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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 261 and 262

[SWH-FRL-3699-3; EPA/OSW-FR-90-013]

Mining Waste Exclusion; Section 3010 Notification for Mineral Processing Facilities; Designated Facility Definition; Standards Applicable to Generators of Hazardous Waste

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: Today's final rule removes five of 20 conditionally retained mineral processing wastes from the exemption from hazardous waste regulations provided by section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery Act (RCRA), often referred to as the Bevill exclusion. The five wastes removed from the Bevill exclusion by today's final rule are: Furnace off-gas solids from elemental phosphorus production, process wastewater from primary lead processing, air pollution control dust/sludge from lightweight aggregate production, sulfate process waste acids from titanium dioxide production, and sulfate process waste solids from titanium dioxide production. Wastes removed from the exclusion are subject to hazardous waste regulations if they are found to exhibit a hazardous characteristic or are otherwise identified or listed as hazardous.

Three wastes previously proposed on September 25, 1989 (54 FR 39298), for removal from the Bevill exclusion are retained under the exclusion by this final rule. Those three wastes are: (1) Treated residue from roasting/leaching of chrome ore; (2) process wastewater from coal gasification; and (3) process wastewater from hydrofluoric acid production. The Bevill exclusion also is retained for 12 of the original 13 other conditionally retained wastes, which will be addressed, along with 5 other wastes in a Report to Congress and subsequent Regulatory Determination by January 31, 1991.

Today's rule makes technical corrections to the definition of "beneficiation" that was promulgated on September 1, 1989 (54 FR 36592) and also waives the RCRA Section 3010 notification deadline for mineral processing facilities that are located in authorized states and that generate wastes removed from the exclusion in the September 1, 1989 final rule. Because of confusion expressed by the regulated community in response to statements made in the preamble of the September 1 rule, today's rule also extends the

RCRA Section 3010 notification deadline for mineral processing facilities that are located in unauthorized states and that generate wastes removed from the exclusion by the September 1, 1989 final rule. Notification will now be required in unauthorized states by April 23, 1990.

Today's final rule also amends the RCRA Subtitle C definition of "designated facility" and the standards applicable to generators of hazardous waste to clarify the requirements for completing hazardous waste shipment manifests for transporting wastes from one state where they are regulated as hazardous to another in which they are not regulated as hazardous.

DATES: Effective Date: July 23, 1990. Not later than April 23, 1990, all persons in unauthorized states who generate, transport, treat, store, or dispose of wastes removed from temporary exclusion by this rule or the September 1, 1989 final rule and which are characteristically hazardous under 40 CFR part 261, subpart C, must notify EPA of these activities pursuant to section 3010 of RCRA.

See sections V and VI of the preamble below for additional dates and details.

FOR FURTHER INFORMATION, CONTACT: RCRA/Superfund Hotline at (800) 424-9348 or (202) 382-3000, or for technical information contact Dan Derkics or Bob Hall, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, (202) 382-3808, or (202) 475-8814, respectively.

SUPPLEMENTARY INFORMATION:

Table of Contents

- I. Introduction
 - A. Context
 - B. Overview of Today's Rule
 - C. Future Activities
- II. Analysis of and Response to Public Comments on Bevill Status of 20 Mineral Processing Wastes Proposed on September 25, 1989
 - A. General Comments on EPA's Application of the Final Bevill Criteria
 - B. Comments on the 13 Waste Streams Proposed for Retention
 - C. Comments on the Seven Wastes Proposed for Removal
 - D. Relationship of the Proposed Rule to Subtitle C of RCRA
 - E. Costs and Impacts of the Proposed Rule
 - F. Requests for Clarifications/Technical Corrections on the September 1, 1989, Final Rule
 - G. Concerns with Administrative Procedure
- III. Revised Application of the Final Criteria for Defining Bevill Mineral Processing Wastes
 - A. Clarification of Waste Stream Definitions
 - B. Compliance with the High Volume Criterion
 - C. Compliance with the Low Hazard Criterion

- D. Bevill Status of Conditionally Retained Mineral Processing Wastes
- IV. Analysis of and Response to Comments on Clarification to the Definition of "Designated Facility" and Modification of the Standards Applicable to Generators of Hazardous Waste
 - A. General Comments on the Proposed Definition
 - B. Relationship Between Today's Clarification and Non-RCRA State Hazardous Wastes
 - C. Who Can Qualify as a Designated Facility?
 - D. Which Standards Apply to Interstate Shipments
 - E. Other Comments
 - F. Manifesting Requirements
- V. Regulatory Implementation and Effective Dates of the Final Rule
 - A. Section 3010 Notification
 - B. Compliance Dates for Today's Rule
- VI. Effect on State Authorizations
- VII. Economic Impact Screening Analysis Pursuant to Executive Order 12291
 - A. Approach
 - B. Aggregate and Sector Compliance Costs
 - C. Economic Impacts
- VIII. Regulatory Flexibility Analysis
- IX. List of Subjects in 40 CFR 260, 261 and 262

I. Introduction

A. Context

Section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery Act (RCRA) temporarily excludes "solid waste from the extraction, beneficiation, and processing of ores and minerals" from regulation as hazardous waste under Subtitle C of RCRA, pending completion of certain studies by EPA. In 1980, EPA temporarily interpreted this exclusion, often referred to as the Bevill exclusion, to encompass "solid waste from the exploration, mining, milling, smelting and refining of ores and minerals" (45 FR 76619, November 19, 1980).

In response to the decision of the District of Columbia Circuit Court of Appeals in *Environmental Defense Fund v. EPA*, 852 F.2d 1316, (D.C. Cir. 1988), cert. denied, 109 S.Ct. 1120 (1989), EPA proposed criteria by which mineral processing wastes would be evaluated for continued exclusion from hazardous waste regulation until the required studies and subsequent regulatory determination was made. On September 1, 1989 (see 54 FR 36592), EPA provided the final Bevill exclusion criteria. Twenty mineral processing wastes were conditionally retained within the scope of the Bevill exclusion pending the analysis of newly collected data. The Bevill exemption was retained for the following five mineral processing wastes, which will be studied in a Report to Congress.

- 1. Slag from primary copper processing.

US EPA ARCHIVE DOCUMENT

2. Slag from primary lead processing.
3. Red and brown muds from bauxite refining.
4. Phosphogypsum from phosphoric acid production.
5. Slag from elemental phosphorus production.

All of the other mineral processing wastes that were permanently removed from the Bevill exclusion by the September 1, 1989 rule are subject to RCRA Subtitle C regulation if they are solid wastes and exhibit one or more of the characteristics of hazardous waste as defined in 40 CFR part 261 or are otherwise listed as hazardous waste.

On September 25, 1989 (54 FR 39298), EPA reevaluated the status of the 20 conditionally retained wastes. Applying the high volume and low hazard criteria contained in the September 1, 1989 final rule, the Agency proposed to permanently remove seven mineral processing wastes from the Bevill exclusion and retain 13 other mineral processing wastes within the exclusion for study in a Report to Congress. The seven mineral processing wastes proposed for removal from the Bevill exclusion were:

1. Roast/leach ore residue from primary chromite production;
2. Process wastewater from coal gasification;
3. Furnace off-gas solids from elemental phosphorus production;
4. Process wastewater from hydrofluoric acid production;
5. Process wastewater from primary lead processing;
6. Sulfate process waste acids from titanium dioxide production; and
7. Sulfate process waste solids from titanium dioxide production.

The 13 mineral processing wastes proposed for temporary retention in the Bevill exclusion were:

1. Gasifier ash from coal gasification;
2. Calcium sulfate wastewater treatment plant sludge from primary copper processing;
3. Slag tailings from primary copper processing;
4. Fluorogypsum from hydrofluoric acid production;
5. Air pollution control dust/sludge from iron blast furnaces;
6. Iron blast furnace slag;
7. Air pollution control dust/sludge from lightweight aggregate production;
8. Process wastewater from primary magnesium production by the anhydrous process;
9. Process wastewater from phosphoric acid production;
10. Basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production;
11. Basic oxygen furnace and open hearth furnace slag from carbon steel production;
12. Chloride process waste solids from titanium tetrachloride production; and
13. Slag from primary zinc processing.

The September 25, 1989 notice also proposed to modify the RCRA subtitle C definition of "designated facility" for purposes of clarifying the requirements for completing hazardous waste manifests for wastes transported from one State where they are regulated as hazardous to another in which they are not regulated as hazardous. Under the proposed modification, if a waste is sent to an authorized State where the waste is not regulated as hazardous, then the designated facility must be a facility allowed by the State to accept the waste. The Agency solicited public comments on the appropriateness of these modifications as well as on the data used to make the proposed Bevill exclusion decisions.

B. Overview of Today's Rule

Today's final rule establishes the status of 20 mineral processing wastes which were proposed either for removal from or retention in the Bevill exclusion in the September 25, 1989 notice of proposed rulemaking (NPRM). In addition, today's rule contains technical corrections to the September 1, 1989 final rule. Furthermore, today's final rule also promulgates a clarification to the definition of "designated facility" that the Agency proposed on September 25, 1989.

This final rule completes the rulemaking regarding the Bevill status of mineral processing wastes until the completion of the required report to Congress and Regulatory Determination. In establishing the current status for these 20 mineral processing wastes, the Agency has considered information presented in public comment on the September 25 proposal together with additional analysis of previous EPA industry survey and field data and, where appropriate, has modified the decisions.

As in the September 25 proposal, the Agency evaluated the 20 mineral processing wastes by applying the high volume and low hazard criteria contained in the September 1, 1989 final rule, using a three-step process. First, the Agency applied the high volume criteria to the available waste generation data. For each waste, the Agency obtained facility-specific annual waste generation rates for the period 1983-1988 and calculated the highest average annual facility-level generation rate. Mineral processing wastes generated above the volume criteria thresholds (an average rate of 45,000 metric tons per facility for non-liquid wastes, and 1,000,000 metric tons for liquid wastes) passed the high volume criterion.

In the second step, the Agency evaluated each of the 20 wastes with respect to the low hazard criterion using the relevant waste characteristics. EPA considered a waste to pose a low hazard only if the waste passed both a toxicity test (Method 1312) and a pH test.

The third step involved consolidating the results from the first two steps to determine the appropriate Bevill status of the 20 conditionally retained mineral processing wastes. Applying these criteria, the Agency is today removing the Bevill exclusion for the following five mineral processing wastes:

1. Furnace off-gas solids from elemental phosphorus production.
2. Process wastewater from primary lead processing.
3. Air pollution control dust/sludge from lightweight aggregate production.
4. Sulfate process waste acids from titanium dioxide production.
5. Sulfate process waste solids from titanium dioxide production.

The following 15 mineral processing wastes are to be retained within the exclusion (in addition to the five already retained in the September 1 rule), pending preparation of a Report to Congress and the subsequent Regulatory Determination:

1. Treated residue from roasting/leaching of chrome ore;
2. Gasifier ash from coal gasification;
3. Process wastewater from coal gasification;
4. Calcium sulfate wastewater treatment plant sludge from primary copper processing;
5. Slag tailings from primary copper processing;
6. Fluorogypsum from hydrofluoric acid production;
7. Process wastewater from hydrofluoric acid production;
8. Air pollution control dust/sludge from iron blast furnaces;
9. Iron blast furnace slag;
10. Process wastewater from primary magnesium production by the anhydrous process;
11. Process wastewater from phosphoric acid production;
12. Basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production;
13. Basic oxygen furnace and open hearth furnace slag from carbon steel production;
14. Chloride process waste solids from titanium tetrachloride production; and
15. Slag from primary zinc processing.

Today's rule also contains technical corrections to the September 1, 1989 final rule. The Agency's review of the final rule, as well as public comments, revealed slight differences between portions of the regulatory language and the corresponding discussion in the preamble. As a result, today's rule includes minor editorial changes to the

language of September 1 final rule. These changes are fully described in Section II.

In addition, EPA is promulgating a clarification to the definition of "Designated Facility" as defined in 40 CFR 260.10. The Agency is amending this definition for purposes of clarifying the requirements for completing hazardous waste manifests for wastes transported from one State where they are regulated as hazardous to another in which they are not regulated as hazardous. Today's clarification allows such generators to ship the waste to a facility in an authorized State in which the waste is not yet regulated as hazardous, as long as the facility receiving the wastes is allowed by the State to receive the waste. This rule also clarifies that it is the responsibility of the generator to assure that any out-of-state transporter and designated facility sign the manifest form that accompanies the waste shipment.

C. Future Activities

This rule establishes the boundaries of the temporary exclusion from hazardous waste regulations for mineral processing wastes provided by RCRA section 3001(b)(3)(A)(ii). All 20 mineral processing wastes for which the Bevill exclusion has been retained will be subject to detailed study by EPA.¹ The findings of these studies will be contained in a Report to Congress that will be submitted by July 31, 1990.

Six months after submission of this report, the Agency will publish a Regulatory Determination stating whether or not any of the studied wastes will be regulated under Subtitle C of RCRA as hazardous wastes, or that such regulation is unwarranted.

II. Analysis of and Response to Public Comments on Bevill Status of 20 Mineral Processing Wastes Proposed on September 25, 1989

This section summarizes and discusses the comments received on the September 25, 1989 proposal. In general, this discussion is limited to the issues germane to the September 25th proposal. Comments on other issues are not discussed here, except in a few instances where the Agency believes it is important to restate its position to avoid confusion or misunderstanding in the regulated community. The Agency did review all of the comments received, however, and comments not discussed

here are summarized in a background document in the docket.

A. General Comments on EPA's Application of the Final Bevill Criteria

1. Sources of Volume and Hazard Data

a. *Volume Data.* One commenter argued that the volume data supporting the proposed determinations of whether proposed waste streams are high volume lack adequate verification. Specifically, the commenter contended that tremendous discrepancies are evident between the data provided by commenters and the data reported from the 1989 National Survey of Solid Wastes from Mineral Processing Facilities for the following four waste streams: Coal gas process wastewater, elemental phosphorous furnace off-gas solids, lead process wastewater, and titanium dioxide sulfate process waste solids.

EPA agrees that some of the data reported in the comments and the data from the surveys that were used in developing waste volume estimates for the proposal are not in close agreement. As a result, in developing today's rule, the Agency has relied almost exclusively on data collected in the 1989 National Survey of Solid Wastes from Mineral Processing Facilities, which was conducted under RCRA Section 3007 authority, under the assumption that the various respondents realize that submission of false data is a punishable offense. The Agency believes that these are the most recent and accurate data available.

Additional analysis of responses to the surveys, carried out in response to these comments, has indicated some variability in the way in which respondents interpreted the survey instructions. In developing the proposed rule, EPA relied primarily on the responses to survey question 2.11 ("How much of the special waste did this processing unit generate in 1988?") to derive the average facility waste volumes. Additional review of the survey responses has indicated that in some instances the volume data that the Agency expected to be reported in response to question 2.11 were in fact reported in other sections of the questionnaire that requested information related to waste treatment plants, surface impoundments and other waste management units (i.e., sections 4 through 6.)²

² This occurs most often for the five wastes that are covered by this rulemaking for which data were not specifically requested in the survey. Apparently, a number of facility operators either neglected to read, misunderstood, or ignored the instruction to provide information on way waste that they

As a consequence, EPA has been careful to select the response to the appropriate survey question (which sometimes is not question 2.11) in developing today's final rule. For example, the appropriate waste volume data were sometimes provided in response to question 4.18 ("What was the quantity of sludge/solid outflows from this wastewater treatment plant in 1988?"), question 5.6 ("Approximately how much of the total amount of accumulated sludge/solids in this surface impoundment on December 31, 1988 was added during 1988?"), or question 6.4 ("What were the inflows to this waste management unit and what was the quantity of each inflow in 1988?"). In those cases where responses to questions contained in sections 4 through 6 of the survey have been selected for use by the Agency, the responses are in much better agreement with the data provided in comments. In a number of cases, as discussed more fully in section III, below, estimated waste generation rates have been revised, and in fact, in a few instances, the Agency's evaluation of whether particular waste streams comply with the high volume criterion has been reversed. Documentation addressing the Agency's calculation of waste volumes can be found in the docket supporting this final rule.

The commenter also criticized the Agency for liberally granting Confidential Business Information (CBI) designations to responses submitted by industry respondents to the National Survey. These designations, they claimed, have impeded independent verification of the volume data, noting that for residue from roasting/leaching of chrome ore and titanium dioxide sulfate process waste acids, all of the facilities generating these waste streams designated their relevant survey data as CBI. The commenter stated that if the public is unable to scrutinize these data because of their confidentiality, then the Agency should make a professional verification of the information provided.

Under the provisions of section 3007 of RCRA, facilities providing information to EPA can designate information, in whole or in part, as CBI. EPA has not automatically granted claims for CBI status. Rather, EPA reviewed the CBI claims made for data submitted by mineral processing facilities in support of this rulemaking and, when claims for CBI status appeared excessive, requested, often successfully, that the CBI claims be

considered eligible for Bevill status, irrespective of whether it was on EPA's preliminary list.

¹ These include the five wastes for which the temporary exclusion was retained in the September 1, 1989 final rule and the 15 wastes for which the exclusion is retained in today's rule.

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reduced or eliminated. In addition, EPA has included aggregated CBI data in the publicly available documentation supporting the development of today's rule to the extent that this could be done without revealing company-specific CBI information.

As discussed above, facilities that submit either CBI or non-CBI data requested by EPA under RCRA 3007 authority are subject to enforcement action if they submit false data. As a result, the Agency believes that data collected under Section 3007 authority can be relied upon without additional verification, regardless of whether it is CBI or not. In addition, as a practical matter, the schedule required by the Appeals Court for this rulemaking did not provide the time needed to conduct such verification.

One commenter stated that for some of the wastes of interest, EPA volume determinations are based on a fraction of those facilities generating the waste. As a result, the commenter contends, EPA lacks a sufficient basis for determining whether proposed wastes meet the high volume criterion. In instances where EPA lacks data on more than 25 percent of the facilities generating the waste, the commenter believes that EPA should not make a volume determination without determining whether the facilities providing the volume data are representative of the industry; the agency should also attempt to obtain data on the remaining facilities. The commenter maintained that in the absence of survey data, EPA should not rely completely upon data provided in public comments.

EPA responds that, as discussed above and in more detail in Section III of this preamble, further analysis of the survey data has shown that the survey responses do in fact provide adequate waste volume data for all but one of the 10 mineral processing wastes covered by today's rulemaking. With the exception of this one waste, waste volume data are available in the survey for far more than 25 percent of the facilities generating the waste. For the one waste with limited data available in the survey, basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production, data provided by the American Iron and Steel Institute (AISI) were used for the volume determination. These data were verified through comparison with the survey data that were provided for several of the facilities for which AISI also provided volume data.

b. Hazard Data. Several commenters argued that the Agency used too few

samples, especially when results were inconsistent, or neglected to sample inactive facilities for determining the hazard of waste streams. As a result, the commenters argued, the samples were not representative of the entire industry. Other commenters contended that many inconsistencies in the waste sampling data were overlooked in making proposed exclusion decisions.

EPA responds that, as clearly stated in the September 25, 1989 NPRM, the low hazard criterion was established in the September 1, 1989 final rule and is not subject to public comment at this time. For further discussion of the development and application of the low hazard criterion, refer to 54 FR 36592. In applying the final Bevill low hazard criterion, EPA has not ignored any apparent inconsistencies or widely varying concentrations. The low hazard criterion is applied using the lower 80 percent confidence interval that, as a practical matter, allows for one or more samples to exhibit contaminant concentrations above relevant standards, without disqualifying the waste for Bevill status. Inactive facilities were not sampled because they are affected by today's rulemaking only if in the future they resume operation or actively manage historical accumulations of wastes for which the Subtitle C exemption is being removed by today's rule. The Agency believes that it would be inappropriate and impractical to consider these speculative future activities in developing today's rule. (For further discussion see 54 FR 36595-36597.)

Another commenter disputed EPA's use of data submitted by waste generators for the low hazard determinations, stating that the use of these data contradicts the criteria set in the September 1, 1989 rule.

As explained in the preamble to the September 1, 1989 final rule, EPA established that low hazard determinations are to be based on EPA Method 1312 data unless

- i. The waste is generated at five or more facilities; and
- ii. Substantial additional relevant data are available and the preponderance of these additional data indicate that the waste should be considered low hazard, where:
 - a. Relevant data are defined as data that result from analysis of waste extracts obtained by EPA Methods 1310, 1311, and 1312, ASTM Test Method D3987-81, or comparable procedures that Agency has reason to believe produce reliable and representative data; and
 - b. To be considered substantial, the additional data must characterize the waste at 3 plants (other than those two plants where Method 1312 results exceed 100 times the MCLs) or at least half of the facilities that

generate the waste (other than those two plants where Method 1312 results exceed 100 times the MCLs), whichever number of plants is larger. (54 FR 36630)

The Agency wishes to point out that there is no explicit or implicit assumption in this low hazard criterion about the source of the data that the Agency is to use in making low hazard determinations. Accordingly, EPA has used available Method 1312 data regardless of source (e.g., EPA, industry) in making low hazard determinations in today's rule (and, indeed, the September 25, 1989 proposal).

B. Comments on the 13 Waste Streams Proposed for Retention

This section discusses comments received on each of the 13 mineral processing wastes for which EPA proposed to retain the Bevill exemption. The comments received on each of the wastes generally are presented under one of three subheadings: Processing Criterion/Waste Definition, Volume, or Hazard. These subheadings appear only when they are relevant to comments identified for the waste being discussed, so for many of the 13 wastes, one or more of the subheadings are not included.

1. Gasifier Ash From Coal Gasification

One commenter supported EPA's proposed retention of gasifier ash from coal gasification within the Bevill exclusion.

