RESPONSE TO COMMENTS DOCUMENT

Land Disposal Restrictions--Phase IV: Final Rule Promulgating Treatment Standards for Metal Wastes and Mineral Processing Wastes; Mineral Processing Secondary Materials and Bevill Exclusion Issues; Treatment Standards for Hazardous Soils; and Exclusion of Recycled Wood Preserving Wastewaters

Volume 11
Comments Related to Newly-Identified Mineral Processing Waste Treatment Standards, Grab Versus Composite Sampling, Radioactive Mixed TC-Metal Wastes, and Sulfide Waste Issues

U.S. Environmental Protection Agency
Office of Solid Waste
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Washington, D.C. 20460

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List of Phase IV Land Disposal Restriction Codes, Description, and Location by Page Number

Index of Commenters and Location of Comment, By Issue

DCN PH4P048
COMMENTER Chemical Waste Management
RESPONDER AC
SUBJECT GRAB
SUBJNUM 048

COMMENT

With regard to the grab vs. composite sampling issue CWM believes that the Agency needs to reevaluate its position that wastewaters require composite and nonwastewaters require grab samples. Especially in light of the Agency's preamble discussion (See 60 Fed. Reg. at 43,683) which states:

"While UTS nonwastewater limits for metals specify a grab sample, the data used to develop standards included both grab and composite samples."

The fact that UTS levels were not all established using grab indicates that the Agency recognizes that composite samples for nonwastewaters can be appropriate. CWM commented on the use of grab versus composite samples during the Third Third rulemaking. CWM's position on this issue has not changed and is presented below.

CWM believes that in contrast to grab sampling, composite sampling is useful when the cost of analyzing multiple grab samples is prohibitive if the waste is reasonably homogeneous. The composite sample will represent the average concentration of the potential grab samples. It is important to note that the total amount of a constituent present in the composite sample is exult or greater than any single potential grab sample making up the composite; hence, the constituent may be more easily detected.

From a statistical perspective, when the number of potential observations is limited, composite sampling is clearly the method of choice for providing a "representative" index of a constituent level. It can also be easily shown that when compared to a treatment standard, a single composite sample will minimize both false positive and false negative rates relative to a single sample.

To illustrate this point, CWM conducted the following simulation study during development of comments for the Third Third. First,

ten background samples were drawn from a 109 normal distribution that was generated by taking the antilogy of data drawn from a normal distribution with mean zero and variance one. Second, a treatment standard was then generated using the EPA method, i.e., EXP [Y + 2.33 Sy], where Y is the exact mean of the natural log transformed values and Sy is the corresponding standard deviation. Third, from the same distribution, a new"grab sample" was selected and if this value now exceeded the limit a failure was recorded. Fourth, from the same distribution, four new samples were selected and then arranged to form a single composite sample, and if this composite sample exceeded the first, a failure was recorded. Fifth, steps 1-4 were then repeated 10,000 times, and the percent of failures for each of the two methods represent their false positive rates. Inspection of figure 1 reveals that for a difference of zero SD units, the composite sample attains the intended 1% false positive rates, but for the grab sample approach, the false positive rate is on the order of 4% (i.e., 96 out of 100 measurements incompliance due to change alone). Sixth, steps 1-5 were then repeated for differences of .2, .4, .6,..., 4.8, 5.0 SD units between the data used to construct the treatment standard and the simulated waste stream test data. In this way, we can compare grab samples and composite samples in terms of false negative rate as well. Inspection of figure 2 reveals that, in order to achieve a 5% false negative rate, the mean construct level must be 4.2 SD units above the mean of the data used to construct the treatment standard if we use grab samples, but only 3.4 SD units if we use a composite sample. Recall that in all of these cases, grab samples were used to construct the treatment standard; therefore, this simulation directly reflects the actual case that exists in the BDAT treatment standard problem.

The results of the simulation reveals that by using composite samples, not only do we achieve the intended false positive rate (i.e., 99 out of 100 measurements are now in compliance due to change alone), but we also produce a test with a substantially lower false negative rate. Clearly, the use of composite samples is justified here, and if anything, it should be required.
There is a reasonably straightforward explanation for these results. The variability of an individual grab sample is $\sigma 2$; however, the variability of a composite at 4 samples, has variability of $\sigma 2$ or a standard deviation of $\sigma 2$. This result indicates that the composite samples will have one half of the variability of the individual grab sample. By removing both high

and low outlying values, the false positive rate is clearly minimized, and a far more consistent result is obtained when contamination is actually present; therefore, the false negative rate is also minimized. If decisions are to be made based on the result of a single analysis, composite sampling is clearly the method of choice, regardless of whether the treatment standards were derived from grab or composite samples.

As a final note, it is interesting (but not surprising) that when composite samples are used, the elevated false positive rate of the EPA treatment standard disappears. The reason for this again stems from the difference between the distribution of an individual value and the mean at four values. To the extent that a waste stream is reasonably well mixed, the composite sample reflects the average orate sample value.

Since the distribution of average value is narrower than that of individual values, the same limit value (i.e., treatment standard) will provide increased coverage of the distribution. This is the reason why 96 of 100 grab samples will be in compliance but 99 out of 100 composite samples will be in compliance for a well designed and properly operated facility.

