastes from the mining waste exclusion. The remaining 15 wastes for which the exclusion had been conditionally retained (by the September 1, 1989 rule) were retained for study in the Report to Congress. Thus, these 15 wastes, along with the five wastes for which the exclusion was retained by the September 1, 1989 rule, comprise the 20 mineral processing wastes that are currently excluded from regulation as hazardous wastes under RCRA. Each of these 20 wastes (see **Highlight 3**) is currently under study by EPA to determine the most appropriate regulatory program. EPA submitted the Report to Congress on July 31, 1990. An Agency decision on which, if any, of these 20 wastes will be subject to Subtitle C is scheduled for early 1991.

In a September 13, 1988 rulemaking (53 FR 35412), six mineral processing wastes that were formerly listed RCRA hazardous wastes (and later exempted from RCRA Subtitle C requirements by the mining waste exclusion) were relisted in response to the court

Highlight 1  
DEFINITIONS OF EXTRACTION,  
BENEFICIATION, AND MINERAL PROCESSING

Extraction is the process of mining and removing ores and minerals from the ground.

Beneficiation is defined as crushing; grinding; washing; dissolution; crystallization; filtration; sorting; sizing; drying; sintering; pelletizing; briquetting; calcining to remove water and/or carbon dioxide; roasting, autoclaving, and/or chlorination in preparation for leaching (except where the roasting (and/or autoclaving and/or chlorination)/leaching sequence produces a final or intermediate product that does not undergo further beneficiation or processing); gravity concentration; magnetic separation; electrostatic separation; floatation; ion exchange; solvent extraction; electrowinning; precipitation; amalgamation; and heap, dump, vat, tank, and in situ leaching. (40 CFR 261.4(b)(7))

Mineral processing operations are operations that

- follow beneficiation of an ore or mineral (if applicable);
- serve to remove the desired product from an ore or mineral, or enhance the characteristics of ores or minerals or beneficiation ores or minerals;
- use mineral-value feedstocks that are comprised of less than 50 percent scrap materials;
- produce either a final mineral product or an intermediate to the final product; and
- do not combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying), do not involve fabrication or other manufacturing activities, and do not involve further processing of a marketable product of mineral processing. (A listing of criteria is provided in the preamble to the September 1, 1989 rulemaking, 54 FR 36592).

Highlight 2  
HIGH VOLUME AND LOW HAZARD DEFINITIONS

EPA defines “high volume” mineral processing wastes as:

- (1) non-liquid mineral processing wastes that were generated at an average annual rate of greater than 45,000 metric tons per year per facility, and
- (2) liquid mineral processing wastes that were generated at an average annual rate of more than 1,000,000 metric tons per year per facility during any year between 1983 and 1998 (see 54 FR 36629).

A high volume mineral processing waste is not “low hazard” if samples of the waste from two or more facilities fail the Synthetic Precipitation Leaching Procedure (SPLP) Test or the pH Test (see 54 FR 36630).\*

\* NOTE: The SPLP and pH tests are not related to the TCLP test.

In July, 1990, a Federal Court of Appeals ruling remanded the listings of five of these wastes (*AMC v. EPA*, 31 ERC 1935). At this time, K088 is the only one of these six wastes that is a listed RCRA hazardous waste; the other five wastes are RCRA hazardous wastes only if they exhibit one or more of the RCRA hazardous waste characteristics.

## RCRA WASTE DETERMINATIONS

In order to ensure that Superfund response actions comply with applicable RCRA requirements, site managers first need to know if RCRA hazardous wastes are present at the site. The determination of whether RCRA wastes are present at mining or smelting sites is affected by the two mineral processing waste regulations discussed above. If a mineral processing waste (except the 20 wastes currently under study) is transported, treated, stored, or disposed of as part of a CERCLA response action, it is subject to hazardous waste regulations under RCRA Subtitle C if it meets the definition of a RCRA hazardous waste (i.e., is listed or exhibits a characteristic).