2. Calcium Sulfate Wastewater Treatment Plant Sludge From Primary Copper Processing

One commenter agreed with EPA's proposed determination that calcium sulfate wastewater treatment plant sludges from primary copper processing are high volume, low hazard materials and, thus, qualify for the Bevill exclusion and further study.

a. Processing Criterion/Waste Definition. One commenter asserted that no rational basis exists for distinguishing between calcium sulfate and sodium hydroxide sludges, arguing that both are generated in identical treatment plants, and both are reprocessed in the primary copper processing operation to recover additional copper. The commenter indicated that the only difference between the two sludges is the type of reagent used (lime or sodium hydroxide) to neutralize acidic aqueous streams that enter the treatment plants. The commenter reasoned that the only explanation for this disaggregation is the amount of sludge resulting from use of the different neutralizing reagents.

The Agency has considered the comment and finds these arguments unconvincing. EPA believes that the type of reagent used is an important factor in determining the chemical nature and quantity of the sludge generated. As explained in the preamble to the April, 1989 proposed rule (54 FR 15316), EPA believes that there are significant differences between these materials, and accordingly, has retained this distinction in today's final rule.

b. Volume. Three commenters addressed the volume data for this waste. One commenter agreed with EPA's determination that calcium sulfate wastewater treatment plant sludge meets the high volume criterion. Another commenter contended that all wastewater treatment plant sludge from primary copper processing should be studied under the Bevill Amendment. If the generation rates for calcium sulfate and sodium hydroxide sludges are added, they noted, the resulting average is above the 45,000 metric ton per year cutoff. The third commenter claimed that public comment data submitted by waste generators and survey data for those same wastes are not consistent. The third commenter noted that, in public comments, industry submitted an average annual generation rate for calcium sulfate wastewater treatment plant sludge from primary copper processing of 75,750 MT/yr (comments of Kennecott Utah Copper on October 20, 1988 NPRM), while according to EPA's survey data, the average generation rate for this waste stream was 1,179,341 MT/yr. Because these data are not in agreement, the third commenter concluded that all of the volume data are suspect, especially when EPA had previously estimated an annual generation rate of 38,033 MT/yr, a volume that would not have supported a high volume determination.

The Agency agrees that the volume data cited by the commenter appear to be inconsistent. The Agency has reviewed the survey data and found that these apparent inconsistencies arise from the fact that appropriate waste volume data sometimes were reported in sections 3 through 6 of the questionnaire, rather than section 2, which was used to develop average volume data for the proposed rule. As a result, these differences have since been resolved and are explained in Section III, below, and a background document in the docket, which present the Agency's revised waste generation estimates. Finally, EPA's previous volume estimate of approximately 38,000 MT/yr average per facility was based on an aggregation of calcium sulfate and

sodium hydroxide sludge, which the Agency has concluded is inappropriate.³

c. Hazard. Two commenters addressed the hazard level of calcium sulfate wastewater treatment plant sludge from primary copper processing. One agreed with EPA's proposed determination that the waste meets EPA's low hazard criterion. However, another commenter asserted that EPA's sampling data demonstrated that calcium sulfate wastewater treatment sludge from primary copper processing exhibits the hazardous waste characteristic of EP-toxicity for arsenic, cadmium, and selenium, and questioned why it was not proposed for removal from the Bevill exclusion on that basis alone.

EPA finalized the low hazard criterion in the September 1, 1989 rule, and is not entertaining comments on it. The Agency's rationale for the low hazard criterion is outlined in 54 FR 36592. As discussed in the September 25, 1989 proposal, the waste does not exhibit levels of toxic constituents above those established by the September 1, 1989 final rule.

3. Slag Tailings From Primary Copper Processing

Two commenters supported EPA's proposed retention of slag tailings from primary copper processing for further study, asserting that EPA properly determined the waste to be high volume and low hazard.

a. Processing Criterion/Waste Definition. One commenter stated that at its facility, slag tailings are produced when the ore input to the mill is supplemented with slag from the facility's primary copper smelting operations. Because the slag tailings cannot be differentiated from the ore tailings, the commenter argues that the Bevill exemption, as either a processing waste or a beneficiation waste, should be retained for the slag tailings.

While EPA plans to study copper slag tailings in a report to Congress, EPA disagrees with the commenter's contention that the fact that the waste is generated in combination with a beneficiation waste is relevant to the decision that inclusion in the report to Congress is appropriate. The Agency has decided to include this waste in the report to Congress because it is a

³ Available data indicate that sludge resulting from treatment of wastewaters from primary copper processing using sodium hydroxide is generated in much smaller volumes than calcium sulfate sludges resulting from treatment with lime. As a result, an average annual sludge volume that includes both types of sludges is significantly lower than one that is based only on calcium sulfate sludge.

mineral processing waste that is both high volume and low hazard according to the criteria previously established. The Agency will, however, examine the current practices that involve co-management of a beneficiation waste and a mineral processing waste in the report to Congress.

b. Volume. Three commenters concurred that slag tailings from primary copper processing meet EPA's high volume criterion. One commenter submitted complete volume data for this waste stream in the Survey, stating that it generates more than a million metric tons per year of the waste stream. Another commenter claimed that about 3,700,000 short tons of tailings, of which approximately 22,000 short tons were slag tailings, were generated by its facility.

4. Air Pollution Control Dust/Sludge From Iron Blast Furnaces

One commenter asserted that the Agency's proposal for retention of iron and steel industry wastes within the Bevill exclusion is fully supported by the data. These wastes are mineral processing wastes, and they meet the criteria as high volume, low hazard wastes.

5. Iron Blast Furnace Slag

One commenter asserted that the Agency's proposal for retention of iron and steel industry wastes within the Bevill exclusion is fully supported by the data. These wastes are mineral processing wastes, and they meet the criteria as high volume, low hazard wastes.

6. Basic Oxygen Furnace and Open Hearth Furnace Air Pollution Control Dust/Sludge From Carbon Steel Production

One commenter asserted that the Agency's proposal for temporary retention of iron and steel industry wastes within the Bevill exclusion is fully supported by the data. These wastes are mineral processing wastes, and they meet the criteria as high volume, low hazard wastes.

One commenter argued, however, that EPA's volume data is incomplete, because for some wastes, the volume determinations are based on only a fraction of the facilities generating the waste. In the case of basic oxygen and open hearth furnace APC dust/sludge from carbon steel production, the commenter maintained that EPA based its volume determination on data from only four of 27 facilities. The commenter argued that the Agency made no effort to determine if these few facilities were

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representative of the industry in general, or if the facilities were unusually large or small and would skew the data.

In response to this comment, EPA has carefully reviewed all data available from the industry survey and from other sources. The Agency's revised waste generation estimate (presented in Section III, below), is based upon data obtained from the vast majority of active carbon steel facilities. These data show that this is a high volume waste.

7. Basic Oxygen Furnace and Open Hearth Furnace Slag From Carbon Steel Production

One commenter asserted that the Agency's proposal for temporary exclusion of iron and steel industry wastes within the Bevill exclusion is fully supported by the data. These wastes are mineral processing wastes, and they meet the criteria as high volume, low hazard wastes.

Fluorogypsum From Hydrofluoric Acid Production

a. Volume. One commenter agreed with EPA's proposed determination that fluorogypsum from hydrofluoric acid production meets the high volume criterion.

b. Hazard. One commenter agreed with EPA's proposed determination that fluorogypsum meets the low hazard criterion.

Air Pollution Control Dust/Sludge from Lightweight Aggregate Production

a. Volume. One commenter argued that EPA's volume data are incomplete. Because for this waste, the volume determination was based on only a fraction of the facilities generating the waste. The commenter maintained that EPA based its volume determination for lightweight aggregate APC dust/sludge data from only six of the 28 facilities believed to generate the waste. The commenter argued that the Agency made no effort to determine if these few facilities were representative of the industry.

In response to this comment, EPA has carefully reviewed all data available from the industry survey and from other sources. The Agency's revised waste generation estimate (presented in Section III, below), is based upon data obtained from the majority of active lightweight aggregate production facilities. These data show that this is a high volume waste.

Process Wastewater From Primary Magnesium Production by the Anhydrous Method

a. Hazard. One commenter questioned EPA's decision not to propose for

removal from the Bevill exclusion process wastewater from primary magnesium processing by the anhydrous method even though EPA's sampling demonstrated that the waste exhibits the hazardous waste characteristic of corrosivity (pH level of 1.22). EPA should, they contended, further consider this data in preparing its Report to Congress.

The Agency generally agrees with the commenter that relevant hazard data should be considered in the study of the waste stream when preparing the Report to Congress. However, EPA finalized the low hazard criterion in the September 1, 1989 rule, and is not currently entertaining comments on it. The Agency's rationale for the low hazard criterion is outlined in 54 FR 36592. As discussed in the 9/25/89 proposal, the waste does not exhibit a pH below the Bevill hazard criterion value of 1.

11. Process Wastewater From Phosphoric Acid Production

Four commenters stated that EPA correctly proposed that process wastewater from phosphoric acid production be retained within the scope of the Bevill Amendment and that EPA should retain this waste within the Bevill exclusion in the final rule.

a. Processing Criterion/Waste Definition. One commenter argued that process water recirculated in the phosphate complex, including the gypsum stacking system, is not discarded. Process water's nutrient value, which is extracted for fertilizer products, and its utilization as a coolant and transport medium, are not activities that should cause it to be classified as a solid waste as defined by the Resource Conservation and Recovery Act.

EPA responds that the definition of solid waste is an issue that is not open for comment in connection with today's rulemaking. EPA wishes to point out, however, that the issue of when cooling water is a solid waste has been discussed in previous rulemakings. Specifically, in the preamble to the January 4, 1985 (50 FR 614) final rule that established the current definition of solid waste, the Agency indicated that cooling water managed entirely in a closed-loop system was not considered to be reclaimed and, thus, would be eligible for the closed-loop exclusion. The Agency also indicated, however, that secondary materials managed in impoundments would not be eligible for the closed-loop exclusion. In addition, the surface impoundments collecting cooling water off of gypsum stacks are waste treatment units, further indicating that the contents are solid wastes.

(i) Comments on phosphogypsum transport water. One commenter supported EPA's inclusion of the water used to transport phosphogypsum within the definition of process wastewater from phosphoric acid production.

(ii) Comments on stack runoff. Three commenters argued that "stack runoff" should be included in the definition of process wastewater from phosphoric acid production. One commenter maintained that stack runoff is comprised of "phosphogypsum transport" water, which is specifically included in the definition of process wastewater from phosphoric acid production. The commenter further stated that the definition of process wastewater from phosphoric acid production, which includes "several points in the wet process," is intended to include all process wastewater generated at all points within that process. A second commenter reasoned that, just as process wastewater managed in a pond that receives precipitation continues to be process wastewater, gypsum transport water that is temporarily trapped within a gypsum stack and receives precipitation continues to be gypsum transport water. The commenter also indicated that because runoff from dry stacks is not hazardous, and as runoff from wet stacks contains transport water which has been retained, stack runoff should also be retained within the Bevill Amendment.

One commenter noted that comments from previous rulemakings and other documents may have led to the incorrect impression that phosphogypsum stack runoff standing alone exhibits characteristics of hazardous waste. The commenter also indicated that they believe the Agency has resolved this issue satisfactorily, however, by including water used for phosphogypsum transport in the description of phosphoric acid process wastewater included in the proposed rule. The commenter further concluded that because only the phosphogypsum transport water entrained in precipitation runoff from phosphogypsum stacks ever exhibits characteristics of hazardous waste, EPA's proposal to include phosphogypsum transport water within the scope of the Bevill Amendment resolves the issue of the status of precipitation runoff.

(iii) Comments on uranium recovery wastewater. Commenters noted that the uranium recovery step of phosphoric acid production follows the reaction of phosphate rock and sulfuric acid and precedes the concentration and

purification steps required to produce commercial grade, also known as merchant grade, phosphoric acid. Two commenters argued that the process wastewater generated from the uranium recovery step of phosphoric acid production must be considered a component of "process wastewater from phosphoric acid production" and, thus, proposed it for retention within the Bevill Amendment.

(iv) Comments on process wastewater from animal feed production. Two commenters maintained that process wastewater from animal feed production should be included in the definition of process wastewater from phosphoric acid production and thus retained in the Bevill exclusion. One commenter claimed animal feed process wastewater, standing alone, meets the Agency's high volume and low hazard criteria. This commenter further argued that the production of animal feed constitutes mineral processing, citing the following reasons: (1) Three key animal feed ingredients (dicalcium phosphate, mono- and dicalcium phosphate, and defluorinated phosphate rock) are produced from beneficiation of either phosphate rock or limestone; (2) processing removes and/or enhances the characteristics of either beneficiated phosphate rock or limestone; (3) none of the materials used is a scrap material; (4) the processes produce final mineral products; and (5) no combination with non-mineral products is involved. Therefore, the commenter argued, process wastewater from such production should be retained within the scope of the Bevill Amendment.

The commenter also addressed several aspects of the production process. The commenter argued that the defluorination step in animal feed production should not prevent process wastewater from animal feed production from remaining within the Bevill exclusion. The production of defluorinated phosphoric acid involves essentially the same process as the production of undefluorinated commercial grade phosphoric acid. Defluorination is only an additional step in acid production in which fluorides are removed from the acid by heat and the addition of a silicon mineral to facilitate removal of fluorine. No meaningful distinction can or should be made regarding defluorinated phosphoric acid simply because defluorination occurs before or after concentration to commercial grade strength.

The commenter further argued that the production of monoammonium phosphate, an animal feed product, constitutes mineral processing, even

though the process makes use of ammonia, a non-mineral ingredient. The commenter indicated that ammonia is added to defluorinated commercial grade phosphoric acid in a granulation process, involving approximately 7,000 gallons per minute of phosphoric acid production process water for particulate scrubbing. The commenter maintained that this amount of water is "infinitesimal" compared to the mineral processing process wastewater generated on a daily basis, and thus this small granulation process should be considered co-management and monoammonium phosphate process wastewater should be included within the Bevill exclusion of phosphoric acid process wastewater.

The commenter maintained that, if EPA determined that returning to its source the 7,000 gallons per minute of phosphoric acid process wastewater used during feed grade monoammonium production would result in the removal of the entire phosphoric acid process wastewater system from the Bevill Amendment, the production of feed grade monoammonium phosphate would be ceased and the product removed from the market.

(v) Comments on superphosphate wastewater. One commenter contended that process wastewater from superphosphate production should be retained within the scope of the Bevill Amendment. The commenter argued that data submitted by industry in the mineral processing survey demonstrates that this waste from superphosphate production meets the high volume and low hazard criteria. In addition, the commenter claimed that superphosphate production meets the relevant aspects of the EPA mineral processing definition, stating that the production of superphosphate rock involves the direct reaction of phosphate rock with dilute, not merchant grade, phosphoric acid.

(vi) Comments on ammoniated fertilizer wastewater. Two commenters argued that process wastewater generated in the production of ammoniated phosphate fertilizers (APF) should be retained within the scope of the Bevill Amendment. The inclusion of phosphoric acid process wastewater within the scope of the Bevill Amendment should, they contended, resolve the issue of whether APF process wastewater is included. The influent water to the ammoniated phosphate fertilizer process is the process wastewater from phosphoric acid production, which remains under the Bevill exclusion. The commenter claimed that if APF process wastewater exhibits hazardous characteristics, it is

solely because process wastewater from phosphoric acid production is used in APF production. The commenter further argued that the entire APF production process should not be removed from the Bevill exclusion, when the cause of the hazardous characteristic is phosphoric acid wastewater, which is covered under the Bevill exclusion.

(vii) Comments on sulfuric acid wastewater. One commenter contended that captive sulfuric acid production involves mineral processing and is absolutely essential to the production of phosphoric acid by the wet process. The commenter urged EPA to either clarify that sulfuric acid wastewater produced as a result of sulfuric acid production is part of phosphoric acid process wastewater or revise its interpretation of the mixture rule so that such process wastewater can continue to be managed in the sound and cost-effective manner practiced today.

(viii) Response to Comments. In the proposal, EPA noted that process wastewaters are generated at several points in the wet process, included phosphogypsum transport, phosphoric acid concentration, and phosphoric acid temperature control and cooling. (See 54 FR 39303.) As stated previously, the Agency did not intend to imply that these were the only sources of process wastewater from phosphoric acid operations.

The Agency has carefully considered the comments and, based on the information available, agrees, for the reasons described in the comments, that phosphogypsum stack runoff, process wastewater generated from the uranium recovery step of phosphoric acid production, process wastewater from animal feed production (including defluorination but excluding ammoniated animal feed production), and process wastewater from superphosphate production are also the result of mineral processing operations and should be considered part of process wastewater from phosphoric acid production.

As discussed on September 1 (see 54 FR 36621), the Agency does not consider the production of ammoniated phosphate fertilizer from phosphoric acid and ammonia to be a mineral processing operation. For the same reasons, the Agency does not consider the production of ammoniated animal feed from phosphoric acid to be a mineral processing operation. As also discussed on September 1 (see 54 FR 36623), the Agency does not consider wastes from sulfuric acid production to be part phosphoric acid process wastewater.

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b. Volume. A commenter stated that the data collected by the Agency at its facility and similar facilities indicate that the process wastewater meets EPA's high volume criterion.

c. Hazard. Two commenters addressed the hazard level of this waste. One supported EPA's proposed determination that process wastewater from phosphoric acid production meets the low hazard criterion. However, one commenter questioned why the waste stream was not proposed for removal from the Bevill exclusion because EPA's sampling data showed that process wastewater from phosphoric acid production exhibits the hazardous waste characteristic of corrosivity (pH values 2.0, 2.1, 1.8, and 1.5). EPA should, they maintained, further consider this data in preparing its Report to Congress. The Agency generally agrees with the commenter that relevant hazard data could be considered in the study of the waste stream when preparing the Report to Congress. However, EPA finalized the low hazard criterion in the September 1, 1989 rule, and is not entertaining comments on it. The Agency's rationale for the low hazard criterion is outlined in 54 FR 36592. The waste passes the pH criterion described in that rule.

12. Chloride Process Waste Solids From Titanium Tetrachloride Production

One commenter agreed with EPA's proposal to retain chloride process waste solids from titanium tetrachloride production within the Bevill exclusion.

a. Processing Criterion/Waste Definition. One commenter claimed that EPA, in its description of the "chloride process waste solids from titanium tetrachloride production" in the proposal, described only the "chloride" process for manufacturing titanium dioxide and *not* the "chloride-ilmenite" process. The Agency stated that "the chloride process involves fluidized roasting and chlorination of rutile, synthetic rutile, slag or beneficiated ilmenites." This statement, according to the commenter, essentially describes the "chloride" process that uses "high-grade" ores or beneficiated ores as feedstocks; the chloride-ilmenite process, in contrast, uses "low-grade" ores as the principal feedstock for its process.

In addition, the commenter contended, the Agency incorrectly stated that the product formed is "titanium tetrachloride." This may be true of the "chloride" process that uses "high-grade" ores or previously beneficiated material, but is only partially true of the chloride-ilmenite process. In the chloride-ilmenite process, the commenter continued, gaseous iron

chlorides are generated first and are subsequently condensed into iron chloride "waste acids". This is the "beneficiation" process. After this, the titanium in the ores is converted at a much slower rate into titanium tetrachloride. Both of these processes, however, occur in a continuous, "one-step" operation. The titanium tetrachloride generated by the chloride-ilmenite process is then used as the feedstock for the ultimate production of titanium dioxide. The commenter expressed concern that EPA appears to incorrectly consider the "chloride-ilmenite" process to be covered within the "chloride process," for which the "mining waste exclusion" was eliminated for "chloride processing waste acids" in the September 1, 1989 final rule. The commenter objected to this conclusion because the chloride-ilmenite process should not be "lumped" with a process that is clearly and substantially different, noting that the distinction between the two processes has been recognized since at least 1970. The commenter claimed that its titanium dioxide plants could be materially and adversely affected by EPA's determinations regarding whether or not "chloride-ilmenite" plants are considered "beneficiation" versus "processing" facilities. The commenter also claimed its "chloride-ilmenite" process is not covered by either of the Agency's rulemakings (Sept. 1 and Sept. 25, 1989), and thus would be covered by an upcoming "special study" for beneficiation wastes. The commenter urged EPA to make a determination that the "chloride-ilmenite" process is one of beneficiation of low grade ilmenite ore and "chlorination" and should be made subject to the upcoming RCRA 8002(p) special studies to determine the appropriate waste management requirements.

In response to these comments, EPA reviewed the court opinions and related EPA effluent limitation guidelines cited by the commenter for precedents for considering the chloride-ilmenite process to be significantly different from the conventional chloride process. The Agency also referred to written comments submitted by the same commenter in response to previous proposed rulemakings addressing the scope of the Mining Waste Exclusion. Based upon this review, EPA agrees with the commenter that the chloride-ilmenite process is different than the conventional chloride process in that ilmenite ore used as the feed stock to the process contains much larger quantities of iron, which must be removed, than the feed stocks used by other chloride processes. In addition,

EPA agrees that, in part, the chloride-ilmenite process involves beneficiation of ores or minerals. Nevertheless, the Agency continues to believe that it is reasonable to consider the chloride-ilmenite process to be a part of the general "chloride process" category for purposes of this rulemaking because the process destroys the identity of the mineral, produces titanium tetrachloride gas (a saleable mineral product), and generates wastes which are functionally identical to, although larger in volume than, the wastes generated by other chloride process facilities. Moreover, because the "beneficiation" wastes and the "processing" wastes generated by the chloride-ilmenite process are inseparable, according to EPA effluent guidelines development documents and as argued by the commenter, the Agency concludes that the "chloride-ilmenite" process must be considered a mineral processing operation for purposes of this rulemaking.

The Agency also notes that the commenter's contention that the "chloride-ilmenite" process is not covered by the description of the chloride process provided in the September 1, 1989 final or the September 25, 1989 proposal is incorrect. While the description of the chloride process provided in these rules does not describe the "chloride-ilmenite" process in detail due to Confidential Business Information claims made by the commenter, the Agency has clearly considered this process to be one of the several chloride processes covered by these previous rulemakings and, therefore, this rulemaking as well. This fact is clearly demonstrated by the inclusion of the commenter's facilities in the background documentation for these rulemakings. Accordingly, all solid wastes generated by this process are subject to EPA's reinterpretation of the Mining Waste Exclusion, including this rulemaking.

b. Volume. One commenter agreed with EPA's determination that chloride process waste solids satisfy the high-volume criterion. Another commenter submitted volume data, claiming that the waste streams from the "chloride-ilmenite" process are generated at over 1,400,000 and 600,000 tons annually in two facilities.

c. Hazard. One commenter agreed with EPA's determination that chloride process waste solids satisfy the low-hazard criterion.

13. Slag From Primary Zinc Processing

One commenter asserted that EPA properly applied the high volume/low

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hazard criteria to slag from primary zinc processing in the September 25 proposal.

a. Hazard. One commenter questioned EPA's decision not to propose to remove slag from primary zinc processing from the Bevill exclusion because the sampling data demonstrated that the waste exhibits the hazardous waste characteristic of EP-toxicity for lead. They stated that EPA should further consider these data in preparing its Report to Congress.

The Agency generally agrees with the commenter that all relevant hazard data should be considered in the study of the waste stream when preparing the Report to Congress. However, EPA finalized the low hazard criterion in the September 1, 1989 rule, and is not currently entertaining comments on it. The Agency's rationale for the low hazard criterion is outlined in 54 FR 36592. As discussed in the September 25, 1989, proposal, the waste passes the toxicity criterion described in that rule.

C. Comments on the Seven Wastes Proposed for Removal

This section discusses comments received on each of the seven mineral processing wastes for which EPA proposed to remove from the Bevill exemption. The comments received on each of the wastes generally are presented under one of three subheadings: Processing Criterion/Waste Definition, Volume, or Hazard. These subheadings appear only when they are relevant to comments identified for the waste being discussed, so for many of the seven wastes, one or more of the subheadings are not included.

1. Roast/Leach Ore Residue From Primary Chromite Processing

a. Processing Criterion/Waste Definition. Two commenters remarked on the designation of the waste stream. One commenter contended that the original designation of roast/leach ore residue from primary processing of chrome ore referred to the ore residue solids in the form currently being disposed (after treatment), not the form in which the waste is generated. The commenter stated that it is the waste as disposed that has the potential to enter the environment, and that this waste is low hazard and high volume and should be retained. Another commenter argued that because the ore used in production of chromium chemicals contains not only chrome but also other compounds (e.g., magnesium silicate), the term "chrome ore" or "chromium ore" would be more appropriate for use by the Agency.

EPA agrees with both of these comments. In today's final rule, the

Agency bases its evaluation of this waste's compliance with the Bevill criteria on *treated* residue from roasting/leaching of chrome ore.

b. Hazard. Three commenters addressed the apparent failure of this waste stream to meet the low hazard criterion. One commenter agreed with EPA's proposed determination, and provided data that indicated that treated waste from chromite ore processing is occasionally EP toxic, based on data it received from American Chrome and Chemical.

One commenter acknowledged that residue from the roasting/leaching of chrome ore is hazardous at the point of generation. The commenter asserts, however, that through treatment at the wastewater treatment plant in compliance with the facility's NPDES permit, the waste stream ceases to exhibit the hazardous waste characteristic for chromium; both the liquid and non-liquid fractions of the stream are rendered non-hazardous. The commenter states that this treatment practice has been demonstrated to, and accepted by, the State of North Carolina.

Another commenter maintained that, in making its hazard determination for this waste, EPA relied on samples taken from an inappropriate stage of the waste management process. The commenter claimed that the materials from the post-treatment stage, and in particular the solids, are non-hazardous and qualify for the exclusion. In addition, they contended, this treatment does not affect the volume of the waste.

The Agency has reviewed the available data and agrees with the commenters that these data indicate that the *treated* residue from roasting/leaching of chrome ore is low hazard. The Agency notes, however, that waste management activities associated with the untreated wastes, including the treatment operation itself, are not exempted from Subtitle C requirements by the Bevill amendment because prior to treatment the waste is not low hazard (although any tanks involved in the treatment process may qualify for the wastewater treatment until exemption under 40 CFR 264.1(g)(6)).

2. Process Wastewater From Coal Gasification

a. Processing Criterion/Waste Definition. One commenter described the production process for coal gasification. The production of coal gas (and thus process wastewater) involves, first, the controlled combustion of lignite. This produces a raw gas stream sent first to the Raw Gas Cooling and Shift Conversion units and then to the

Rectisol unit. The Rectisol unit removes acid gases CO₂, H₂S, CS₂, and COS) and produces synthetic fuel gases. These gases undergo methanation and gas compression and then are delivered to a pipeline as synthetic natural gas. A coproduct, naphtha, is also produced. "Gas liquor" is also produced by the cooling and refining of the raw gas stream.

The commenter added that the Gasification, the Raw Gas Cooling Shift Conversion, and the Rectisol units all produce gas liquor streams which are routed to the Gas Liquor Separation unit. During the gas liquor separating process, another coproduct, tar oil, is recovered. Afterwards, the gas liquor is sent to the Phenosolvan unit where crude phenol is recovered. Ammonia is then recovered in the Phosam unit, which discharges a "stripped gas liquor." The stripped gas liquor is sent to the Cooling Tower for use as a make-up water. Other liquids used as make-up water include: small quantities of filtered Dissolved Air Flotation water from the oily water sewer system, softened water from the potable water treatment plant, a small stream from the Rectisol unit, and small volumes of distillate water from the Multiple Effect Evaporators. The commenter also notes that: (1) Stripped gas liquor comprises over 70 percent of the make-up water in the Cooling Tower; (2) the Cooling Tower is operated with a blowdown rate of approximately 350 to 500 gallons per minute or 650,000 to 995,056 metric tons per year; and (3) the Cooling Tower blowdown is directed to the Multiple Effect Evaporators.

The commenter argued that because the stripped gas liquor is continuously used, and is not discharged by the facility, it cannot logically be regarded as a "waste." The commenter added, however, that if EPA does consider stripped gas liquor to be a waste, then it is the "process wastewater" generated by the facility.

EPA has reviewed the information provided in these comments and the National Survey response provided by the commenter and concluded that the available information indicates that stripped gas liquor is a solid waste that does not appear to be eligible for the closed-loop exemption because it sometimes is stored in an impounded prior to use. (See above discussion regarding phosphoric acid process wastewater and January 4, 1985 notice (50 FR 614.) However, EPA also concludes that stripped gas liquor is the principal aqueous waste generated by the gasification process and thus is

process wastewater and remains a Bevell waste.

b. Volume. Two commenters urged EPA to reconsider its proposed determination that process wastewater from coal gasification fails the high volume criterion. They contended that the data cited by EPA in the September 25, 1989 Federal Register were not accurate. Both commenters stated that process wastewaters are actually generated at a rate that far exceeds one million metric tons per year. One commenter claimed that rather than being generated at a rate of 598,030 metric tons per year, this waste is produced at a rate of approximately 5,000,000 metric tons per year. The commenter believed that this error was based on the Agency's misunderstanding of the gasification process and on its own response to the mineral processing waste questionnaire. The commenter identified the process wastewater as "cooling water" because, as discussed above, they do not consider it a waste. The commenter submitted the following volume data:

1986—4,910,000 metric tons;
1987—5,020,000 metric tons;
1988—4,830,000 metric tons; and
1989—5,050,000 metric tons.

The volume reported for 1989 is through October and projected through the end of the year.

EPA has carefully reviewed the comments and survey information and agrees that: (1) The facility characterized the point of generation when it initially completed the 1989 National Survey, which EPA used in developing the proposal; and (2) process wastewater from coal gasification meets the high volume criterion because it is early generated in quantities above the applicable criterion value of 1,000,000 t/yr average per facility established by the September 1 final rule.

c. Hazard. A commenter supported EPA's proposed determination that coal gasification process wastewater meets the low hazard criterion.

Furnace Off-Gas Solids From Elemental Phosphorus Production

One commenter supported EPA's decision to remove furnace off-gas solids from elemental phosphorus production from the Bevell exclusion.

a. Processing Criterion/Waste Definition. One commenter raised several issues about the definition of this waste stream. The commenter supported EPA's proposed determination that furnace off-gas solids are "solids," even though one facility generates the waste in the form of a slurry. The commenter notes that

furnace off-gas solids from elemental phosphorus production are generated either as a solid waste stream or as a slurry and contends that the term "elemental phosphorus off-gas solids" was specifically defined to include, among other things, "precipitator slurry." EPA's assertion that the commenter aggregated off-gas solids with scrubber blowdown is, the commenter claimed, incorrect. The commenter also claimed that further examination shows that the material stream is more properly classified as "phosphy water" and that one result of reclassification is that 1.5 million tons of furnace off-gas solids should be reclassified as "phosphy water." The commenter maintained that the regulatory status of "phosphy water" for the September 1, 1989 Final Rule was based upon data that understated the generation rate of this process stream by approximately one-half. The commenter further maintained that all furnace off-gas solids waste streams need to be similarly classified to prevent this rulemaking from having inequitable competitive effects between companies.

EPA agrees that the waste stream in question should be defined uniformly across all facilities that generate it. Because the waste stream is generated (and managed) as a solid at the majority of facilities where it is generated, EPA's position is that the waste of interest is a solid. As a result, at the two facilities at which the off-gas solids are collected in a liquid, the high volume and low hazard criteria have been applied to the solids entrained within these liquid wastes, as determined by the settled solids reported by the facilities in their responses to the National Survey. The liquid portions of the wastes, as generated, clearly fail the applicable high volume criterion (average annual generation rate of more than one million metric tons per year).

b. Volume. A commenter stated that the waste stream encompassing furnace off-gas solids from elemental phosphorus production is generated as a liquid at one facility. The commenter concurred that the stream does not meet the high volume criterion. Another commenter argued that because of the relatively low volume of the furnace off-gas solids (4,885 mt/yr), the treatment of these solids as hazardous wastes is reasonable and practicable.

However, one commenter argued that the volume determination must be made using data from all facilities that generate furnace off-gas solids. EPA's proposed determination that the average rate of generation per facility is 4,885 metric tons per year was, they contended, based on incomplete

information because data from facilities that submitted data as Confidential Business Information were not included. The commenter further contended that when all five facilities' furnace off-gas solids material streams are considered, the per plant facility average for the "furnace off-gas solids" is 44,012 metric tons per year, and that this average is well within any statistical margin for error and thus, furnace off-gas solids should be deemed a "high volume" waste.

As stated above, "furnace off-gas solids" generated at two facilities that reported using wet collection systems are defined as the solids removed from the scrubber waters. Furnace off-gas solids generated by three other facilities are in fact solids as generated. Revised (and final) waste generation determinations have been prepared on this basis and are presented in Section III, below. These data show that furnace off-gas solids is not a high volume waste.

c. Hazard. Two commenters addressed the hazard level of furnace off-gas solids from elemental phosphorus production. One commenter stated that the analytical information it provided in the 1989 National Survey demonstrated that the waste stream is not a hazardous waste under the RCRA characteristic of corrosivity. The other commenter contended that samples of the slurry of furnace off-gas solids were found to contain cadmium in concentrations as great as 249 percent of the regulatory level of 100 times the MCL.

Review of EPA's sampling data indicated that this waste passes the low hazard criterion, as discussed in Section III below.

4. Process Wastewater From Hydrofluoric Acid Production

a. Processing Criterion/Waste Definition. Two commenters described the hydrofluoric acid production process. The hydrofluoric acid production process extracts mineral values by reaction of mineral rock with sulfuric acid, creates a calcium sulfate co-product, fluorogypsum, which is slurried to disposal, and circulates process wastewater through a pond system prior to reuse in the processing facility. One commenter noted that additional process wastewater is generated by cleaning the hydrofluoric acid gas.

One commenter argued that EPA's determination to list separately fluorogypsum and process wastewater from hydrofluoric acid production is impractical. The similarities between

the two waste streams are such that at the Calvert City, Kentucky hydrofluoric acid plant, the two are co-mingled at the point of generation. The commenter claimed that the proposed regulation would impose different regulatory requirements on two similar wastes (because fluorogypsum would remain excluded, but process wastewater would not), which from a practical perspective, is unreasonable since the requirements applicable to one will affect the management of the other. EPA should allow process wastewater from hydrofluoric acid production to retain its status under the Bevill exclusion, and should not evaluate fluorogypsum and process wastewater separately, because the two streams are essentially identical.

EPA disagrees. The two waste streams are identifiably distinct (one is solid and the other a liquid) and are generated by different parts of the production process. The fact that they are currently co-managed does not imply that they should or must be co-managed.

b. Volume. Two commenters disagreed with EPA's proposed determination that process wastewater from hydrofluoric acid production failed to meet the high volume criterion. One commenter questioned the basis for EPA's decision, given the lack of data. The commenter argued that the waste was not included in the 1989 National Survey of Solid Wastes from Mineral Processing Facilities. Therefore, in the September 25, 1989 NPRM, the average rate of generation of process wastewater from hydrofluoric acid was stated as "n/a". Yet EPA determined that this liquid waste stream was not generated in quantities over 1,000,000 metric tons per year through calculations or interpretations of survey results, which were not provided in the background documents. The second commenter argued that EPA may have overlooked or misunderstood the Survey data. In fact, they stated, process wastewater from hydrofluoric acid production is generated at an average rate per facility far in excess of 1 million metric tons per year. The commenter resubmitted its Survey, which includes a process flow diagram of the hydrofluoric acid process. Information is also provided on the volume of process wastewater generated and managed in sections 5 and 6 of the Survey.

One commenter supported EPA's application of the high volume criterion to the reported process wastewater flows to surface impoundments. The commenter maintained that the flow rate to surface impoundments can be

used to estimate process wastewater flow rates. According to the commenter, data available through plant NPDES records, the commenter claimed, indicate that the flow rate does exceed the 1,000,000 metric tons per year Bevill criterion. Specifically, the most recent water balance, submitted as part of the NPDES renewal application, indicated that the inflow to surface impoundments from the hydrofluoric acid production process was 2,079,400 gallons per day, which is equivalent to 2,900,000 metric tons per year, according to the commenter.

The Agency has carefully reviewed these comments and the revised survey submitted by the commenter and agrees that process wastewater from hydrofluoric acid production satisfies the high volume criterion, as discussed below in section III.

c. Hazard. Two commenters addressed the hazard level of process wastewater from hydrofluoric acid production. One commenter agreed with EPA's proposed determination that the waste is low hazard. Another commenter claimed, however, that EPA's sampling data demonstrated that process wastewater from hydrofluoric acid production exhibits the hazardous waste characteristic of corrosivity (pH values of 1.4 and 1.86), and questioned EPA's failure to remove the waste from the Bevill exclusion. The commenter also urged EPA to consider this data in preparing its Report to Congress.

The Agency generally agrees with the commenter that all relevant hazard data should be considered in the study of the waste stream when preparing the Report to Congress. However, EPA finalized the low hazard criterion in the September 1, 1989 rule and is not currently entertaining comments on it. The Agency's rationale for the low hazard criterion is outlined in 54 FR 36592. EPA's sampling data indicate that this waste does not exhibit a pH of less than 1, and therefore, complies with the low hazard criterion.

5. Process Wastewater From Primary Lead Processing

a. Processing Criterion/Waste Definition. One commenter claimed that EPA must study all process wastewaters from primary lead production, contending that once EPA completes its study, it will realize that these are not wastes, because process wastewaters from primary lead production are reused within the primary lead production circuit. RCRA hazardous waste requirements, therefore, are not appropriate.

In response to this comment, EPA notes that the extent to which this waste

stream is managed through "closed loop" recycling, and hence, is not subject to RCRA requirements, would be addressed in the Report to Congress, if this material were found to meet the Bevill special waste criteria. The waste does not meet these criteria, however, and thus will not be included in the Report to Congress. Nevertheless, if the waste is managed in such a way that it does not meet the definition of a solid waste, then RCRA hazardous waste requirements would not apply.

One commenter urged EPA to clarify its definition of process wastewater from primary lead production so that all waters that are collected from processing operations are specifically included in that definition. The commenter states that the only reason for EPA's including contact cooling water in the definition of process wastewater and not including acid plant blowdown is the arbitrary elimination of one relatively large volume process water stream from the volume amount. In addition, defining this waste as "waters that are uniquely associated with processing operations that have accumulated contaminants to the point that they must be removed from the mineral production system" is confusing. Do the waters need to be removed from the system, or do the contaminants need to be removed from the waters?

EPA responds that the reasons for distinguishing between different aqueous waste streams generated in the mineral processing industry have been discussed at length in previous rulemaking notices (54 FR 15316, April 17, 1989; and 54 FR 36592, September 1, 1989.) Briefly, EPA believes the distinctions it has made are appropriate based on the available information concerning the waste characteristics and points of generation in the process. As explained in the preamble to the September 1, 1989 final rule, EPA has considered acid plant blowdown and other wastewaters from primary lead processing to be two distinct wastes because these wastes have substantially different characteristics. EPA believes that the definition of wastewater clearly indicates that it is the wastewater that needs to be removed from the system because it is the wastewater and not the contaminants to which the definition refers.

b. Volume. One commenter stated that the volume EPA used as a basis for proposing to eliminate process wastewater from primary lead production was less than the actual amount generated at its plants. The commenter argued that this incorrect determination was a result of artificial

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limitations on the actual amount of water that could be reported as "process wastewater" in the National Survey of Solid Wastes from Mineral Processing Facilities, where EPA only solicited information on processing units associated with the generation of process waters. According to the commenter, EPA inappropriately reduced the number of streams counted toward the volume cutoff by focusing on only a few process water streams. The commenter maintained that its internal data indicate that the volumes of process wastewater from primary lead production generated by its plants exceed the 1,000,000 metric ton threshold. Another commenter was dismayed by EPA's conclusion that process wastewater from primary lead processing was low volume, because there is no way to verify the numerical data used to arrive at the average of 785,562 metric tons per year.

EPA responds that the National Survey requested data on the quantity of wastewater generated by all mineral processing operations at each facility surveyed, and that the responses provided indicate that process wastewater is not a large volume waste. EPA is limited in the amount of information it can present on the waste generation calculations used to develop the September 25 proposal because one of the commenters has requested Confidential Business Information status for their information.

c. Hazard. One commenter objected to EPA's on-site sampling methods. If, in the survey, the Agency requests information on process wastewaters, other waste streams, such as process water from sintering, should not be sampled for the hazard determination.

Because of the scheduling constraints imposed by the Court of Appeals, EPA's waste sampling effort had to be conducted before the final contours of the beneficiation/processing boundary had been established. Thus, EPA sampled wastes that are, in hindsight, outside the scope of the current rulemaking. The analytical results for wastes that are outside the scope of this rulemaking (i.e., process water from sintering) have not been used in evaluating compliance with the low hazard criterion. Instead, EPA has used results from samples of wastes that are the subject of this rulemaking (i.e., slag granulation water) in determining that this is not a low hazard waste.

6. Sulfate Process Waste Acids From Titanium Dioxide Production

a. Hazard. One commenter stated that sulfate process waste acids from its facility meet EPA's low hazard criterion

and should therefore be retained in the Beville exclusion. The commenter disputed the selenium concentrations published in the proposed rule, stating that if EPA asserts that the sample exceeding the criterion comes from the commenter's facility, then the Agency is mistaken. The commenter notes that the sulfate process waste acid sample was essentially analyzed three times: once as is, once using the SPLP, and once for EP toxicity. In the leaching procedures (SPLP and EP Toxicity) the sample is filtered and the filtrate analyzed. The solids (if any) are leached and the leachate is analyzed. Since there were no solids, the three analyses should have agreed. In actuality, the concentration for selenium was below the detectable limit for two of the samples, while selenium showed up on the SPLP sample at a level of 6.3 mg/l. The commenter retained a portion of the sample that was collected for EPA and had it analyzed for EP Toxicity. Selenium concentrations were below detectable limits. The commenter also claimed to have made facility improvements which have caused sulfate process waste acids to become less acidic. The overall average pH from 1984 through 1988 was 1.02.

EPA agrees that the reported SPLP selenium concentration that is questioned by the commenter does appear to be anomalous, but believes that the other data, including the pH data, collected during EPA's sampling visits are accurate and provide a sufficient basis for applying the low hazard criterion to this waste stream. The average pH data provided by the commenter are not relevant to this rulemaking because average pH values do not have meaning and are not consistent with the data requirements specified in the low hazard criterion for the pH test.

7. Sulfate Process Waste Solids From Titanium Dioxide Production

a. Volume. Two commenters urged EPA to reconsider its preliminary conclusion that sulfate process waste solids fail to meet the high volume criterion. One commenter indicated that sulfate process waste solids are generated, in the form of a slurry, at a rate of 86,800 short tons (78,728 metric tons) per year as indicated in the November 21, 1988 comments and the response to EPA's National Survey of Solid Wastes from Mineral Processing. Another industry commenter claimed that EPA miscalculated the volume of sulfate process waste solids generated annually. The commenter stated that a total of 49,900 metric tons are handled. The values used for suspended solids

were from the commenter's quarterly samples, which have been taken since 1984. According to the commenter, these volumes confirm those given, in comments provided in response to the October 10, 1988 proposal of 85,000 tons/year, which included chloride wastes. The commenter further indicated that these wastes, together with the treatment residuals, will bring the total solids handled to well over 500,000 tons per year.