EPA recently promulgated the toxicity characteristics (TC) rule, which may affect when mineral processing wastes are hazardous wastes. The TC rule (55 FR 11798, March 29, 1990), which took effect on September 25, 1990, replaces the extraction procedure (EP) with the Toxicity Characteristic Leaching Procedure (TCLP) test to define when a waste is hazardous by characteristic. The TC also adds an additional 25 regulated constituents (all of which are organics) to the 14 constituents previously regulated under the EP toxicity test (see *CERCLA Compliance with the RCRA Toxicity Characteristics (TC) Rule, Part II*, Publication 9347.3-11FS).

decision in *EDF v EPA* as RCRA hazardous wastes. These wastes are:

- K064 Acid plant blowdown slurry/sludge resulting from the thickening of blowdown slurry from primary copper production
- K065 Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities
- K066 Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production
- K088 Spent potliners from primary aluminum reduction
- K090 Emission control dust or sludge from ferrochromiumsilicon
- K091 Emission control dust or sludge from ferrochromium production

### Highlight 3

#### MINERAL PROCESSING WASTES CURRENTLY RETAINED UNDER THE MINING WASTE EXCLUSION

##### Mineral Processing Wastes

##### Commodity sector

* Red and brown muds from bauxite refining .....	Alumina
Gasifier ash from coal gasification .....	Coal Gasification
Process wastewater from coal gasification	
Calcium sulfate WWT plant sludge from primary copper processing .....	Copper
* Slag from primary copper processing	
Slag tailings from primary copper processing	
* Slag from elemental phosphorous production .....	Element Phosphorous
Fluorogypsum from hydrofluoric acid production .....	Hydrofluoric Acid
Process wastewater from hydrofluoric acid production	
Air Pollution Control (APC) dust/sludge from iron blast furnaces .....	Iron
Iron blast furnace slag	
* Slag from primary lead processing .....	Lead
Process wastewater from primary magnesium processing by the anhydrous process .....	Magnesium
* Phosphogypsum from phosphoric acid production .....	Phosphoric Acid
Process wastewater from phosphoric acid production	
Treated residue from roasting/leaching of chrome ore .....	Sodium Chromate/Bichromate
Basic Oxygen Furnace (BOF) and Open Hearth Furnace (OHF) APC dust/sludge from carbon steel production .....	Steel
BOF and OHF slag from carbon steel production	
Chloride process waste solids from titanium tetrachloride production .....	Titanium Tetrachloride
Slag from primary zinc processing .....	Zinc
* Original five wastes retained under the exclusion in the September 1, 1989 rule. The remaining 15 wastes were retained in the January 23, 1990 rule. All other mineral processing wastes are subject to Subtitle C regulation if they are hazardous waste by listing or characteristic.)	

As with the EP, site managers are not required to test wastes to determine if they exhibit the toxicity characteristic based on the TCLP; knowledge of the wastes may be sufficient. Specific knowledge of Superfund wastes may not be available in many cases, and testing may be necessary to make this determination. In general, mineral processing wastes that did not exhibit the toxicity characteristic based on the EP test also would be expected not to exhibit the toxicity characteristic using the TCLP test. However, in limited cases, wastes that were not hazardous under the EP may be hazardous under the TCLP, and site managers will need to base decisions on whether to “retest” on previous results and site-specific factors.

At sites where RCRA hazardous waste requirements may not be applicable (e.g., listed or characteristically hazardous mineral processing wastes are not known to be present), site managers still must determine if the requirements are relevant and appropriate (based on the factors discussed in the NCP preamble, see 55 FR 8743 and 8763). [NOTE: In some circumstances, RCRA requirements may be relevant and appropriate to mining wastes that have been excluded from RCRA (or are under review).]