It is EPA's position that the waste of interest is the dewatered waste solids taken from the drum filter at one facility, rather than the slurry from the clarifier, as suggested by the commenter, because the available information indicates that the primary purpose of the dewatering operation performed by the drum filter is to return product solution to the production process and, thus, it resembles a processing operation more closely than it does a waste treatment operation. Accordingly, EPA has used the reported quantity of drum filter cake rather than the quantity of slurry sent to the drum filter in evaluating the compliance of this waste stream with the high volume criteria. After further analysis, the Agency has concluded that the revised waste generation rates reported by the second commenter are reasonable, though the underlying data are not readily apparent in the commenter's response to the National Survey. Revised (and final) waste generation estimates, which indicate that this is not a high volume waste, are presented in section III, below.

D. Relationship of the Proposed Rule to Subtitle C of RCRA

1. The Mixture Rule

a. General comments. In their comments on the September 25 proposal, a number of commenters objected to the Agency's interpretation of the mixture rule in the September 1, 1989 final rule and questioned what the impact of the mixture rule would be upon the Beville determinations contained in the September 25 proposal. Commenters requested that EPA reconsider its interpretation of the mixture rule as it applies to Beville excluded wastes that are mixed with relatively small volumes of non-excluded wastes. Commenters noted that a mixture of a Beville excluded waste and a characteristically hazardous waste would be considered a non-excluded hazardous waste. Particularly in the phosphate industry, commenters objected to this classification, arguing that if the non-excluded waste in a mixture shares the

same hazardous characteristic as the Bevill excluded waste, the Bevill status of the resulting mixture should not be withdrawn.

Commenters also requested that the Agency clarify the mixture rule in a number of ways. First, they suggested that EPA clarify whether mineral processing wastes that are temporarily excluded from RCRA Subtitle C requirements may be used (e.g., as air pollution control scrubber water) in production units that do not generate Bevill wastes, and similarly whether non-Bevill excluded wastes may be used in production units that generate Bevill excluded wastes. In particular, commenters requested clarification of the status of a Bevill-excluded waste that is used in a non-Bevill production unit when the waste exhibits a characteristic or hazardous waste after use in the non-Bevill operation only because the Bevill waste that is an input to the non-Bevill process exhibits the hazardous characteristic.

In addition, commenters argued that the October 26, 1989 supplement to the proposed regulations for burning of hazardous waste in boilers and industrial furnaces (54 FR 43718) conflicts with the interpretation of the mixture rule established in the September 1, 1989 final rule. The proposed rule on burning states that residues would remain within the Bevill exclusion if the character of the residual is determined by the Bevill material. In contrast, the September 1 final rule states that any material burned with a low volume, non-Bevill waste would be regarded as hazardous even if the characteristic exhibited is the same as the characteristic of the Bevill waste. Commenters requested that the Agency reconcile these conflicting interpretations of the mixture rule by adopting the approach in the proposed rule on burning.

b. Comments related to phosphoric acid production. Commenters from the phosphoric acid industry requested that the Agency provide a supplementary explanation of its mixture rule position as it relates to phosphoric acid process wastewaters, and allow for public comment. The ammoniated phosphate fertilizer (APF) process utilizes process wastewater as an influent and then returns it to the originating phosphate complex pond. One commenter contended that APF process wastewater does not exhibit hazardous characteristics when generated separately from a facility that produces phosphoric acid. Therefore, the commenter argued, APF wastewater must not contribute the hazardous

characteristic found in phosphoric acid process wastewater, and thus it should not trigger the removal of phosphoric acid process wastewater from the Bevill exclusion. Phosphate industry commenters urged the Agency to reject any interpretation of the mixture rule that would remove phosphate complex pond water from the Bevill exemption because it contained process wastewater used in the APF process.

Commenters urged the Agency to adopt an interpretation of the mixture rule consistent with the position advocated in the October 26, 1989 proposal (54 FR 43718) on burning, and allow small amounts of sulfuric acid process wastewater to be combined in the general process wastewater system without the removal of the entire system from the Bevill exclusion. Phosphate industry commenters objected to the mixture rule interpretation contained in the September 1, 1989 final rule in which the addition of sulfuric acid process wastewater to a phosphoric acid complex's water recirculation system would result in the entire system being removed from the Bevill exclusion. According to one commenter, although sulfuric acid process wastewater displays the same characteristic of corrosivity as phosphoric acid process wastewater, the addition of sulfuric acid process wastewater may constitute less than one percent of the daily wastewater generated at an average facility, and thus should not affect the Bevill status of the entire waste stream.

c. Comments related to hydrofluoric acid production. One commenter requested clarification on the use of hydrofluoric acid process wastewater in an aluminum fluoride plant, and asked the Agency to address the use of Bevill excluded characteristic wastes as a source of influent to other processes. The commenter argued that hazardous characteristics displayed by water existing in the aluminum fluoride facility are solely from hydrofluoric acid (HF) process wastewater. Thus, the commenter asserted, the Agency's interpretation of the mixture rule should have no bearing on whether HF process wastewater remains within the Bevill exclusion. The commenter requested that if the Agency interprets the mixture rule such that the use of process wastewater in the aluminum fluoride plant results in all water in the pond where that water is finally disposed being removed from the Bevill exclusion, EPA should supplement the proposed rule with its rationale for such a decision, and allow for additional public comment.

d. Comments related to coal gasification. One commenter objected to the Agency's possible determination, based upon the mixture rule, that process wastewater from coal gasification is hazardous. The commenter asserted that if process wastewater was disposed of immediately rather than used in a cooling tower, the waste stream would not demonstrate hazardous characteristics; however, important water conservation and disposal practices could not then be practiced. Thus, the commenter concluded, the Agency should not withdraw the Bevill exclusion for coal gasification process wastewaters based upon hazardous characteristics when those characteristics result from appropriate water conservation and disposal practices.

e. Response to comments. In response to these questions and issues raised by commenters regarding the mixture rule, EPA makes the following observations. First, like the criteria established for identifying wastes eligible for the Bevill exemption, the Agency's position on the mixture rule was finalized on September 1, 1989 and is not open for comment as part of this rulemaking. Second, the Agency plans to add comments to the docket for the October 26th notice regarding the alleged contradiction between the October 26, 1989 (54 FR 43718) supplement to the proposed regulations for burning of hazardous waste in boilers and industrial furnaces and the mixture rule in the September 1, 1989 final rule. Third, wastes from operations that are not mineral processing operations based on the definition of mineral processing contained in the September 1 final rule are not mineral processing wastes regardless of the nature of any inputs (including Bevill wastes) to that process. Finally, the mixture rule is not a factor in today's decision to retain the Bevill exemption for process wastewater because Bevill wastes are being evaluated, not mixtures.

2. Land Disposal Restrictions

Two commenters expressed concern about the impact of Land Disposal Restrictions (LDRs) on wastes newly removed from the Bevill exclusion. One commenter stated that the Agency cannot accurately estimate the economic impact of the proposed rule until the "Third Third" rule is promulgated.

The second commenter requested that the Agency consider mineral processing wastes removed from the Bevill exclusion, "newly identified" wastes

US EPA ARCHIVE DOCUMENT

under the LDRs. Since "chloride-ilmenite" wastes from titanium production were not considered RCRA hazardous wastes on November 9, 1984, the date of HSWA enactment, the commenter asserted that they must be considered newly identified wastes. The commenter argued that without terming these wastes newly identified, the facility would unfairly have to meet the hammer date of August 8, 1990 for California List wastes. Facilities that generated a waste subject to California List restrictions on underground injection were granted a two year national capacity variance during which they could either plan new capacity or submit a "no-migration" petition. The commenter maintained that equal opportunity must be granted to mineral processing facilities to develop new capacity or submit no-migration petitions.

In addition, the commenter asked that the Agency delay the applicability of the LDRs to chloride-ilmenite wastes by determining that such wastes are beneficial wastes and subject to further study by EPA. This would allow the Agency, according to the commenter, additional time to evaluate the protectiveness of underground injection of chloride-ilmenite wastes.

EPA responds that, as explained in the September 1, 1989 final rule and in the proposed land disposal restrictions (LDRs) for the third third schedule wastes (54 FR 48372, 48378; November 2, 1989), the Agency believes the wastes that are brought under Subtitle C regulation by today's final rule to be newly identified" wastes for purposes of establishing LDR standards under section 3004(g)(4) of RCRA. (54 FR 48372, 48378). Accordingly, EPA has proposed that newly identified mineral processing wastes not be subject to the BDAT standards that the Agency proposed on November 22, 1989 (54 FR 48372) for characteristic hazardous wastes. As required by RCRA section 3004(g)(4)(C), EPA plans to study the mineral processing wastes removed from the temporary exemption to determine BDAT for ones that exhibit one or more characteristics of a hazardous waste. (See 54 FR 48493.) The Agency has taken comment on this issue in connection with the LDR proposal and will address the issue, including the costs, if any, of requirements when it promulgates that rule. Finally, the reader should refer to the discussion on individual waste streams and process definitions for clarification of the status of chloride-ilmenite wastes.

3. Retroactive Application of Subtitle C Requirements

One commenter expressed concern over the retroactive application of Subtitle C to chromium-contaminated fill, and criticized the Agency for not specifically considering chromium-contaminated fill in redefining the scope of the Bevill exclusion, the economic impact screening, or the sampling effort. The commenter asserted that EPA should make a separate Bevill determination regarding the status of chromium-contaminated fill. The commenter wished to confirm that chromium-contaminated fill already in a lined containment facility would not be affected by the loss of Bevill exempt status. In addition, the commenter stated that if fill excavated after the effective date of the rule was subject to RCRA Subtitle C regulation, it could impose a severe economic burden upon the commenter.

The commenter argued that samples gathered by the Agency in the summer of 1989 from operating plants are not representative of the chromium contaminated fill in question at the commenter's facility. The commenter maintained that the conditions at the facility demonstrate that the waste stream satisfies the low hazard criterion. Due to its mixture with soils and other non-hazardous materials, long *in-situ* residence time, and weathering, the chromium fill material may be of a different physical and chemical nature than the wastes from chrome ore processing generated at operating plants, according to the commenter. Although soil samples from the initial excavation of this waste stream exceed the EP toxicity levels for chromium, more recent samples and ground-water samples have not been EP toxic. The commenter concluded that retaining chromium contaminated fill within the Bevill exclusion would allow for hazard testing of the material and adequate time to develop treatment options.

Based on the available information, EPA believes that chromium-contaminated fill is not a separate, discrete mineral processing waste because it may be, and likely is, as noted by the commenter, comprised of a mixture of mineral processing waste, non-mineral processing waste, and non-waste (e.g., soil) materials. In addition, EPA observes that the untreated residue from roasting/leaching of chrome ore is not low hazard and, thus, is not eligible for the Bevill exemption. As a result, the comments on the status of chromium-contaminated fill are only germane if the fill contains treated residue from roasting/leaching of chrome ore similar

to that which is currently being generated, which will need to be determined on a case-by-case basis. Because the composition of the fill and, therefore, the relevance of any data on the chemical composition of the fill is unclear, the Agency believes inclusion of such data in reaching a conclusion on the status of treated residue from roasting/leaching of chrome ore would be both inappropriate and impractical.

E. Costs and Impacts of the Proposed Rule

1. Technical Feasibility

Two commenters claimed that it would be technologically infeasible to manage their wastes according to subtitle C requirements. One commenter argued that it would be technologically infeasible to manage fluorogypsum or process wastewater from hydrofluoric acid production according to the minimum technology requirements or the LDRs. Another commenter maintained that insufficient land is available to retrofit existing waste management systems in order to manage phosphate rock processing wastes under subtitle C and the LDRs.

Because both of these wastes are retained within the Bevill exclusion by either the September 1 final rule, or today's rule, they will be studied in the Report to Congress which will address, among other issues, the technical feasibility of managing Bevill wastes under subtitle C of RCRA.

2. Compliance Cost Estimates

A commenter disapproved of EPA's analysis of economic impacts, contending that the Agency should include the costs due to corrective action requirements and land disposal restrictions (LDRs), because by ignoring these costs, EPA has underestimated the total costs of compliance. The difficulty of estimating these costs is, the commenter claimed, no justification for assuming zero costs for these requirements. Two of the wastes proposed for withdrawal from the Bevill exclusion are high-volume, and for those materials, LDR treatment is likely to be very costly. In addition, corrective action may impose high costs at some facilities.

EPA did not estimate the costs associated with land disposal restrictions because it is not possible, nor is it Agency policy, to estimate the effects of imposing regulations that do not yet exist. These economic impacts, if any, will be addressed by the Agency when it promulgates land disposal restriction treatment standards.

Nonetheless, EPA has, in both the September 25 proposed and today's final rule, estimated the costs associated with stabilizing residues from liquid waste treatment so as to make them amendable to land disposal. Therefore, while it is not possible, at present, to define BDAT (and thus, LDR impacts) for any wastes removed from the Bevill exclusion, EPA has attempted to capture some of the likely costs associated with future waste disposal activities.

Prospective corrective action costs are by nature site-specific and difficult to estimate. Currently available information does not allow EPA to estimate these costs with confidence. To the extent, therefore, that any additional facilities are brought into the subtitle C on-site waste management system by this rule, EPA may have underestimated cost and economic impacts. The reader is referred to section VII below for additional discussion of the specific features of the methodology employed. A commenter also indicated that the Agency also should recognize that commodity producers cannot pass compliance costs on to product consumers.

EPA responds that, in the Economic Impact Analysis provided in the September 25 NPRM, the Agency considered, on a commodity specific basis, the extent to which potential compliance costs could be passed through to consumers. As indicated in this analysis (and restated in Section I, below) EPA believes that the commenter's suggestion that all mineral processors in all commodity sectors are "price takers," having no ability to pass through cost increases and therefore having to absorb them internally, is demonstrably untrue.

One commenter maintained that in order to accurately estimate the economic and regulatory impacts of the proposed rule, EPA must first resolve the issues of the "mixture rule," retroactivity and regenerated wastes. In particular, one commenter charged that EPA has not considered, as required by Executive Order 12291, the economic impact of excluding chromium contaminated fill from Bevill status. Also, to truly identify the economic and regulatory impacts of the proposed rule, the Agency should obtain information from all inactive facilities.

EPA responds that these issues were addressed in the September 1, 1989 final rule and are not relevant to this rulemaking. To briefly restate the positions outlined in that final rule, however, EPA maintains that Subtitle C regulations will not be imposed retroactively. However, active management of an historical

accumulation of waste will subject a facility to Subtitle C regulations if the material exhibits one or more characteristics of a hazardous waste.

3. Compliance Cost, Market, and Economic Impact Estimates

a. Treated residue from roasting/leaching of chrome ore. According to one commenter, if the Agency imposes subtitle C requirements for chrome ore processing waste used as fill, on-site treatment of the fill will become burdensome and expensive. Also, if future excavated fill must be managed as a hazardous waste, depending on the amounts of hazardous waste involved, a severe economic burden may result without any commensurate gain in health or environmental benefits. In addition, loss of Bevill status for the chromium-contaminated fill at a City of Baltimore wastewater treatment plant in Patapsco, Maryland, may prematurely interrupt the process of developing treatment alternatives.

The Agency does not view this issue as relevant to the status of the 20 waste streams addressed in today's rule because it is not clear that the fill material is one of the mineral processing wastes covered by today's rule.

Commenters contended that the cost of compliance with RCRA subtitle C for inactive facilities should be addressed by EPA. A commenter maintained that the docket should include information on existing inactive waste sites as well as the number of chrome ore "fill" sites that will be affected by the proposed rule.

EPA responds that inactive facilities were not sampled because they are not pertinent to this rulemaking.

Several commenters disagreed with the compliance cost estimate for residue from roasting/leaching of chrome ore. One commenter argued that the waste should be retained in the Bevill exemption because of the significant costs that corrective action requirements could impose. According to the commenter, disposal and treatment costs will be at least an additional \$2 million over the Agency's estimate of compliance costs. Another commenter, however, claimed that because its waste stream is treated on-site under the facility's NPDES permit and the treated waste is non-hazardous, there is no need for its facility to modify in any way current treatment or disposal practices, and thus there is no cost for compliance if the waste stream is removed from the Bevill exclusion.

One commenter contended that the impact of the removal of residue from roasting/leaching of chrome ore from the Bevill exclusion was incorrectly

estimated because EPA did not fully evaluate all of the information provided in the National Survey of Mineral Processors. In addition, not all of the samples taken from the facility by EPA were analyzed.

EPA responds that it used available Method 1312 data to evaluate compliance with the low hazard criterion. Because of time constraints, the Agency analyzed the samples collected on an "as generated" basis prior to analyzing those collected on an "as managed" basis; the former are directly pertinent to and necessary for the Bevill rulemaking process while the latter are primarily of use in preparing the Report to Congress. Since publication of the September 25 proposal, however, the Agency has had an opportunity to analyze additional samples. Based upon these new analyses and analyses performed in support of the September 25 proposal, the Agency agrees that the *treated* residue from roasting/leaching of chrome ore does not exhibit hazardous characteristics and hence, would not be subject to new regulatory requirements and associated costs if removed from the Bevill exclusion. The treated waste is, however, being retained under the Bevill exemption because it is both low hazard and high volume.

b. Process wastewater from coal gasification. EPA received several comments arguing that removing process wastewater from coal gasification from the Bevill exemption would impose severe economic impacts and would not in any way enhance the environment. The commenters maintained that the additional \$1 million in annual compliance costs (commenter's estimate) are unreasonable and would accomplish nothing except for increasing compliance costs, in light of the reuse of the fluids in the same industrial process. EPA should not, they stated, impose economic burdens upon the industry. Also, one commenter asserted that North Dakota will lose substantial amounts of tax revenues and employment opportunities if RCRA subtitle C regulation makes it economically infeasible to continue operating the Great Plains facility. Commenters representing the electric utility industry claimed that additional regulatory controls under RCRA over wastewater discharges from coal gasification are unnecessary and burdensome to the electric utility industry because the wastewater discharges are subject to NPDES permits under the Clean Water Act.

US EPA ARCHIVE DOCUMENT

As discussed in section III, below, based upon further data in the form of a revised survey response provided by the facility in question, EPA now concludes that the waste stream does satisfy the high volume criterion and so will be retained for further study. Discussion of the prospective economic impacts of removing the waste from the Bevill exclusion as part of this rulemaking is, therefore, moot.

c. Furnace off-gas solids from elemental phosphorus production. One commenter agreed that due to the low cost of compliance with subtitle C regulations, treatment of furnace off-gas solids from elemental phosphorus production as hazardous wastes is reasonable and practicable. One elemental phosphorus industry commenter asserted that this company's waste stream is not hazardous, and therefore, no compliance costs will be incurred. EPA was unable to confirm this for the particular facility in question, and the commenter-supplied data was insufficient to confirm that the facility's waste will not exhibit a hazardous characteristic. The Agency has, accordingly, maintained its conservative approach to estimating potential cost and economic impacts associated with this rule by assuming that the waste is hazardous and that the facility will be affected by the rule even though this may not turn out to be the case.

d. Process wastewater from hydrofluoric acid production. One commenter reported that because of the co-mingling of fluorogypsum and process wastewater at the Calvert City, Kentucky plant, the annual estimated flow would be 2,900,000 metric tons per year, and not 103,526 metric tons per year as assumed in the Technical Background Document "Development of the Cost and Economic Impacts of Implementing the Bevill Mineral Processing Waste Criteria." Because these volumes differ by an order of magnitude, the effect on EPA's estimation of compliance costs for hydrofluoric acid waste streams subject to subtitle C at a Calvert City plant would be significant. As discussed below in section III, based upon further data in the form of a revised survey provided by one of the facilities in question and detailed written comments from the other, it appears that the waste stream meets the high volume criterion and the compliance costs that commenter claimed would be significant will in fact not be incurred.

e. Sulfate process waste solids from titanium dioxide production. One commenter questioned EPA's conclusion

that the proposed rule would have no economic impact on the commenter's facility. The commenter understands that under EPA's policy, non-excluded wastes which are disposed prior to the effective date of the rule which would make them subject to Subtitle C requirements would not be subject to direct Subtitle C controls such as closure and post-closure care requirements. In the commenter's case, solid wastes from the sulfate and chloride processes were accumulated in surface impoundments until October of 1988. Since that time, however, only non-hazardous wastes have been added. The commenter assumes that consistent with EPA's policy, these impoundments will not be subject to closure and post-closure requirements.

EPA responds that the commenter is correct in his assumption as long as the wastes previously placed in the surface impoundments are not actively managed after the effective date of today's rule. As discussed in the September 1, 1989 final rule, EPA will not be applying Subtitle C requirements retroactively. For further discussion of this issue see 54 FR 36592.

f. Wastes from phosphoric acid production. Commenters from the phosphate rock processing industry contended that the industry could not competitively withstand the costs of complying with Subtitle C or the LDR requirements. They contended that it is infeasible, if not impossible, to manage process wastewater from phosphoric acid production in compliance with subtitle C requirements, especially in view of the upcoming land disposal restrictions on characteristic wastes. It is essential that the Agency retain process wastewater from phosphoric acid in the Bevill Amendment exclusion.

As discussed below, EPA believes that process wastewater from phosphoric acid production complies with the high volume and low hazard criteria and therefore the waste stream is today retained within the Bevill exclusion. The need for and technical and economic feasibility of subjecting this material to Subtitle C requirements will be addressed in the Report to Congress.

F. Requests for Clarifications/Technical Corrections on the September 1, 1989 Final Rule

One commenter brought to the Agency's attention a difference between the preamble and rule language in the September 1, 1989 final rulemaking. In the preamble to the final rule, the Agency states that "roasting and autoclaving are considered beneficiation operations if they are used to remove

sulfur and/or other impurities in preparing an ore or mineral, or beneficiated ore or mineral, for leaching." (54 FR 36618) In addition, the commenter indicated that the Agency states that

chlorination is sometimes used prior to gold leaching operations in a procedure functionally identical to roasting and autoclaving (i.e., to change a sulfide ore to a chemical form more amenable to leaching). EPA recognizes that this type of pretreatment operation may be an integral part of leaching operations, and accordingly, considers non-destructive chlorination of ores, minerals, or beneficiated ores or minerals when used as a pretreatment step for leaching, to be a beneficiation operation. (54 FR 36618)

The commenter noted, however, that the language of the rule differs slightly and refers specifically only to "roasting in preparation for leaching." The commenter requested that EPA clarify the language of the September 1 final rule so that pretreatment autoclaving and chlorination, as well as roasting, are clearly considered beneficiation operations.

The Agency has reviewed the language of the September 1, 1989 final rule and agrees with the commenter that the rule could be read so that pretreatment autoclaving and chlorination might not be considered beneficiation activities. As discussed in the preamble, this was not the Agency's intention. Thus, the language of § 261.4(b)(7) has been revised in today's rule to read

"For purposes of this paragraph, beneficiation of ores and minerals is restricted to the following activities: * * * roasting, autoclaving, and/or chlorination in preparation for leaching (except where the roasting (and/or autoclaving and/or chlorination)/leaching * * *

G. Concerns With Administrative Procedures

Commenters on the proposed rule made a number of requests to the Agency regarding the procedures EPA has followed for administering the mineral processing rulemakings. One commenter requested that EPA defer final action on the proposed rule pending: (1) judicial review of the September 1, 1989 final rule; (2) clarification of the applicability of the rules to inactive processing facilities; and (3) a review of the mixture rule. Another commenter requested that the Agency publish its rationale and allow for public comment if EPA decides that process wastewater from the production of animal feed, ammoniated phosphate fertilizer, and phosphate complex ponds are not within the scope of the Bevill exclusion. The same commenter asked

US EPA ARCHIVE DOCUMENT

that all documents used for previous rulemakings be included in the current docket (MW2P). One commenter asked EPA to assess the analytical results of the hazard sampling data and carefully compare them with the commenter's own split samples. Finally, one commenter sought additional time for public review and comment on the background documents for the high volume criterion. The commenter claimed that the documents were not available for comment before the September 25th proposed rule, yet support the criterion made final in the September 1st rule.

Because of court-imposed deadlines, the Agency is compelled to promulgate today's final rule on an accelerated schedule (signature by January 15, 1990). In order to ensure that all information compiled for previous rulemakings is fully available to the public, the Agency has incorporated by reference previous mineral processing waste dockets, except for the final rule relisting six smelter wastes (53 FR 35412, September 13, 1988), into the current docket. EPA believes that the public has been provided an adequate opportunity to comment on this rulemaking and, therefore, an additional comment period is not required. In addition, EPA believes clarification of the applicability of the rules to inactive facilities and review of the mixture rule are not required or appropriate in the context of this rulemaking because EPA's position on these issues was established in the September 1, 1989 final rule.

III. Revised Application of the Final Criteria for Defining Bevill Mineral Processing Wastes

This section of the preamble presents clarifications to the waste stream definitions used in the proposal, revised waste volume data and additional discussion of selected data used in evaluating compliance with the low hazard criterion. Only those waste streams for which noteworthy changes have been made to the proposal are discussed in detail. A summary of the Bevill status of the 20 mineral processing wastes is also presented.

A. Clarification of Waste Stream Definitions

Based on careful review of public comments, and additional analysis of previous EPA studies and company responses to the 1989 National Survey of Solid Wastes from Mineral Processing Facilities, the Agency has made the following decisions concerning the definition of candidate Bevill waste streams, related process descriptions,

and the numbers of facilities generating each waste.

1. Treated Residue From Roasting/Leaching of Chrome Ore

The residue from roasting/leaching of chrome ore of concern in this rule is the settled residue following treatment of the slurried leaching waste. Both facilities that reported generating residue from roasting/leaching of chrome ore pump their untreated waste directly to an onsite treatment unit. In contrast to the September 25 NPRM, this final rule temporarily retains the exclusion from hazardous waste regulations for only those treated solids which are entrained in the slurry as it leaves the treatment facility and which settle out in disposal impoundments. Available data indicate that this mineral processing waste is both low hazard and high volume. As indicated in the proposal, the untreated waste is not low hazard.

2. Process Wastewater From Coal Gasification

The definition of process wastewater from the coal gasification operation has been revised to clarify that process wastewater from coal gasification is the "stripped gas liquor" generated during the gasification of the coal. This process wastewater may be run through several subsequent storage, treatment, and reuse operations. This stripped gas liquor was originally not nominated by the facility because of a misunderstanding about its status as a solid waste. In comments provided on the September 25 proposal, however, the company has requested that the entire stripped gas liquor stream be considered "process wastewater" rather than just the portion reported previously. EPA believes that the stripped gas liquor is a solid waste at the one facility that generates the waste, and has evaluated the extent to which the material complies with the final Bevill criteria accordingly. Because the facility's response to the 1989 National Survey indicates that the process stream, in part, is stored in surface impoundments, EPA does not consider its management system to be closed-loop recycling, meaning that for present purposes, the Agency believes this material is not eligible for the closed-loop exemption. However, this does not affect the Bevill status of the waste.

3. Slag Tailings From Primary Copper Processing

EPA has identified, as a result of public comments, an additional facility that processes slag from primary copper processing and thereby generates slag

tailings. This increases the number of facilities known by EPA to generate slag tailings to three.

4. Furnace Off-Gas Solids From Elemental Phosphorus Production

This waste stream will continue to be defined, depending on the facility in question, as either the solid or semi-solid material generated from the phosphorus furnaces or as the entrained solids contained within scrubber waters generated from cleaning furnace off-gases. In no instance is the scrubber water itself considered to be the candidate Bevill waste because it is not a high volume waste.

5. Process Wastewater From Phosphoric Acid Production

This waste stream, for purposes of determining Bevill status, includes the following process streams resulting from phosphoric acid plant operations: water from phosphoric acid production operations through concentration to merchant grade acid; phosphogypsum transport water; phosphogypsum stack runoff; process wastewater generated from the uranium recovery step of phosphoric acid production; process wastewater from animal feed production operations that qualify as mineral processing operations based on the definition of mineral processing that the Agency finalized on September 1; and process wastewater from superphosphate production. As proposed on September 25, phosphoric acid process wastewater is high volume and low hazard waste and is, therefore, retained in the exemption, although the data used to arrive at this conclusion have been modified in response to public comments.

6. Chloride Process Waste Solids From Titanium Tetrachloride Production

The "chloride-ilmenite" process reportedly employed by three titanium tetrachloride production facilities, for purposes of this rule, continues to be considered a processing operation. The primary reason for this determination is the understanding that during this "two-stage" process, the operation destroys the identity of the mineral, produces titanium tetrachloride gas (a mineral product), and generates wastes which are functionally identical to the wastes generated by the chloride process at the other six titanium tetrachloride facilities. The fact that the ore being utilized is of a different type and grade is not justification for classifying the operation as beneficiation. In addition, by the company's own admission, wastes from each part of the "two-step

US EPA ARCHIVE DOCUMENT

beneficiation-chlorination" process are not separable. Accordingly, the wastes generated by this chlorination process are subject to EPA's reinterpretation of the Mining Waste Exclusion that was finalized on September 1 and this rulemaking. Assessments of volume and hazard performed both for the September 1 final rule and the September 25 proposal included "chloride-ilmenite" facilities as well as other chloride process facilities. These previous assessments, as well as updates made in support of this final rule, indicate that chloride process waste solids from titanium tetrachloride production are high volume and low hazard and, therefore, are retained in the exemption. Other wastes generated by the chloride process (i.e., wastes other than the chloride waste solids) were classified as non-Bevill mineral processing wastes by the September 1 rule.

3. Compliance with the High Volume Criterion

Revised waste generation rate estimates for the 20 conditionally retained wastes are presented in Table 1. Many of these estimates have been revised since publication of the September 25 proposal, primarily because of three factors. First, revised definitions or clarifications of what constitutes the individual waste streams have led the Agency to in some cases include, remove, or otherwise revise data related to volume estimates for particular waste streams.

Second, EPA has revised estimates in a limited number of cases in direct response to new data or other information (e.g., clarification of survey responses) contained in public comments on the proposal.

Finally, EPA has, for this final rule, revised one average annual per-facility waste volume presented in Table 1, not because of new information, but because the Agency has included confidential business information (CBI) in the calculation, after determining that the data could be aggregated and used without disclosing proprietary information. The Agency notes that this estimate is essentially the same as that used to make the high volume determination for the proposed rule; the average annual per-facility waste volume presented in Table 1 of the proposal did not, however, include data from the CBI facilities. In cases where proprietary information would be revealed by presenting in Table 1 the actual average based on CBI data, the Agency has either completely withheld the data from the table (i.e., where the only two facilities in the sector both

requested confidentiality, e.g., chrome ore and titanium dioxide sulfate process), has presented the sole non-CBI facility volume (i.e., where only one of several facilities is non-CBI, e.g., copper calcium sulfate sludge and lead process wastewater) or has published an average based on the non-CBI data (i.e., where only one of several facilities in CBI, e.g., steel wastes).

The Agency wishes to reiterate that the fundamental source of data for evaluating compliance with the high volume criterion has been, and continues to be, the 1989 National Survey. In order to account for market fluctuations, EPA allowed facilities to submit information in public comment on the September 25 proposal explaining, as necessary, that the reported generation rates for 1988 did not accurately reflect typical waste generation rates at the facility. In response, a small number of facilities chose to revise their survey responses, as noted above, but none claimed that relying upon 1988 data *per se* would produce an inaccurate result. Accordingly, EPA has, for this final rule, relied exclusively, with one exception described below, on its own in-depth analysis of written responses to the National Survey to evaluate waste-by-waste compliance with the high volume criterion.

1. Treated Residue From Roasting/Leaching of Chrome Ore

With the clarification that the waste in question is the treated residue and not the waste as it leaves the leach operation, EPA has reviewed the CBI data reported for the treated waste and confirmed that the waste stream as defined is, indeed, a high volume waste solid. Both facilities generate the non-liquid Bevill waste at rates in excess of 45,00 mt per year.

2. Process Wastewater From Coal Gasification

With the determination that process wastewater from coal gasification is stripped gas liquor, EPA has reviewed the quantities of the total process water generated at the facility and confirmed that the waste stream as redefined is, indeed, a high volume liquid waste.

3. Calcium Sulfate Wastewater Treatment Plant Sludge From Primary Copper Processing

The Agency has reviewed its analysis of the volume data provided for this waste stream in the National Survey. EPA has determined that the waste volume presented in the proposed rule for the non-CBI facility is not representative of the calcium sulfate

sludge, but of the sludge and the combined transport liquid. The waste volume used to evaluate the status of the waste, therefore, has been revised to reflect the quantity of actual sludge generated. These revised numbers are consistent with (1) the estimates made for previous proposed and final rules regarding the reinterpretation of the Bevill exclusion and (2) volume estimates presented in the facility's comments regarding those proposals. EPA notes that a review of the data from the CBI facility leaves some doubt as to the point in the process at which the residual waste stream is the Bevill waste, and therefore which waste volume should be used. The Agency, however, has confirmed that even a conservative calculation using the smallest volume reported still yields an average which exceeds the 45,000 metric ton threshold for the high volume criterion. EPA concludes, therefore, that the waste stream meets the high volume criterion.

4. Slag Tailings From Primary Copper Processing

With the addition of the third facility to the group of facilities generating this waste, the Agency reviewed the available survey data and revised the industry average generation rate for slag tailings to take into account for all three facilities that generate the waste. After revision of the quantity estimates, the waste stream continues to pass the high volume criterion.

5. Furnace Off-Gas Solids From Elemental Phosphorus Production

Confidential Business Information for three elemental phosphorus facilities was included in the recalculation of the average waste volume presented in Table 1 of today's rule, and this value was used to evaluate compliance with the high volume criterion. These CBI data were also used to evaluate compliance with the high volume criterion for the September 25 proposal, but were not presented in the NPRM in an effort, which upon closer examination proves unnecessary, to protect the confidentiality of the data.

The average waste volume in Table 1 represents the actual solids generated from cleaning the furnace off-gas; in some cases, these solids may have been entrained in scrubber water.⁴ For EPA's calculations, however, the quantities of solids contained in these scrubber waters as reported in the surveys (either as percent solids in the scrubber water

⁴ The available data indicate that the scrubber water is not a high volume waste.

or quantity of sludge generated from scrubber water settling) were the volumes ascribed to those facilities for purposes of developing the sector-wide annual waste generation rate. The average per-facility volume of this waste continues to be below the high volume criterion.

6. Process Wastewater From Hydrofluoric Acid Production

The Agency proposed to withdraw this waste stream as a low volume waste due to the failure of the facilities to provide waste generation data in the comments in which the waste streams were originally nominated or in their responses to the National Survey. Both facilities reportedly producing Bevill waste from hydrofluoric acid production have subsequently presented the Agency with volume data in comments and (in one case) a revised facility survey. The Agency has reviewed these industry comments and the additional survey data and has concluded that process wastewater from hydrofluoric acid production satisfies the high volume criterion for liquids. As the waste stream has been determined to be low-hazard, the process wastewater is retained in the Bevill exclusion.

7. Process Wastewater from Primary Lead Production

The Agency has reevaluated its methodology for volume estimation of this waste stream, and has subsequently removed from the analysis one facility which was not operated on a consistent basis (37 days in 1988). The Agency's analysis indicates, however, that although removal of this facility from the analysis increases the average

annual per-facility waste volume, the process wastewater is not generated on a sector-wide basis in quantities sufficient to meet the high volume criterion. The waste stream, therefore, has been withdrawn from the Bevill exclusion. The value reported in Table 1 is the volume of process wastewater from the remaining non-CBI facility; this is not the actual sector facility average used to make the high volume determination.

8. Air pollution control dust/sludge from lightweight aggregate production

EPA has revised its estimate of the volume of this waste stream based on additional analysis of information included in the surveys submitted by the majority of the lightweight aggregate facilities. Waste management data submitted in the survey were analyzed to determine more accurately the actual generation of solids, in lieu of basing the estimates on solids entrained in wastewaters. These revised estimates, confirmed by data submitted by commenters addressing the earlier proposed reinterpretations, were used to calculate a new sector average for the waste stream. The Agency acknowledges that the facilities that use air pollution controls other than wet scrubbers, a minority in the sector, have not been represented in the analysis because data are not available on the quantities of APC dust that these facilities may generate. Data collected in the National Survey for the iron and steel industry, however, indicates that APC dust resulting from dry collection methods is typically of lower volume than sludges generated from wet scrubbers. As a result, EPA believes that

inclusion of APC dust volume data in the analysis would not increase the facility average, much less double the average as would be needed to meet the high volume criterion. Based on EPA's revised estimate, air pollution control dust/sludge from lightweight aggregate production does not pass the high volume criterion and is hereby withdrawn from the Bevill exclusion.

9. Sulfate Process Waste Solids from Titanium Dioxide Production

Waste solids from the production of titanium dioxide using the sulfate process are removed from the processing operations and managed in multiple ways at the two facilities that employ the sulfate process. In its original response to the 1989 National Survey, one facility reported an aggregated volume of waste solids from chloride and sulfate processing operations. Because EPA was unable to disaggregate the volume of wastes from chloride v. sulfate processing operations at this facility, EPA used data provided by the other sulfate process facility as the basis for the average annual per facility waste generation rate in the proposal. In comments on the proposed rule, the facility that had previously reported aggregated volume data provided separate volume data for chloride and sulfate process waste solids. As a result, for today's proposal, EPA has developed a revised per-facility average annual waste generation rate that is based on data from both facilities. However, as in the proposal, the waste is not high volume. The waste stream, therefore, has been withdrawn from the Bevill exclusion.

TABLE 1.—RESULTS OF APPLYING THE HIGH VOLUME CRITERION TO TWENTY CONDITIONALLY RETAINED PROCESSING WASTES*

Commodity sector	Conditionally retained waste	Solid or liquid	Average per facility generation (mt/yr)	Notes	No. of facilities reporting	Passes high volume criterion
Coal gas	Gasifier ash	Solid	240,000	B	1	Yes.
Coal gas	Process wastewater	Liquid	4,830,000	C	1	Yes.
Copper	Calcium sulfate wastewater treatment plant sludge.	Solid	78,000	A, B, D	2	Yes.
Copper	Slag tailings	Solid	503,915	C	3	Yes.
Elemental phosphorus	Furnace off-gas solids	Solid	11,044	A, C	5	No.
Hydrofluoric acid	Fluorogypsum	Solid	266,780	C	2	Yes.
Hydrofluoric acid	Process wastewater	Liquid	4,300,000	C	2	Yes.
Iron	Air pollution control dust/sludge	Solid	51,662	B, C	24	Yes.
Iron	Blast furnace slag	Solid	724,506	B	26	Yes.
Lead	Process wastewater	Liquid	856,000	A, C, D	5	No.
Lightweight aggregate	Air pollution control dust/sludge	Solid	15,813	B, C	17	No.
Magnesium	Anhydrous process wastewater	Liquid	2,465,000	B	1	Yes.
Phosphoric acid	Process wastewater	Liquid	67,402,800	A, B, C	18	Yes.
Sodium chromate/bichromate	Treated residue from roasting/leaching of chrome ore.	Solid	W/H	A, B	2	Yes.
Steel	Basic oxygen furnace and open hearth furnace air pollution control dust/sludge.	Solid	60,892	A, C, E	25	Yes.
Steel	Basic oxygen furnace and open hearth furnace slag.	Solid	553,844	A, B	28	Yes.
Titanium dioxide	Sulfate process waste acids	Liquid	W/H	A, B	2	Yes.

US EPA ARCHIVE DOCUMENT

TABLE 1.—RESULTS OF APPLYING THE HIGH VOLUME CRITERION TO TWENTY CONDITIONALLY RETAINED PROCESSING WASTES*—Continued

Commodity sector	Conditionally retained waste	Solid or liquid	Average per facility generation (mt/yr)	Notes	No. of facilities reporting	Passes high volume criterion
Titanium dioxide.....	Sulfate process waste solids.....	Solid.....	W/H	A, C	2	No.
Titanium tetrachloride.....	Chloride process waste solids.....	Solid.....	89,349	A, B	9	Yes.
Zinc.....	Slag.....	Solid.....	157,000	B	1	Yes.
Total number of wastes meeting high volume criterion.....						16
Total number of wastes failing high volume criterion.....						4

*Data are from 1989 National Survey of Solid Wastes from Mineral Processing Facilities, except as noted.

W/H—withheld to avoid disclosing confidential business information (CBI).

A. The data for one or more of the generating facilities are CBI.

B. Generation data are obtained directly from the survey.

C. Calculated or interpreted by EPA based on information provided in the survey and public comments.

D. Data presented is from one facility; one or more of the generating facilities are CBI. Reported number was not used to make Bevill determination; average including CBI facilities does not change Bevill status.

E. Generation data was obtained from the survey for 12 facilities; data for 13 facilities was reported by AISI.

C. Compliance with the Low Hazard Criterion

Consistent with the low hazard criterion established on September 1, 1989, the Agency has used only waste analysis data derived using EPA Method 1312 because there was no compelling evidence that any of the 20 mineral processing wastes "is generated at five or more facilities; and substantial additional relevant data are available and the preponderance of these additional data indicate that the waste should be considered low hazard." (See 54 FR 36630.) The majority of the Method 1312 data used are the result of EPA sampling at selected facilities, but some results are for split samples or other sample analysis results provided by operating facilities.

In addition, for today's final rule, the Agency has utilized newly available data from EPA's 1989 waste sampling effort to make low hazard determination

for certain waste streams or components of waste streams that may have been included by redefinition or clarification of the waste stream or the operation's process in today's final rule. Final results of EPA's application of the low hazard criterion are presented in Table 2.

1. Treated Residue from Roasting/Leaching of Chrome Ore

With the clarification that the waste in question is the treated residue from roasting/leaching of chrome ore and not the waste as it leaves the leaching operation, EPA has reviewed its waste sampling data of the treated residue, and has confirmed that the treated residue passes the low hazard criterion.

2. Process wastewater from coal gasification

With the determination that process wastewater from coal gasification is

"stripped gas liquor," EPA has reviewed the sampling data for the stripped gas liquor generated at the facility, and established that the waste stream as redefined is a low hazard liquid waste.

3. Process wastewater from primary lead production

The Agency has responded to concerns from one commenter that a composite wastewater sample taken at one facility was not a sample of their process wastewater, but included additional process waste streams. In response, EPA analyzed non-composited samples of slag granulation water, which reportedly accounts for more than 90 percent of the process wastewater at this facility. This sample was found to exceed the low hazard criterion. Because the process wastewater also exceeded the criterion at a second facility, EPA concludes that this waste stream is not low hazard.