## RCRA WASTE MANAGEMENT

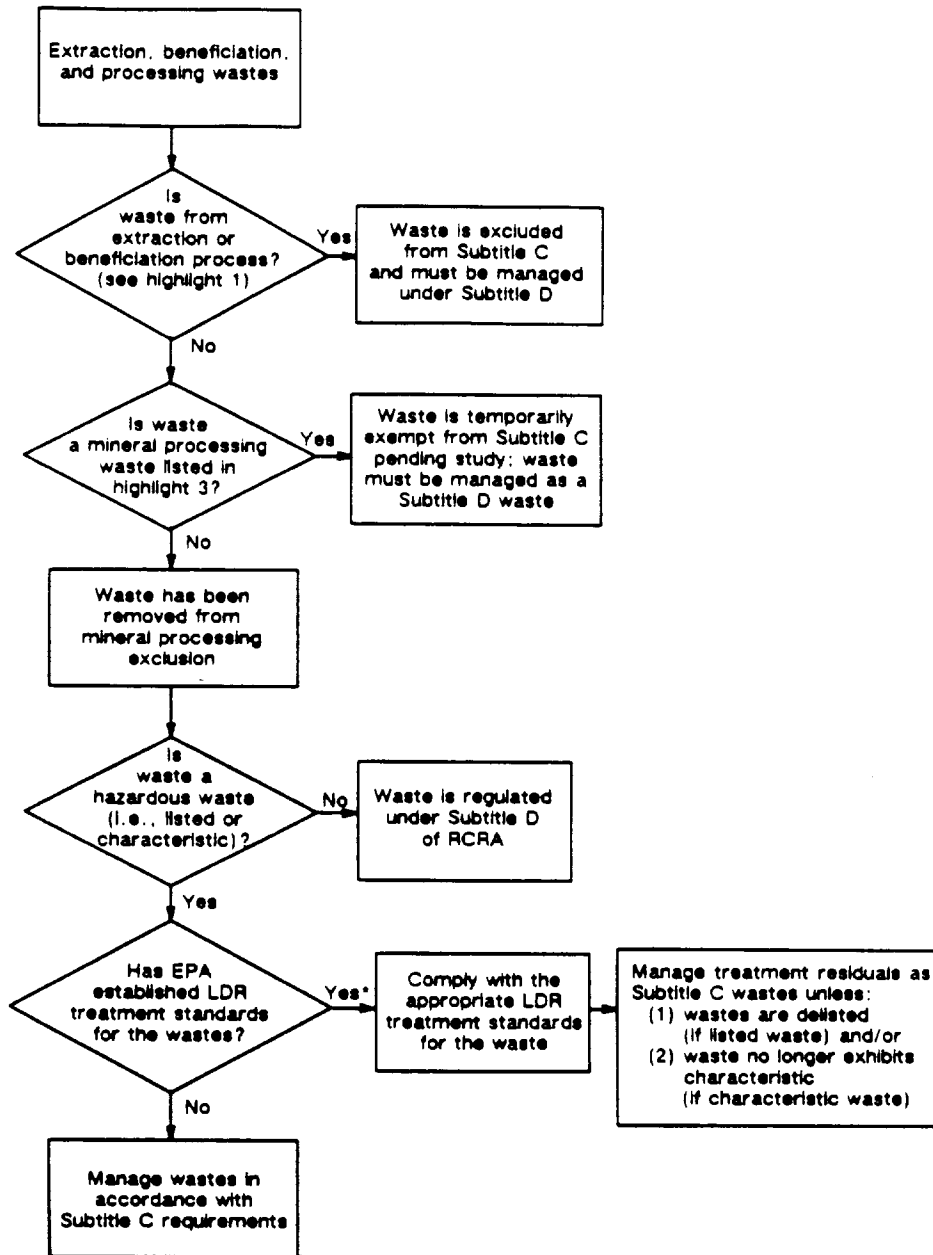
Mineral processing wastes other than those listed in **Highlight 3** (i.e., wastes removed from the mining waste exclusion) would have to exhibit the toxicity

characteristic, one of the other three characteristics (ignitability, corrosivity, or reactivity) or be listed as hazardous waste, before being regulated under Subtitle C. [Note: Solid wastes that still are excluded from Subtitle C regulation, such as extraction or beneficiation wastes, or that do not exhibit a characteristic and are not listed, must be managed in accordance with Subtitle D of RCRA.]

Mineral processing wastes that have been removed from the mining waste exclusion and are determined to be hazardous are subject to Subtitle C requirements in those states that do not have authorization to administer their own hazardous waste program (i.e., non-authorized RCRA states). Generators, transporters, and treatment, storage, and disposal facilities in authorized states will be subject to RCRA requirements only after the state revises its program to reflect the changes in Federal regulations and EPA authorizes the revision. (Of course, the requirements will be applicable as state law if the state law is effective prior to authorization.) The rule is not effective automatically in authorized states because it is not required as part of the Hazardous and Solid Waste Amendments (HSWA) of 1984 (the provisions of which are effective in all states once promulgated by EPA).

All mineral processing wastes that now are considered RCRA hazardous wastes (i.e., non-excluded mineral processing wastes that are characteristic or listed) are considered to be “newly identified” wastes and will not have treatment standards under the land

# Summary of Mining Waste Exclusion



\* As of this time, EPA has not set LDR treatment standards for any mineral processing wastes removed from the Mining Waste Exclusion

disposal restrictions (LDRs) until EPA completes a separate LDR rulemaking. Furthermore, no other LDR restrictions (e.g., soft hammer requirements, California list requirements) apply to these newly identified wastes. However, formerly excluded mineral processing wastes

that now are considered hazardous must be disposed of in accordance with other Subtitle C requirements (e.g., in a regulated Subtitle C disposal unit) unless they are delisted or treated to remove the characteristic(s) that make them hazardous.

**NOTICE:** The policies set out in this memorandum are intended solely as guidance. They are not intended, nor can they be relied upon, to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided in this memorandum, or to act at variance with the guidance, based on an analysis of specific site circumstances. The Agency also reserves the right to change this guidance at any time without public notice.