TABLE 2.—RESULTS OF APPLYING THE LOW HAZARD CRITERION TO TWENTY CONDITIONALLY RETAINED MINERAL PROCESSING WASTES

Commodity sector	Conditionally retained waste	No. of fac. believed to generate waste	No. of fac. sampled by EPA	No. of fac. submitting method 1312 data	Passes low hazard criterion	Reason for failure
Coal gas.....	Gasifier ash.....	1	1	0	Yes.....	N/A
Coal gas.....	Process wastewater.....	1	1	0	Yes.....	N/A
Copper.....	Calcium sulfate wastewater treatment plant sludge.....	2	2	0	Yes.....	N/A
Copper.....	Slag tailings.....	2	2	1	Yes.....	N/A
Elemental phosphorus.....	Furnace off-gas solids.....	5	2	0	Yes.....	N/A
Hydrofluoric acid.....	Fluorogypsum.....	3	2	1	Yes.....	N/A
Hydrofluoric acid.....	Process wastewater.....	3	2	0	Yes.....	N/A
Iron.....	Air pollution control dust/sludge.....	30	4	0	Yes.....	N/A
Iron.....	Blast furnace slag.....	30	4	0	Yes.....	N/A
Lead.....	Process wastewater.....	5	3	0	No.....	As, Cd, Pb
Lightweight aggregate.....	Air pollution control dust/sludge.....	28	2	0	Yes.....	N/A
Magnesium.....	Anhydrous process wastewater.....	1	1	0	Yes.....	N/A
Phosphoric acid.....	Process wastewater.....	28	2	0	Yes.....	N/A
Sodium chromate/bichromate.....	Treated residue from roasting/leaching of chrome ore.....	2	2	0	Yes.....	N/A

US EPA ARCHIVE DOCUMENT

TABLE 2.—RESULTS OF APPLYING THE LOW HAZARD CRITERION TO TWENTY CONDITIONALLY RETAINED MINERAL PROCESSING WASTES—Continued

Commodity sector	Conditionally retained waste	No. of fac. believed to generate waste	No. of fac. sampled by EPA	No. of fac. submitting method 1312 data	Passes low hazard criterion	Reason for failure
Steel	Basic oxygen furnace and open hearth furnace air pollution control dust/sludge.	27	3	0	Yes	N/A
Steel	Basic oxygen furnace and open hearth furnace slag.	27	3	0	Yes	N/A
Titanium dioxide	Sulfate process waste acids	2	2	0	No	pH, Cr
Titanium dioxide	Sulfate process waste solids	2	2	0	Yes	N/A
Titanium tetrachloride	Chloride process waste solids	9	3	0	Yes	N/A
Zinc	Slag	1	1	0	Yes	N/A
Total number of wastes meeting low hazard criterion						18
Total number of wastes failing low hazard criterion						2

D. Bevill Status of Conditionally Retained Mineral Processing Wastes

The Bevill status of the 20 conditionally retained mineral processing wastes is presented in Table

3. Fifteen of the 20 wastes have been retained and will be studied in the Report to Congress and addressed by the subsequent Regulatory Determination. The other five wastes,

will, as of the effective date of this rule, become subject to regulation as hazardous wastes under subtitle C of RCRA if they exhibit hazardous characteristics.

TABLE 3.—RESULTS OF APPLYING BOTH BEVILL CRITERIA TO TWENTY CONDITIONALLY RETAINED MINERAL PROCESSING WASTES

Commodity sector	Conditionally retained waste	No. of fac. believed to generate waste	Passes high volume criterion	Passes low hazard criterion	Retained within Bevill exclusion
Coal Gas	Gasifier ash	1 Yes	Yes	Yes	
Coal Gas	Process wastewater	1 Yes	Yes	Yes	Yes.
Copper	Calcium sulfate wastewater treatment plant sludge	2 Yes	Yes	Yes	Yes.
Copper	Slag tailings	2 Yes	Yes	Yes	Yes.
Elemental Phosphorus	Furnace off-gas solids	5 No	No	Yes	No.
Hydrofluoric Acid	Fluorogypsum	3 Yes	Yes	Yes	Yes.
Hydrofluoric Acid	Process wastewater	3 Yes	Yes	Yes	Yes.
Iron	Air pollution control dust/sludge	30 Yes	Yes	Yes	Yes.
Iron	Blast furnace slag	30 Yes	Yes	Yes	Yes.
Lead	Process wastewater	5 No	No	No	No.
Lightweight Aggregate	Air pollution control dust/sludge	28 No	No	Yes	No.
Magnesium	Anhydrous process wastewater	1 Yes	Yes	Yes	Yes.
Phosphoric Acid	Process wastewater	28 Yes	Yes	Yes	Yes.
Sodium Chromate/Bichromate	Treated residue from roasting/leaching of chrome ore.	2 Yes	Yes	Yes	
Steel	Basic oxygen furnace and open hearth furnace air pollution control dust/sludge.	27 Yes	Yes	Yes	Yes.
Steel	Basic oxygen furnace and open hearth furnace slag	27 Yes	Yes	Yes	Yes.
Titanium Dioxide	Sulfate process waste acids	2 Yes	No	No	No.
Titanium Dioxide	Sulfate process waste solids	2 No	No	Yes	No.
Titanium Tetrachloride	Chloride process waste solids	9 Yes	Yes	Yes	Yes.
Zinc	Slag	1 Yes	Yes	Yes	Yes.
Total number of wastes retained within Bevill exclusion					15
Total number of wastes withdrawn from Bevill exclusion					5

V. Analysis of and Response to Comments on Clarification to the Definition of "Designated Facility" and Modification of the Standards Applicable to Generators of Hazardous Waste

In the proposed rule of September 25, 1989, EPA proposed a clarification to the definition of designated facility regarding waste shipments from a state where a waste is subject to the hazardous waste regulations to a state where the waste is not yet regulated as

hazardous. This circumstance can arise when EPA lists or identifies a new waste as hazardous under its pre-HSWA authority. In such a case, the waste is subject to RCRA hazardous waste regulations only in those states that do not have interim or final authorization to operate the RCRA program. In a state authorized by EPA to operate a hazardous waste program in lieu of the federal program (under the authority of section 3006 of RCRA), the waste would not be subject to RCRA

requirements until the state revises its program to classify the waste as hazardous and receives EPA authorization for these requirements. This set of circumstances results from the fact that RCRA allows states a specified time to adopt new regulations in order to minimize disruptions to the implementation of authorized state programs. In contrast, that situation does not occur when the wastes are newly listed or identified pursuant to the HSWA authorities since Congress

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

specified that HSWA provisions are to be implemented by EPA in all states until such time as states are authorized to implement the new regulations.

EPA's generator regulations require a generator of hazardous waste to "designate on the manifest one facility which is permitted to handle the waste described on the manifest." (See 40 CFR 262.20). The regulations clearly state that the facility designated on the manifest is the "designated facility" as defined in § 260.10 (See the direct reference in the definition of "designated facility" to the manifest requirement in § 262.20). A designated facility as currently defined in 40 CFR 260.10 must either (1) have an EPA permit (or interim status) in accordance with parts 270 and 124, (2) have a permit from a state authorized in accordance with part 271, or (3) be a recycling facility that is regulated under § 261.6(c)(2) or subpart F of part 266, and must also be designated on the manifest by the generator pursuant to § 262.20.

It has become apparent that when promulgated in 1980, the definition of "designated facility" did not contemplate the above situation which has potentially broad impacts on the RCRA program. EPA's current interpretation of the statute is that the manifest requirement and the definition do not apply to materials that are not officially identified as RCRA hazardous wastes in the state that is receiving the wastes. Today's clarification amends the definition of "designated facility" and the standards applicable to generators of hazardous waste in 40 CFR 262.23, in order to make this interpretation clear to the public and the regulated community.

A. General Comments on the Proposed Definition

A number of commenters supported EPA's effort to clarify the existing regulations so that the parties affected by non-HSWA waste identifications and listings know the status of these wastes and the management standards that apply to them when they are shipped across state borders. These commenters indicated that the proposed revision to the definition of "designated facility" in § 260.10 offers additional clarity and an appropriate level of flexibility to assist both the regulatory agencies and the regulated community. Several commenters also supported the proposed change to § 262.23 by adding paragraph (e) to clarify the requirement that the generator must ensure that the designated facility returns the manifest to the generator to complete the waste tracking procedures as required by RCRA regulations.

Two commenters argued that the statute prohibits EPA from making this change to the definition of designated facility. These commenters pointed out that RCRA Section 3002 (a)(5), which sets out standards applying to hazardous waste generators, requires use of a manifest system

* * * to assure that *all such hazardous waste* is designated for treatment, storage or disposal in and arrives at, treatment, storage, or disposal facilities (other than facilities on the premises where the waste is generated) for which a permit has been issued as provided in the subtitle * * * (emphasis added).

Section 3003(a)(4), pertaining to transporters, contains substantially similar language.

The commenter argues that these provisions require materials that officially have the status of RCRA hazardous waste to go to facilities holding Subtitle C permits. EPA generally agrees with this view. EPA, however, notes that the mining wastes that become hazardous wastes as a result of this federal rule will not have official status as RCRA Subtitle C wastes in all states at the same time. New RCRA rules—including new waste identification rules—that are promulgated using statutory authorities in effect before the 1984 HSWA amendments take effect only in states that are not yet authorized to implement the pre-1984 RCRA hazardous waste program. Currently, only 7 states lack authorization for the pre-1984 program. Consequently, today's rule will take effect only in those states. In all other states, Subtitle C regulation of these wastes must wait for the states to promulgate parallel regulations or statutory changes, and obtain EPA approval to implement these new additions to their Subtitle C programs. This process can take many months. See generally 50 FR 28729-28730 (July 15, 1985), describing RCRA Section 3006. See also the state authorization section to today's notice.

Consequently, EPA believes that the "permitted facility" requirements of sections 3002(a)(5) and 3003(a)(4) apply only within the boundaries of those states where the relevant mining wastes have officially attained the status of RCRA-regulated subtitle C "hazardous wastes." Status as a "hazardous waste" is, indeed, the basic prerequisite for the exercise of any subtitle C jurisdiction. If a material is not yet a hazardous waste in the state to which it is sent for treatment, storage, or disposal, no subtitle C regulations apply. A manifest is not legally required, and the facility that accepts the waste need not have a

subtitle C permit. EPA, in fact, would be unable to enforce manifest and permitting requirements in a state where a material is not yet a subtitle C hazardous waste.

Since at least two interpretations of the statute are possible, EPA may exercise its discretion to choose the view that best promotes the overall policy goals of RCRA. EPA believes that there are sound policy considerations favoring the "jurisdictional" view, which considers the materials RCRA hazardous waste status to be a jurisdictional prerequisite.

The commenters' interpretation of RCRA sections 3002(a)(5) and 3003(a)(4) would force newly regulated wastes that are generated in unauthorized states to be managed in those states. Essentially, these wastes would be "trapped" in these unauthorized states, and they could only be managed in avoidance with the treatment, storage, and disposal alternatives that are available in those states (which could be limited). This is primarily because TSD facilities in authorized states would not be able to obtain the necessary permit modification or change in interim status. Since the wastes are not yet hazardous in these states. One problem which can arise from this situation is that the facilities best suited to the management of wastes which are newly listed or identified may not be located in the states where the rulemaking is in effect. The Agency believes that such facilities should not be precluded from accepting wastes from states where the rule is in effect while the state in which they are located is seeking authorization for the waste stream.

One example of particular interstate concern involves a mixed waste stream (i.e., a waste stream that contains both hazardous waste and radioactive waste) called scintillation cocktails. Scintillation cocktails are commonly generated by approximately 10,000 hospitals and universities across the country. This waste stream became regulated pursuant to non-HSWA authority as described in the July 3, 1986, Federal Register notice, and therefore were initially regulated under the RCRA program only in the unauthorized states. Approximately 80 percent of the national capacity for treatment of these particular wastes resides with one facility. The Agency understands that this facility is in compliance with state standards that are equivalent to the federal RCRA requirements. However, the facility is located in a state that has not yet received mixed waste authorization, and therefore the facility does not have a

RCRA permit or interim status. If all these scintillation cocktails were required to go to RCRA permitted facilities as suggested by these commenters, a significant number of waste shipments from thousands of generators would be disrupted. In fact, in this case the Agency believes that such a restriction would generally result in less protective waste management since it is doubtful that the wastes would be treated and recovered to the same degree as is presently occurring at this large facility.

The Agency would also like to point out that, without the flexibility provided by today's rule, there would likely be a significant disincentive for states to adopt new waste listings unless they were confident that adequate treatment, storage, or disposal capacity exists for wastes within the state. This is because generators in the first few states to adopt the waste listing would not be able to send their wastes to facilities in other authorized states (which are the vast majority of states) that have not adopted the listing because the TSD facilities in these states would not be able to obtain the necessary RCRA permit modifications or changes in interim status. EPA believes that this disincentive would not be desirable.

The same two commenters, in arguing that EPA's proposal should be withdrawn, contended that there is no firm evidence that the problem hypothetically facing the regulated community actually exists. The commenters stated that the problem is minuscule, if not completely illusory. The commenters indicated that the problem that EPA attempts to address in the rulemaking could only arise if EPA lists and identifies a waste as hazardous pursuant to non-HSWA authorities; the generator needs to send the waste off-site and the only available off-site waste facilities capable of managing the waste are located in authorized states. The commenters indicated this scenario could occur in only a very limited number of circumstances, and therefore does not warrant any change to the definition of designated facility. The commenters go on to say that EPA can only identify three non-HSWA rulemakings resulting in newly listed or identified wastes.

EPA strongly disagrees with the statement that this is an illusory problem for the following reasons. In the September 25 proposal, EPA identified three recent non-HSWA rules only as illustrative examples of situations where interstate shipments could be a problem. However, there have been other non-HSWA rules that list or bring in new

waste streams, namely: Redefinition of solid waste (January 4, 1985); and mixed waste (July 3, 1986). Furthermore, the Agency recently proposed additional non-HSWA listings for wood preserving wastes, and may in the future consider the regulation of other waste streams under the Agency's pre-HSWA authority. Furthermore, as discussed in the mixed waste scintillation cocktail example above, the Agency has already encountered situations of interstate shipments affecting thousands of generators, indicating that the problem being addressed in today's rule is a real one and deserves clarification.

The same two commenters argued that EPA's proposal could create a disincentive for waste generators to ship their wastes to licensed hazardous waste facilities. This disincentive could result from allowing the generator to choose to ship its hazardous waste to either a hazardous waste facility or a nonhazardous waste facility. Given the alternatives, a generator may simply choose the least cost option.

The Agency acknowledges that this approach to interstate shipments may appear to be a disincentive to the management of these hazardous wastes in subtitle C facilities. However, the Agency believes that there are other circumstances that mitigate this apparent disincentive. First, this situation is temporary. States are required to adopt federal RCRA waste listings or identifications within specified deadlines. Second, until that regulatory adoption, these wastes will be regulated under subtitle D of RCRA and any other applicable requirements of the receiving state. Last, some generators will elect to send their wastes to subtitle C facilities or other facilities that perform equivalent treatment in order to minimize any potential future liability resulting from the management of their wastes.

The two commenters also noted that the practice of shipping newly listed or identified wastes to facilities in states where the waste is unregulated would be limited to the period of time an authorized state requires to promulgate the new listing or characteristic. However, the commenters maintained that while such a period is finite, it is not necessarily short and can take up to three and a half years, assuming that authorized states comply with EPA regulations for revising state programs. The commenter further indicated that there are no immediate consequences for the state or the regulated community in that state if the state fails to meet these deadlines.

It should be recognized that the three and a half year period is the maximum allowed by the state authorization regulations. Generally, states are required to adopt federal program changes within two years (or three years if the state needs to amend its statute). Some extensions of these deadlines are available. However, EPA recognizes that while some states have been able to meet the authorization deadlines, others have not due to the number and complexity of the changes to RCRA regulations in the past few years. The Agency intends to place increased emphasis on prompt state adoption of new waste listings to ensure uniform, national coverage of newly listed or identified wastes. It should also be noted that there is a lag time between state adoption of a requirement and the official EPA action to authorize that state to implement the regulation under RCRA authority. Therefore, in many cases states are regulating these new activities in a manner equivalent to the RCRA program well before they have received authorization.

B. Relationship Between Today's Clarification and Non-RCRA State Hazardous Wastes

One commenter was concerned about the situation where a waste is generated in a state which, as a matter of state law only, regulates the waste as hazardous, but is transported to a receiving state that does not. In this case, the receiving state is under no federal compulsion to amend its regulations to add that waste to its list of hazardous wastes, since the listing of the non-RCRA waste is a matter of state law. EPA has no jurisdiction over this situation. Thus, this clarification of the definition of designated facility does not apply to state listed non-RCRA hazardous waste.

A second commenter shared the above concern but also stated that EPA's proposed clarification does not distinguish between state and federally classified hazardous waste. The commenter contended that the Agency should stipulate that this clarification only applies to federally regulated wastes, that the Agency did not intend to preclude the receiving state from designating the type of facility which can manage such state-classified hazardous waste, and that federal authorization is irrelevant to the interstate transportation of state-classified wastes.

The Agency recognizes the issue presented by the commenter; however, EPA believes that this is not a comment on the clarification to the definition of the term "designated facility" as

US EPA ARCHIVE DOCUMENT

proposed on September 25, 1989. Rather, the issue raised by this commenter concerns the requirements of the current definition. Indeed, the current definition does not apply to non-RCRA hazardous wastes since it only applies to the hazardous wastes that the Federal government has authority to regulate (i.e., federally listed or identified hazardous wastes). If a state chooses to be more stringent and regulate additional wastes not regulated under RCRA, that state must adapt its RCRA regulations with regard to the definition of designated facility to accommodate these new wastes. Each state must determine, therefore, how it will regulate the out-of-state shipment of state-listed wastes. Furthermore, the Agency does not, under the original definition or this subsequent clarification, intend to specify to authorized states the types of facilities that can manage state-classified hazardous wastes. Finally, EPA also does not, with this clarification of the original rule, seek to regulate the interstate transportation of state-classified wastes. Neither the original Federal definition, nor today's clarification has any impact on the state regulation of state-classified hazardous wastes or the out-of-state shipment of these wastes.

D. Which Standards Apply to Interstate Shipments?

Another commenter argued that the standards of the state where the generator is located should apply to the treatment, storage, or disposal of hazardous waste, rather than the standards of the receiving state because it would be extremely burdensome for the generator of a hazardous waste to keep track of the continuously evolving hazardous waste regulations of all fifty states.

The Agency disagrees with this commenter. A state can only apply its laws and regulations to facilities over which they have jurisdiction (i.e., facilities within the stated boundaries). Therefore, if a generator is sending wastes to a facility out-of-state, the treatment, storage, or disposal standards that apply are those of the state where the TSD facility is located. It is incumbent on the generator to know the requirements of the states where the wastes will be managed. However, much of the responsibility for complying with the receiving state's regulations falls on the TSD facility. In most cases, the generator simply has to ask a potential receiving TSD facility if it is allowed to manage the generator's wastes by its state government. The Agency does not believe that this is particularly burdensome to the generator.

E. Other Comments

A minor technical correction is also included in the rule language of "designated facility" to clarify that an interim status facility in an authorized state may be a designated facility. EPA believes that it is universally understood that these interim status facilities can accept hazardous waste shipments, and this was the original intent of the provision. Therefore, in the first sentence of the rule a parenthetical clause is added with the words "or interim status".

The Agency has noted and corrected the typographical error that appeared in the proposed rule as follows: Under proposed § 260.10(4), the generator is designated on the manifest pursuant to § 262.20, not § 260.20.

F. Manifesting requirements

Today's clarification will not alter the requirement that a generator offer his waste only to transporters who have EPA identification numbers. (See 40 CFR 262.12(c)). Thus, if a newly listed waste is transferred between transporters in a state where the waste is not yet hazardous, both transporters should be identified on the manifest. The initial

transporter is still required to keep the copy of the manifest on file.

In order to ensure that the waste reaches the designated facility, EPA is requiring the generator to arrange that the designated facility owner or operator sign and return the manifest to the generator, and that out-of-state transporters sign and forward the manifest to the designated facility. The return of the manifest to the generator will "close the loop" on the disposition of the generated waste and allow the generator to attempt to resolve any discrepancies in the manifest, as required by 40 CFR 262.42. This new requirement parallels the requirements in 40 CFR 264.71 and 265.71. However, as opposed to those sections, which require the receiving facility to return the manifest, § 262.23(e) puts the burden on the generator to ensure the return of the manifest when the waste is sent to a facility in a state not yet authorized to treat the waste as hazardous. EPA believes that this approach is appropriate, since the facility receiving the waste and any out-of-state transporters may not be subject to subtitle C regulation, if they do not otherwise handle any RCRA hazardous wastes. It should be noted that with this approach the designated facility and out-of-state transporters are not required to obtain EPA identification numbers since the waste is not hazardous in their state. (Of course, once the state becomes authorized to regulate the particular waste as hazardous, the facility would need a RCRA Subtitle C permit (or interim status) to continue managing the waste and all transporters would need EPA identification numbers.)

V. Regulatory Implementation and Effective Dates of the Final Rule

EPA is finalizing this rule in accordance with the March 14, 1989 order of the U.S. Court of Appeals for the D.C. Circuit (see *Environmental Defense Fund v. EPA*, 852 F.2d 1316 (D.C. Cir. 1988) cert. denied, 109 S.Ct. 1120 (1989)). As of the effective date of this final rule (i.e., six months after today or July 23, 1990, the five mineral processing wastes for which the temporary exemption from subtitle C regulations (previously provided by RCRA section 3001(b)(3)(A)(ii)) is being removed by today's rulemaking may be subject to subtitle C requirements in those states that do not have authorization to administer their own hazardous waste programs in lieu of EPA. Generators, transporters, and treatment, storage, and disposal (TSD) facilities that manage any of these five

wastes in authorized states will be subject to RCRA requirements imposed as a result of this final rule only after the state revises its program to adopt equivalent requirements and EPA authorizes the revision.

The requirements imposed as a result of removing the temporary exemption include: Determining whether the solid waste(s) exhibit hazardous characteristics (40 CFR 262.11) and, for those wastes that are hazardous, obtaining an EPA identification number for managing hazardous wastes (40 CFR 262.34); complying with recordkeeping and reporting requirements (40 CFR 262.40-262.43); and obtaining interim status and seeking a permit (or modifying interim status, including permit applications or modifying a permit, as appropriate) (40 CFR Part 40).

Section 3010 Notification

When EPA published its September 1, 1989 final rule (54 FR 36592), the Agency moved the temporary exemption from subtitle C regulations for all but twenty-five mineral processing wastes. In that rulemaking, the Agency indicated that all persons generating, transporting, treating, storing, or disposing of one or more of those wastes were to notify either EPA or an authorized state within 90 days (i.e., by November 30, 1989) of such activities, pursuant to section 3010 of RCRA, if those wastes are characteristically hazardous under 40 CFR part 261, subpart C. (see 54 FR 36632.) Following the publication of the September rule, however, a number of facilities expressed confusion regarding the notification requirement because section VII of the preamble to the September 1, 1989 final rule also states that "the final rule is not effective in authorized states because its requirements are not being imposed pursuant to the Hazardous and Solid Waste Amendments of 1984." (See 54 FR 36633). This statement was correct in regard to the requirement to file a part A permit application and TSD standards. It was not correct in regard to section 3010 notification, which was intended to apply to all persons generating, transporting, treating, storing or disposing of hazardous wastes identified by characteristics regardless of whether an authorized state or not. Because the September 1, 1989 final rule removed the temporary exemption and thus identified as characteristically hazardous some wastes, section 3010 required notification within 90 days. Because some potentially affected facilities may have been confused by the September 1 preamble and because the Agency has not yet published a

clarification, EPA is today eliminating the notification requirement established by the September 1 final rule for facilities in authorized states. For facilities in unauthorized states, the deadline for compliance with the notification requirement established by the September 1 rule is being extended until 90 days following today's publication (i.e., April 23, 1990). EPA has concluded that it is appropriate to waive the notification requirement in authorized states because (1) the universe of newly regulated activities will be identified when state regulations are revised, as they must be for the states to retain authorization; and (2) RCRA identification numbers provided to notifiers in authorized states are obtained by the state from EPA, so in this way EPA is informed of the notifications that authorized states receive.

Accordingly, not later than 90 days following today's publication (i.e., April 23, 1990), all persons in unauthorized states who generate, transport, treat, store, or dispose of wastes that (1) are removed from the Beville exemption by this final rule, and (2) are characteristically hazardous under 40 CFR part 261, subpart C, must notify EPA of such activities pursuant to Section 3010 of RCRA. Notification instructions are set forth in 45 FR 12746.

Persons who previously have notified EPA or an authorized state of their activities pursuant to section 3010 of RCRA, (i.e., persons who previously have notified EPA or an authorized state that they generate, transport, treat, store or dispose of hazardous waste and have received an identification number—see 40 CFR 262.12, 263.11 and 265.1) need not re-notify.⁵ Persons without EPA identification numbers are prohibited from transporting, offering for transport, treating, storing, or disposing of hazardous wastes.

For the same reasons discussed above, facilities managing wastes removed from the exclusion in authorized states need not notify EPA or an authorized state within 90 days of today's rule. Section 3010 Notification will be required of such facilities after the state receives authorization or otherwise amends its program to regulate these or require such notification.

⁵ Under the Solid Waste Disposal Amendments of 1980, (Pub. L. 96-482) EPA was given the option of waiving the notification requirement under section 3010 of RCRA following revision of the section 3001 regulations, at the discretion of the Administrator.

B. Compliance Dates for Today's Rule

1. Interim Status and Permit Modifications in Unauthorized States

Facilities in unauthorized states that currently treat, store, or dispose of wastes that have been removed from temporary Beville exclusion and are characteristically hazardous under 40 CFR Part 261, Subpart C, but have not received a permit pursuant to Section 3005 of RCRA and are not operating pursuant to interim status, may be eligible for interim status (see Section 3005(e)(1)(A)(ii) of RCRA, as amended). In order to operate pursuant to interim status, such facilities must submit a Section 3010 notice pursuant to 40 CFR 270.70(a) within 90 days of today's final rule (i.e., by April 23, 1990,⁶ and must submit a part A permit application within six months of today's final rule (i.e., by July 23, 1990). Under section 3005(e)(3), land disposal facilities qualifying for interim status under section 3005(e)(1)(A)(ii) must also submit a part B application and certify that the facility is in compliance with all applicable ground-water monitoring and financial responsibility requirements within 18 months of today's final rule (i.e., by July 23, 1991). If the facility fails to do so, interim status will terminate on that date.

Completion of final permit application will require individual facilities to develop and compile information on their on-site waste management operations including, but not limited to, the following activities: Ground-water monitoring (if waste management on land is involved); manifest systems, recordkeeping, and reporting; closure and, if appropriate, post-closure requirements; and financial responsibility requirements. The permit applications may also require development of engineering plans to upgrade existing facilities. In addition, many of these facilities will, in the future, be subject to land disposal restrictions (LDR) standards. As explained in the September 1, 1989 final rule and in the proposed LDRs for third scheduled wastes (54 FR 48372, 48492; November 22, 1989) EPA considers wastes that are brought under Subtitle C regulation by today's final rule to be "newly identified" wastes for purposes of establishing LDR standards under section 3004(g)(4) of RCRA. (54 FR 36624). Accordingly, EPA has proposed that newly identified mineral processing

⁶ Except persons who previously have notified EPA or an authorized state that they generate, transport, treat, store or dispose of hazardous waste and have received an identification number.

US EPA ARCHIVE DOCUMENT

wastes not be subject to the BDAT standards that the Agency proposed on November 22, 1989 for characteristic hazardous wastes. As required by RCRA section 3004(g)(4)(C), EPA plans to study the mineral processing wastes removed from the temporary exemption to determine BDAT for ones that exhibit one or more characteristic of a hazardous waste.

All existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of hazardous wastes covered by today's final rule, and that are currently operating pursuant to interim status under Section 3005(e) of RCRA, must file with EPA an amended Part A permit application within six months of today's publication (i.e., by July 23, 1990), in accordance with § 270.72(a).

Under current regulations, a hazardous waste management facility that has received a permit pursuant to Section 3005 may not treat, store, or dispose of the wastes removed from the temporary exclusion by today's final rule, if those wastes are characteristically hazardous under 40 CFR Part 261, Subpart C, when the final rule becomes effective (i.e., July 23, 1990) unless and until a permit modification allowing such activity has occurred in accordance with § 270.42. Consequently, owners and operators of such facilities will want to file any necessary modification applications with EPA before the effective date of today's final rule. EPA has recently amended its permit modification procedures for newly listed or identified wastes. (See 40 CFR 270.42(g).) For more details on the permit modification procedures, see 53 FR 37912, September 28, 1988.

2. Interim Status and Permit Modifications in Authorized States

Until the state is authorized to regulate the wastes that are being removed from temporary exclusion by today's final rule and that are hazardous under 40 CFR part 261, subpart C, no permit requirements apply. Facilities lacking a permit, therefore, need not seek interim status until state authorization is granted. Any facility treating, storing, or disposing of these wastes on the effective date of state authorization may qualify for interim status under applicable state law. Note that in order to be no less stringent than the Federal program, the state "in existence" date for determining interim status eligibility may not be later than the effective date of EPA's authorization of the state to regulate these wastes. These facilities must provide the state's equivalent of a part A permit

application as required by authorized state law.

Finally, RCRA section 3005(e) (interim status) or any authorized state analog apply to waste management facilities qualifying for state interim status. For those facilities managing wastes under an existing state RCRA permit, state permit modification procedures apply.

VI. Effect on State Authorizations

Because the requirements in today's final rule are not being imposed pursuant to the Hazardous and Solid Waste Amendments of 1984, they will not be effective in RCRA authorized states until the state program amendments are effective. Thus, the removal of the temporary exclusion will be applicable six months after today's publication (i.e., on July 23, 1990) only in those few states that do not have final authorization to operate their own hazardous waste programs in lieu of the Federal program. In authorized states, the reinterpretation of the regulation of non-excluded processing wastes will not be applicable until the state revises its program to adopt equivalent requirements under state law and receives authorization for these new requirements. (Of course, the requirements will be applicable as state law if the state law is effective prior to authorization).

Based on the scope of today's final rule, states that have final authorization (40 CFR 271.21(e)) must revise their programs to adopt equivalent standards regulating non-Bevill mineral processing wastes that exhibit hazardous characteristics as hazardous by July 1, 1991 if regulatory changes only are necessary, or by July 1, 1992 if statutory changes are necessary. These deadlines can be extended by up to six months (i.e., until January 1, 1992 and January 1, 1993, respectively) in exceptional cases (40 CFR 271.21(e)(3)). Once EPA approves the revision, the state requirements become RCRA Subtitle C requirements in that state. States are not authorized to regulate any wastes subject to today's final rule until EPA approves their regulations. Of course, states with existing standards that address these wastes may continue to administer and enforce their regulations as a matter of state law.

Currently unauthorized states that submit an official application for final authorization less than 12 months after the effective date of today's final rule (i.e., before January 23, 1991) may be approved without including an equivalent provision (i.e., to address non-Bevill mineral processing wastes) in the application. However, once authorized, a state must revise its

program to include an equivalent provision according to the requirements and deadlines provided at 40 CFR 271.21(e).

VII. Economic Impact Screening Analysis Pursuant to Executive Order 12291

Sections 2 and 3 of Executive Order 12291 (46 FR 13193) require that a regulatory agency determine whether a new regulation will be "major" and, if so, that a Regulatory Impact Analysis (RIA) be conducted. A major rule is defined as a regulation that is likely to result in one or more of the following impacts:

- (1) An annual effect on the economy of \$100 million or more;
- (2) A major increase in costs or prices for consumers, individuals, industries, Federal, State, and local government agencies, or geographic regions; or
- (3) Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Today's final rule completes the Agency's revised interpretation of the Bevill Mining Waste Exclusion for mineral processing wastes. The first part of this reinterpretation, dealing with the vast majority of individual mineral processing waste streams, was made final on September 1, 1989. The preamble to the September 1 rule presented the results of the Agency's economic impact screening analysis, covering scores of small volume mineral processing wastes, and examining cost impacts associated with 39 potentially hazardous low volume wastes in detail. This analysis indicated a total annual compliance cost for subtitle C waste management of about \$54 million. As indicated in section III of this preamble, today's final rule removes five additional processing wastes from the Bevill exclusion and subjects them to regulation under subtitle C of RCRA if they exhibit hazardous characteristics.

Consistent with Executive Order 12291, the Agency has completed a revised economic impact screening analysis for the five mineral processing wastes removed from the Bevill exclusion by today's rule. These revisions account for changes in the Bevill status of certain wastes since the September 25, 1989, NPRM and comments received on the original analysis. Results of this revised analysis suggest that three of the five waste streams are likely to exhibit hazardous characteristics at some or all of the

US EPA ARCHIVE DOCUMENT

facilities that generate them. One additional waste stream (air pollution control solids from lightweight aggregate production) may be regulated at some facilities under the subtitle C "derived-from" rule. As a consequence, as many as eleven mineral processing facilities in four different commodity sectors may incur compliance costs due to this rule. The Agency estimates that total annual compliance costs are not likely to exceed \$18.5 million and therefore concludes that today's final rule is not a "major rule" according to the first criterion of E.O. 12291.⁷

With respect to the other E.O. 12291 criteria, the Agency does not predict a substantial increase in costs or prices for consumers or a significant effect on international trade or employment in connection with today's final rule. Some individual mineral processing facilities in the lightweight aggregate and titanium dioxide sectors may experience significant compliance costs which could affect their ability to compete in their respective commodity sectors. On balance, however, the Agency concludes that today's rule does not constitute a major rule as defined by E.O. 12291. The following paragraphs of this section briefly restate the Agency's economic impact screening approach and assumptions, and provide revised results.

Approach

Methodology and Assumptions

The revised screening analysis prepared for today's final rule used essentially the same methodology employed for and described in the September 25, 1989, NPRM (54 FR 39312-1) and accompanying background documents, to which the reader is referred for details. Substantial differences between the scope and results of the analysis described in the proposed rule and those reported here primarily reflect a shift in the Bevill status of several key waste streams based on new information on waste generation rates and chemical characteristics, as described above in section III. Specifically, the final rule restores the Bevill status for two wastes for which the Agency has previously estimated compliance cost impacts in the September 25 NPRM (roast leach ore residue from chromite processing and process wastewater from hydrofluoric

acid production), thus obviating the predicted impacts for these two sectors.

On the other hand, APC dust/sludge from lightweight aggregate production (proposed for retention within the exclusion based upon preliminary review of EPA survey data) has now been removed from the Bevill exclusion following a closer examination of the data, which indicates that average scrubber solid volumes are well below the high volume criterion.

Because EPA waste sampling data and information submitted both in response to the Agency's RCRA section 3007 letter and in public comment indicate that APC solids from lightweight aggregate are unlikely to exhibit hazardous waste characteristics, the Agency believes that removing this material from the Bevill exclusion will not impose any cost or economic impacts on most of the 30 or so facilities that generate it. Nonetheless, it is well known that several lightweight aggregate production facilities currently burn listed hazardous wastes as a primary fuel and would hence experience subtitle C regulatory compliance costs as a consequence of the "derived-from" rule (see 40 CFR 261.3(b)(2)(i)).

EPA has not substantially modified its estimates of the distribution and magnitude of the costs or impacts for the remaining four affected waste streams whose status remained unchanged from the September 25 NPRM (elemental phosphorus off-gas solids, primary lead process wastewater, titanium dioxide sulfate process waste acids, and titanium dioxide sulfate process waste solids).

Of the five waste streams reviewed for potential hazard characteristics, the preliminary screening assessment suggests that two—lightweight aggregate APC scrubber solids and sulfate process waste solids from titanium dioxide production—are not likely to exhibit hazardous characteristics under current RCRA hazardous waste test procedures. Therefore, EPA has assumed in its economic impact screening analysis that facilities generating these wastes will experience no compliance cost impacts associated with potential subtitle C regulation of these wastes. The primary exception relates to five (out of 30) lightweight aggregate producers that currently burn listed hazardous wastes as fuel. EPA's information indicates that five facilities operated by the Solite Corporation and one facility operated by the Norlite Corporation burn hazardous waste as fuel; one of the Solite facilities apparently does not

generate any solid wastes. With few specific exceptions (based on waste sampling data), the remaining three waste streams were considered hazardous at all facilities, for the characteristics specified, as follows:

- Elemental phosphorus off-gas solids (from wet collection)—EP toxic for cadmium
- Primary lead process wastewater—EP toxic for arsenic, cadmium, and lead, corrosive
- Titanium dioxide sulfate process waste acids—EP toxic for chromium, corrosive

Fourteen facilities in these four affected commodity sectors, were then further analyzed on a site-specific basis in terms of current (baseline) management practices in order to determine consistency with current subtitle C management requirements and to select reasonable site-specific compliance options as a basis for estimating costs.

EPA determined that one of the 14 facilities analyzed on the basis of company-provided data is currently managing hazardous wastes in compliance with current subtitle C requirements, and thus may not incur additional costs when today's rule becomes effective. The data supporting this finding were obtained from responses to EPA's 1987-88 National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (TSDR Survey).⁸ For some other individual facilities, data from the National Survey of Solid Wastes from Mineral Processing Facilities document that current practice for several of the wastes (particularly the wastewaters) removed by today's rule includes treatment in a wastewater treatment plant, direct discharge via NPDES permit provisions, and/or recycling to the process generating the waste in question. EPA has reviewed this information, and used it to develop baseline and subtitle C compliance scenarios for this analysis. As a result, estimated compliance costs at several of the facilities affected by today's final rule are zero. That is, removal of the waste from Bevill will impose no operational or economic impacts because these facilities already appear to employ management practices consistent with subtitle C requirements.

2. Costing Assumptions for Lightweight Aggregate APC Scrubber Solids

As discussed above, five facilities producing lightweight aggregate air

⁷ The Preamble to the September 25, 1989, proposed rule presented an annual compliance cost estimate of \$5.2 million for 9 affected facilities in 5 commodity sectors. The net increase to \$18.5 million attributable entirely to the addition of lightweight aggregate APC scrubber solids to the list of affected sites.

⁸ USEPA. 1989. *Development of the High Volume Criterion for Mineral Processing Wastes*. Special Wastes Branch, Office of Solid Waste. August 18, 1989.

US EPA ARCHIVE DOCUMENT

pollution control (APC) scrubber solids will face economic impacts due to the removal of this waste stream from the Bevill exclusion by today's final rule, because they burn listed hazardous waste as fuel. Because this sector was not evaluated in the original screening analysis for the NPRM, the following paragraphs present the Agency's costing approach and engineering design assumptions for evaluating compliance options and estimating costs.

In general, there are a multitude of possible compliance options available to lightweight aggregate producers, varying from conversion to fossil fuels to various possible waste reduction methods to possible delisting petition options. Because of lack of data necessary to perform quantitative cost estimates for most of these alternatives (as well as time constraints on this final court-ordered rule), the Agency's screening analysis has been forced to focus only on the extremely high-cost option of managing the APC scrubber solids (generated as wet sludges) as Subtitle C hazardous wastes. The Agency's cost estimates are thus based on the difference in disposal costs between managing the reported sludge volumes in unlined impoundments or waste piles versus disposal in a permitted subtitle C landfill. For these and other reasons outlined below, the Agency's cost estimates for this sector should be regarded as upper-bound estimates.

The waste quantities potentially subject to subtitle C landfill disposal have been estimated using responses to the industry survey and, in one case, written public comments. Methods for developing these estimates are described in a supplemental technical background document that may be found in the docket for today's rule.⁹ The Agency has assumed that the waste quantities reported by the facilities represent relatively dry material, and that dewatering would not be feasible as a volume reduction method prior to land disposal. If dewatering would be possible, then the quantity of waste for subtitle C landfill disposal has been overestimated and, to this extent, EPA has, accordingly overestimated compliance costs, which are directly related to the mass of waste that must be disposed.

The Agency has also conservatively assumed that all lightweight aggregate kilns at each affected facility (most

facilities operate three to five kilns) do and will continue to burn listed hazardous wastes as fuel. Consequently, in this analysis the entire scrubber solids stream for all facilities is assumed to be affected by the derived-from rule and therefore subject to subtitle C. To the extent that some or all facilities do not burn listed hazardous wastes in all of their kilns and/or do (or could) segregate listed and non-listed (characteristic) hazardous wastes prior to their use as fuel, EPA has further overestimated costs and impacts.

In addition, the Agency has some concerns about the waste volume data reported by one of the two affected firms, the Solite Corporation. Solite's facilities report waste generation rates that are substantially higher than any other lightweight aggregate producer, even when corrected for differences in plant size and production rate. The waste-to-product ratio calculated by EPA for Solite's facilities ranges from 15 percent to more than 25 percent. This is from two and one half to 250 times the ratio calculated for the other reporting facilities generating the same waste. Nonetheless, the data reported in the National Survey and used in this analysis are consistent with information previously submitted to EPA by the company. This may or may not be related to the issue of moisture content discussed above. It should be noted, however, that these very high reported waste generation rates lead directly to significant compliance cost estimates. If actual waste generation rates are lower, actual compliance costs and associated impacts will be less than those predicted here.

Another conservative assumption that the Agency has made in conducting this analysis is that affected firms would continue using current air pollution control methods and, therefore, continue to generate wet APC scrubber solids. Nearly one half of the lightweight aggregate industry currently uses dry collection methods, including one of the facilities operated by Solite that burns hazardous waste fuel. Waste generation rates using dry collection methods are generally significantly lower than those using wet collection methods. In addition, information submitted to EPA indicates that at some facilities, the APC dust is recycled into the lightweight aggregate kilns from which it is generated, such that the process does not generate any substantial quantity of solid wastes. To the extent that the facilities examined in this analysis could install dry dust collection systems and recycle the solids rather than continue to use wet collection systems, costs and

related impacts could be reduced *even if* the facilities continued to utilize listed hazardous wastes as fuel supplements.

Finally, the affected firms, Solite and Norlite, could potentially avoid subtitle C regulation altogether by either (1) converting entirely to other fuels and discontinuing use of listed hazardous wastes as fuel, or (2) having their waste streams de-listed on a site-specific basis. EPA notes here that Solite has indicated in its public comments on the September 25, 1989, and previous proposed rules that it would not continue to accept and burn hazardous waste fuels if the Bevill exemption were to be removed from its wastes. While the Agency recognizes that this course of action is a distinct possibility and perhaps the least cost compliance alternative, the Agency was not able in the present screening analysis to evaluate the available fuel conversion option due to a lack of factual information about such factors as retrofitting costs, thermal value of currently used hazardous waste fuels, and the revenues accruing to the two firms for accepting the hazardous wastes from individual generators. For the same reasons, i.e., insufficient data, it has also not been possible to predict the outcome of any attempt by the firms to have the APC scrubber wastes in question officially delisted (withdrawn from subtitle C regulation) by the Agency.

Similarly, while EPA acknowledges that intermediate alternatives may be available, such as burning only characteristic rather than listed hazardous wastes in at least some kilns, currently available information is insufficient to assess the feasibility or cost implications of this type of operational change.

Consequently, EPA's compliance cost analysis has been conducted using the best currently available information to develop what are essentially worst-case compliance cost estimates for the lightweight aggregate commodity sector. To the extent that the affected facilities can (1) avoid subtitle C regulation by fuel changes and/or equipment modifications or successful delisting petitions, or (2) employ waste-reduction techniques to generate lesser quantities of APC scrubber solids subject to the derived-from rule, the costs and impacts reported here may represent a substantial overestimate.

B. Aggregate and Sector Compliance Costs

The impact screening analysis projects that eleven facilities in four different mineral processing commodity

⁹ Addendum to the Technical Background Document: Development of the Cost and Economic Impacts of Implementing the Bevill Mineral Processing Wastes Criteria. Economic Analysis Staff, Office of Solid Waste, USEPA, January 12, 1990.

sectors will be affected directly by today's final rule. Thirty-five facilities in these four sectors are expected to be unaffected by today's rule because they either (1) do not generate the processing waste in question, (2) routinely recycle the material as a process input, or (3) produce a waste that apparently does not fail standard EPA hazardous waste test criteria. Another three facilities, one in the titanium dioxide sector, and two in the lead sector, are believed to be unaffected by virtue of already incorporating subtitle C (or equivalent NPDES wastewater treatment) practices in their current waste management systems. In aggregate, the total impact of today's rule is estimated to be about 18.5 million per year. EPA cost estimates for individual commodity sectors and facilities are presented in table 4.

For the reasons discussed above, the major part of the total estimated compliance costs (86 percent) falls upon the five lightweight aggregate facilities currently burning listed hazardous wastes as fuel. Cost impacts range from 2.5 million annually for the Norlite and Florida Solite facilities to almost \$4.6 million annually for Solite's Arvonnia, Virginia, facility. The reasons for the large magnitude of these compliance cost estimates are the host of conservative analytical assumptions articulated above, together with the relatively large quantities of scrubber wastes reported by the Solite company. One other sector, titanium dioxide, is expected to experience aggregate sector

impacts of about \$1.8 million annually. Within this sector, all of the cost impacts are predicted to fall on one of the two facilities, with the other producer's waste management costs being unaffected by removal from the Bevill exclusion. Three of five primary lead facilities are projected to incur costs. Two primary lead producers, Asarco and Doe Run, are expected to experience annual compliance costs of \$41,000 and \$235,000, respectively, with estimated costs for their individual primary lead facilities ranging from zero to \$201,000 annually, depending on current management practices and plant-specific waste characteristics.

The two (of five) elemental phosphorus plants that are expected to experience impacts have total estimated incremental costs of \$179,000 annually, with the vast majority (\$173,000) imposed on the facility owned by Occidental Chemical Corporation.

In response to public comments on the analysis presented in the September 25 proposal, EPA wishes to clarify certain aspects of these cost estimates as they relate to land disposal restrictions and corrective action. The Agency did not explicitly address the potential impact of prospective land disposal restrictions in the present economic impact screening analysis. The Agency did, however, develop its compliance cost estimates based on environmentally sound management practices for subtitle C waste disposal. For example, for EP toxic liquid waste streams, the Agency included a solidification and

stabilization step in the waste treatment sequence, which would allow any treatment residual (e.g., EP toxic sludge) to be disposed in a subtitle C landfill. While this engineering compliance construct does not necessarily represent a precise BDAT under the LDRs for the wastes in question (because LDRs for characteristic wastes have not been promulgated, nor has BDAT been defined), EPA believes that it is a reasonable and realistic means of characterizing environmentally protective waste management under subtitle C, and captures the essence of what would be required of facility operators when LDRs for these wastes go into effect.

With respect to corrective action, EPA did not consider the effect of corrective action requirements on potential costs and impacts associated with today's rule. Many of the facilities potentially affected by today's are likely to avoid being drawn into the subtitle C system as a treatment, storage, or disposal (TSD) facility and hence avoid becoming subject to corrective action requirements. To the extent that a facility must become permitted, facility-wide corrective action would apply. In the case of the one facility that is already a permitted TSD, today's rule has no incremental impact, because it is already subject to corrective action requirements. Therefore, the Agency believes that the practical consequences of not addressing corrective action requirements in the present screening analysis may not be substantial.

TABLE 4.—SUMMARY OF PRODUCTION, VALUE OF SHIPMENTS, AND COMPLIANCE COSTS

Commodity sector ¹	Number of plants producing commodity	Production ² (MT/YR)	Unit value ³ (\$/MT)	Value of shipments (\$/YR)	Compliance costs (\$/YR)	Costs per metric ton of product ⁴ (\$/MT)	Costs/value of shipments ⁵ (percent)
Elemental Phosphorus							
Entire Sector.....	5	341,950	1688	577,266,155	179,000	0.5	<0.1
Facilities Evaluated.....	2	174,150	1688	293,992,312	179,000	1.0	0.1
FMC—Pocatello ID.....		122,449	1688	208,713,345	6,000	<0.1	<0.1
Occidental—Columbia TN.....		51,701	1688	87,278,968	173,000	3.3	0.2
Lead							
Entire Sector.....	5	374,633	724	271,162,781	276,000	0.7	0.1
Facilities Evaluated.....	5	374,633	724	271,162,781	276,000	0.7	0.1
Asarco—East Helena MT ⁶		52,189	724	37,775,036	41,000	0.8	0.1
Asarco—Glover MO ⁶		52,189	724	37,775,036	0	0.0	0.0
Asarco—Omaha NE ⁶		52,189	724	37,775,036	0	0.0	0.0
Doe Run—Buick MO.....		92,762	724	67,141,706	34,000	0.4	0.1
Doe Run—Herculeaneum MO.....		125,304	724	90,695,969	201,000	1.6	0.2
Lightweight Aggregate							
Entire Sector ⁶	30	4,140,642	27.5	113,973,910	16,206,000	3.9	14.2
Facilities Evaluated.....	5	911,458	27.5	25,088,493	16,206,000	17.8	64.6
Carolina Solite—Norwood NC ⁶		220,454	27.5	6,068,143	3,610,000	16.4	59.5
Florida Solite—Green Cove FL ⁶		112,491	27.5	3,098,390	2,516,000	22.4	81.3
Kentucky Solite—Brooks KY ⁶		175,088	27.5	4,819,414	2,997,000	17.1	62.2
Virginia Solite—Arvonnia VA ⁷		221,988	27.5	6,110,373	4,553,000	20.5	74.5
Norlite—Cohoes NY ⁶		181,437	27.5	4,994,174	2,528,000	13.9	50.8
Titanium Dioxide							
Entire Sector.....	9	893,878	1891	1,690,462,634	1,817,000	2.0	0.1
Facilities Evaluated.....	2	114,286	1891	216,134,766	1,817,000	15.9	0.8
Kemira Oy—Savannah GA ⁸		54,422	1891	102,921,317	0	0.0	0.0
SCM—Baltimore MD ⁸		59,864	1891	113,213,449	1,817,000	30.4	1.6

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TABLE 4.—SUMMARY OF PRODUCTION, VALUE OF SHIPMENTS, AND COMPLIANCE COSTS—Continued

Commodity sector ¹	Number of plants producing commodity	Production ² (MT/YR)	Unit value ³ (\$/MT)	Value of shipments (\$/YR)	Compliance costs (\$/YR)	Costs per metric ton of product ³ (\$/MT)	Costs/value of shipments ³ (percent)
Combined total—all four sectors							
All Facilities.....	49	5,751,103	461	2,652,885,481	18,478,000	3.2	0.7
Affected Facilities Only ⁴	11	1,415,726	444	627,906,964	18,478,000	13.1	2.9

¹ Facilities evaluated are those believed to generate wastes that may exhibit hazardous characteristics or be hazardous by virtue of the derived-from rule.
² 100 percent capacity utilization is assumed, except as noted.
³ Totals for unit value, costs per metric ton of product, and costs/value of shipments are calculated and not the sum of the individual facility values.
⁴ Capacity and production values apportioned equally among the three Asarco facilities.
⁵ Production figure source: Minerals Yearbook, 1987, p. 258.
⁶ Production figure as reported by the facility in response to the 1989 National Survey of Solid Wastes from Mineral Processing.
⁷ Production figure calculated from firm-wide waste-to-product ratio and reported waste generation rate provided in 11/88 public comments.
⁸ Sulfate process only.
⁹ Affected facilities are the facilities evaluated having non-zero compliance costs.

C. Economic Impacts

EPA's screening-level analysis of economic impact compared the magnitude of annual compliance costs for each affected facility to the estimated value of shipments. This ratio provides a first approximation of the extent to which the profitability of firms, or, alternatively, commodity prices, or other measures of national impact may be adversely affected by the imposition of regulatory compliance costs.

Sectors or facilities with ratios above one percent were considered vulnerable to moderate to significant financial impacts and were evaluated in more detail in terms of market and industry factors that might affect the ultimate incidence and impact of the costs.

As seen in Table 4, despite the fact that only a small percentage of facilities in the lightweight aggregate sector would be affected (five of thirty), the magnitude of the estimated incremental waste management cost is sufficient to indicate potentially significant sector-wide impacts, particularly at the regional level. Upper bound compliance cost ratios at the level of the individual affected facilities are extreme, ranging from 51 percent to 81 percent of value of shipments.

For the other sectors, only one facility (in the titanium dioxide (sulfate) sector) is predicted to experience impacts somewhat one percent level, at about 1.5 percent. This level of impact is regarded as moderate. The two elemental phosphorus (FMC and Occidental), and primary lead (Asarco and Doe Run) producers examined in this study are expected to experience relatively minor long-term economic impacts. Obviously, firms and facilities already in compliance and with compliance costs of zero (i.e., Kemira and Asarco) will not experience any negative economic impacts associated with this rule.

1. Facility and Sector Impacts

To further explore the economic impact of today's final rule, EPA has examined some of the factors that influence the ability of affected firms to pass through prospective compliance costs to product consumers in the form of higher prices. These factors include absolute price levels, major end uses of the mineral commodity, competition from imports and substitutes, secondary production, and flexibility in other production cost factors.

a. *Lightweight Aggregate.* Lightweight aggregate has three major uses, which generally reflect its superior performance capabilities as a construction material. The three main applications are in concrete block (61 percent of total consumption), highway resurfacing (19 percent), and structural concrete (18 percent).¹⁰ A fourth, though small use (about 2 percent), involves new applications in recreational and horticultural materials.¹¹

Most lightweight aggregate produced in the U.S. is used in manufacturing concrete block. Lightweight aggregate is valued as a high-strength aggregate for concrete forms, because it allows a significant weight savings over heavier aggregates. The weight savings permit structures to be designed at an overall lower cost.¹² Concrete block fabricated from lightweight aggregate also has better insulating properties than block using denser substitutes.

Lightweight aggregate's second major use is in road surfacing, where it is used as an ingredient in asphalt surfaces. It offers superior skid-resistance compared to other bulk fillers.¹³ Lightweight

aggregate's third major application is as a component of structural concrete, such as in bridge surfaces and floors in high-rise buildings, where its low weight and high strength are useful.¹⁴

Lightweight aggregate is valued in its main applications because of its weight savings and performance features (skid resistance, insulating abilities, and strength), though substitutes can compete in cases where users do not have stringent requirements for these qualities and are willing to use one of the available substitutes. Competition within lightweight aggregate's primary applications comes from other building materials, with the main substitute being heavy-weight stone (aggregate). Other substitutes include light natural aggregates (pumice or cinders) and foam.¹⁵

Markets for lightweight aggregate are basically regional or local rather than national. The widespread availability of domestic clays suitable for lightweight aggregate production, the high cost of transportation for aggregates, and the relatively low market value (price) of this commodity limit the size of market areas. As a result, firms in the industry, which are widely scattered across the U.S., are limited in their ability to expand their sales into competitors' territories without actually constructing new plants.

International trade in the lightweight aggregate sector is extremely limited. As shown in Table 5, the United States is a significant net exporter of clays as a general category. Trade data for finished lightweight aggregate are not available, though a trade source indicates that imports have not affected lightweight aggregate's market to a large degree, other than some recent imports of pumice from the Mediterranean area.¹⁶

¹⁰ Bureau of Mines, *Minerals Yearbook 1987*, "Clays," Page 254.

¹¹ *Ibid.*

¹² *The Building Estimator's Reference Book*, F.R. Walker Publishers: Lisle, IL, 1989, Page 3.158.

¹³ Ampan, Sarkis G. "Clays," in *Mineral Facts and Problems*, U.S. Bureau of Mines, 1987, Page 165.

¹⁴ *Ibid.*, page 165.

¹⁵ J. Ries, Expanded Clay and Shale Institute, Personal communication, December 29, 1989.

¹⁶ *Ibid.*

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Energy costs are an important component of production costs for the lightweight aggregate industry: Kilns are reported to require 2.0 to 6.1 million BTUs of fuel per MT of lightweight aggregate produced.¹⁷ Residual oil (the fuel used in most kilns) costs approximately \$2.39 per million BTUs in 1988.¹⁸ Assuming this fuel cost, the cost of fuel per MT lightweight aggregate is at least \$4.80, and could possibly be as high as \$14.60 (though the higher fuel consumption rate might apply at plants configured to use less expensive fuels).

It is therefore apparent that energy costs account for a substantial portion of the margin between the raw material cost of clay (\$10 per MT) and the price of finished lightweight aggregate (as low as \$24 per MT). Consequently, facilities that can achieve fuel cost savings by using hazardous wastes as fuel supplements are likely to have a substantial current cost advantage over facilities relying solely upon other fuels, such as oil or coal, especially since they can generally charge a disposal fee to waste generators. Compliance costs associated with today's rule would reduce this cost advantage, though if a facility elected to continue using listed hazardous wastes its total production costs would rise above industry norms only to the extent that the incremental compliance costs exceeded the fuel cost savings that it currently enjoys. Alternatively, if the facility elected to stop using the listed hazardous wastes, it would (after any necessary retrofitting) have fuel costs comparable to the majority of other facilities in the industry.

In summary and for several reasons, EPA believes that the lightweight aggregate producers affected by today's rule will not suffer the calamitous economic impacts that might be

suggested by the Agency's incremental cost estimates, even if one assumes that these upper limit cost impacts will actually be incurred. First, facilities that currently burn hazardous waste as fuel enjoy a potentially significant cost advantage with respect to their competitors. This advantage may mitigate, perhaps to a considerable extent, the cost impacts of today's rule. In addition, because of the special physical characteristics offered by lightweight aggregate in comparison with conventional aggregates, affected producers may have some ability to pass through compliance costs to local industrial and public sector markets in the form of higher prices, though to an uncertain extent. Finally, high transportation costs and a widely dispersed domestic industry suggest that moderate price increases could be sustained, at least for lightweight aggregate applications that require the low density and high strength offered by this material.

b. Titanium Dioxide. Titanium dioxide is used in pigments for paints and surface coatings, paper manufacturing, and plastics. Half of titanium dioxide production is consumed in pigments, where its competitive position is strong. Demand for high-quality paper also favors titanium dioxide.

The domestic industry supplies most of the titanium dioxide used in the U.S., with imports exceeding exports by only a moderate degree. As a result, titanium dioxide is in a relatively strong domestic market position. Producers using the sulfate process, however, are in a minority and account for only one eighth of domestic production. It is not likely that the one affected producer could establish a premium for its product and would therefore be limited in the extent to which it could recover cost increases.

2. Effects on Consumer Prices

For several reasons, EPA believes that

this rule will not create any appreciable changes in consumer prices. The first and principal reason is the generally low overall percentage of compliance costs to product value, which does not exceed one percent for any affected commodity except lightweight aggregate. Combined with this is the fact that not all producers in these sectors are affected equally (many domestic competitors are not affected at all) and that other domestic or foreign competitors could fill production shortfalls, either with identical or substitutable products. Finally, since all the affected commodities are primary intermediate raw material inputs to the production of other finished products, their relative contribution to final consumer goods prices is, in any case, typically quite small.

3. Foreign Trade Impacts

Trade is substantial in many of the mineral commodities covered by today's rule, but is probably only likely to be a factor with respect to titanium dioxide. Basic import and export data for the sectors that generate potentially hazardous wastes are presented in Table 5. Import and export figures for lightweight aggregate (expanded shale) are not available, although international trade is not thought to be a significant factor for this sector. Because imports of titanium dioxide are significant, the ability of the affected domestic producer to raise prices to recover compliance costs, is, as discussed above, further limited, and there may be a modest stimulus towards import expansion.

In view of the above, it is unlikely that the overall trade balance in the domestic minerals industry will be significantly affected by today's rule, though in one sector regulatory cost impacts may increase already positive net imports to a small degree.

TABLE 5.—IMPORTS AND EXPORTS OF MINERALS, 1987

Commodity sector	Commodity forms(s)	Domestic production		Imports		Exports	
		Quantity (MT)	Value (\$000)	Quantity (MT)	Value (\$000)	Quantity (MT)	Value (\$000)
Elemental Phosphorus		341,950	577,266	4,483	6,609	20,302	30,796
Lead	Pigs and bars (content) ¹	374,633	271,163	185,673	123,157	10,116	11,945
Lightweight Aggregate	Clays (all types) ²	³ 4,140,642	³ 113,974	34,191	9,392	3,023,593	512,964
Titanium Dioxide	Titanium Dioxide Pigments (content)	893,678	1,690,483	162,739	236,945	99,731	181,707

Source: Bureau of Mines. Minerals Yearbook 1987. pp. 61, 64, 221, 223, 258, 280, 262, 377, 684, 889, 893, and 894.

¹ Exports include cathodes and sheets.

² Import/export data for lightweight aggregate are unavailable.

³ Data reflect lightweight aggregate production only.

US EPA ARCHIVE DOCUMENT

VIII. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA) of 1980 (Pub. L. 96-354), which amends the Administrative Procedures Act, requires Federal regulatory agencies to consider "small entities" throughout the regulatory process. The RFA requires, in section 603, an initial screening analysis to be performed to determine whether a substantial number of small entities will be significantly affected by a regulation. If so, regulatory alternatives that eliminate or mitigate the impacts must be considered.

In the preamble to the September 25 proposed rule, the Agency presented documentation of and the rules from a screening analysis to determine the potential for significant small business impacts imposed by the proposed reinterpretation of the Mining Waste Exclusion (see 54 FR 39316-7). At that time it was determined that no small business enterprises would be adversely affected by the rule, as proposed.

The changes that have occurred in today's final rule, as distinct from the September 25, 1989, proposal, have served to reduce the number of potentially affected sectors while increasing slightly the number of potentially affected facilities. Based upon the revised cost and economic impact analysis presented above, and further data collection and analysis by the Agency, EPA has concluded that only one small business enterprise, Norlite Corporation, with approximately 75 employees,¹⁹ might be adversely affected by today's final rule. Therefore, EPA concludes that, just as in the September 25 proposal, there will not be a significant adverse impact on a substantial number of small mineral processing companies, because among the affected sectors there is only one small business that is expected to experience impacts from today's final rule.

X. List of Subjects in 40 CFR 260, 261 and 262

Designated facility, Hazardous waste, Waste treatment and disposal, Recycling, Reporting and recordkeeping requirements, Manifests.

Dated: January 12, 1990.
 William K. Reilly,
 Administrator.

For the reasons set out in the preamble, parts 260, 261 and 262 of title

40 of the Code of Federal Regulations is amended as follows:

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

1. The authority citation for Part 260 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974.

2. Section 260.10 is amended by revising the definition "designated facility" to read as follows:

§ 260.10 Definitions.

* * * * *

"Designated facility" means a hazardous waste treatment, storage, or disposal facility which (1) has received a permit (or interim status) in accordance with the requirements of parts 270 and 124 of this chapter, (2) has received a permit (or interim status) from a State authorized in accordance with part 271 of this chapter, or (3) is regulated under § 261.6(c)(2) or subpart F of part 266 of this chapter, and (4) that has been designated on the manifest by the generator pursuant to § 260.20. If a waste is destined to a facility in an authorized State which has not yet obtained authorization to regulate that particular waste as hazardous, then the designated facility must be a facility allowed by the receiving State to accept such waste.

* * * * *

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTES

3. The authority citation for Part 261 continues to read as follows:

Authority: 42 U.S.C. 6095, 6912(a), 6921, and 6922.

4. Section 261.4 is amended by revising paragraph (b)(7), to read as follows:

§ 261.4 Exclusions.

* * * * *

(b) * * *

(7) Solid waste from the extraction, beneficiation, and processing of ores and minerals (including coal), including phosphate rock and overburden from the mining of uranium ore. For purposes of § 261.4(b)(7), beneficiation of ores and minerals is restricted to the following activities: 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; flotation; ion exchange; solvent extraction; electrowinning; precipitation; amalgamation; and heap, dump, vat, tank, and *in situ* leaching. For the purposes of § 261.4(b)(7), solid waste from the processing of ores and minerals will include only the following wastes, until EPA completes a report to Congress and a regulatory determination on their ultimate regulatory status:

- (i) Slag from primary copper processing;
 - (ii) Slag from primary lead processing;
 - (iii) Red and brown muds from bauxite refining;
 - (iv) Phosphogypsum from phosphoric acid production;
 - (v) Slag from elemental phosphorus production;
 - (vi) Gasifier ash from coal gasification;
 - (vii) Process wastewater from coal gasification;
 - (viii) Calcium sulfate wastewater treatment plant sludge from primary copper processing;
 - (ix) Slag tailings from primary copper processing;
 - (x) Fluorogypsum from hydrofluoric acid production;
 - (xi) Process wastewater from hydrofluoric acid production;
 - (xii) Air pollution control dust/sludge from iron blast furnaces;
 - (xiii) Iron blast furnace slag;
 - (xiv) Treated residue from roasting/leaching of chrome ore;
 - (xv) Process wastewater from primary magnesium processing by the anhydrous process;
 - (xvi) Process wastewater from phosphoric acid production;
 - (xvii) Basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production;
 - (xviii) Basic oxygen furnace and open hearth furnace slag from carbon steel production;
 - (xix) Chloride process waste solids from titanium tetrachloride production;
 - (xx) Slag from primary zinc processing.
- * * * * *

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PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

5. The authority citation for Part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922, 6923, 6924, 6925, and 6937.

6. Section 262.23 is amended by adding paragraph (e) to read as follows:

§ 262.23 Use of the manifest.

* * * * *

(e) For shipments of hazardous waste to a designated facility in an authorized State which has not yet obtained authorization to regulate that particular

waste as hazardous, the generator must assure that the designated facility agrees to sign and return the manifest to the generator, and that any out-of-state transporter signs and forwards the manifest to the designated facility.

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