As such, CWM encourages the Agency to allow use of both sampling methods for nonwastewaters, and that for enforcement purposes the Agency utilize the same method employed by the generator or TSDF, or totally shift its reliance from grab samples to composite samples.

RESPONSE

The Agency's authority to establish treatment standards based on grab sampling has already been upheld. Chemical Waste Management, 976 F. 2d at 34

B) The same opinion upheld the principle that it is inherently reasonable to require compliance with treatment standards based upon the sampling methodology used to establish the treatment standard. Id.

C) That is precisely what the Agency has done here: all treatment standards for nonwastewaters are based exclusively upon data gathered through grab sampling.

D) There is no contradiction with wastewater treatment standards using composite sampling to evaluate compliance. These standards were developed using composite sampling data exclusively.

EPA thus does not view the issue of whether standards should be based on grab sampling

to be presented here. As just noted, that is a settled issue. The only issue in this proceeding is whether the compliance regime is based upon the sampling method used to establish the treatment standard, and the answer to that question is “yes.” The Agency has developed data for nonwastewater treatment standards which is based exclusively upon grab sampling.

DCN PH4P067
COMMENTER Horsehead/Zinc Corp.
RESPONDER AC
SUBJECT GRAB
SUBJNUM 067

COMMENT

Horsehead Resource Development Company, Inc. ("HRD") and Zinc Corporation of America ("ZCA") jointly submit these comments in response to the United States Environmental Protection Agency's ("EPA" or the "Agency") proposed "Phase IV" land disposal restrictions rulemaking. 60 Fed. Reg. § 43654 (August 22, 1995) ("Phase IV Proposal"). The Phase IV Proposal includes three critical errors that require correction in the final rule. First, EPA mistakenly asserts that the treatment standards for metal constituents specify grab rather than composite sampling for compliance purposes.

PH4P067
K061/GRAB

1. First Third LDR Rulemaking (August 17, 1988)
On August 17, 1988, EPA established a treatment standard for "high-zinc" K061 (15 percent or greater zinc) nonwastewaters as "no land disposal," rather than setting concentration-based toxicity characteristic leaching procedure ("TCLP") limits, because the Agency found that: 1) high temperature metals recovery ("HTMR") is the Best Demonstrated Available Technology ("BDAT") for K061; and 2) K061 is "indigenous" to HTMR devices such as those operated by HRD. 53 Fed. Reg. § 31138 (Aug. 17, 1988). Although EPA collected composite samples from HRD's facility in 1987 in support of this rulemaking, it did not rely on the data at that time because of the Agency's decision to establish the "no land disposal" treatment standard.

2. Revised Treatment Standards for High-Zinc K061 (August 19, 1991).
EPA developed and promulgated numerical treatment standards for zinc and 12 other BDAT list metals for high-zinc K061 in 1991. 56 Fed. Reg. § 41164 (Aug.

19, 1991) (EPA reserved the treatment standard for vanadium.) EPA used data from four HTMR processes to set the TCLP limits: 1) International Metals Reclamation Company ("INMETCO"); 2) HRD (both 1987 and 1991 data); 3) International Mill Service ("IMS"); and 4) SKF:
1. All of the INMETCO data (which were based on processing of K061, K062 and F006 wastes) reflected composite sampling.
2. All of the HRD data (including the 1987 EPA-collected data and the 1991 data submitted by HRD) reflected composite sampling.
3. The IMS data sets were a mix of composite and grab samples.
4. Only a single SKF data set was used and the nature of the sample is unknown.
Most significantly, HRD's and INMETCO's composite data were used to establish the majority of the treatment standards.

Consistent with the sources of the data, in 1991 EPA established compliance with the K061 treatment standards based on the maximum for any single composite sample. See 56 Fed. Reg. at 41169 (table of BDAT treatment standards for K061) (attached to these comments as Exhibit 1). In fact, the use of composite sampling to determine compliance with the treatment standards was essential to implement EPA's stated intent that the final BDAT standards be "achievable by all of the major HTMR technologies." 56 Fed. Reg. at 41169 (emphasis added). Since all of the data that EPA used from HRD and INMETCO reflected composite samples, EPA would have had no basis for stating was that the treatment standards were "achievable by all the major HTMR technologies" if compliance had been measured on the basis of grab samples. This is equally true now, especially since the HRD, INMETCO, and IMS technologies still account for the preponderance of HTMR processing of K061.

Given this information, EPA had no alternative in 1991 but to require compliance with the BDAT treatment standards based on the maximum for any single composite sample. EPA neglected, however, to include that condition when it transferred (in the same 1991 rulemaking) the revised K061 treatment standards to the table at 40 C.F.R. § 268.41, which covered hundreds of other wastes. Since the treatment standards for other nonwastewaters generally were based on grab samples, this error created the false impression that the K061 treatment standards were also based on grab sampling, even though they actually were based on composite sampling.

3. Phase I LDR Regulations (August 18, 1992).

In August 1992, EPA simplified the treatment standards for K061 by merging the standards for high-zinc and low-zinc K061 into a single set of standards reflecting the August 1991 high-zinc TCLP concentration limits, which were based on HTMR. 57 Fed. Reg. 37194 (Aug. 18, 1992). EPA did not consider any additional

data sets; it relied entirely on the INMETCO\HRD\IMS\SKF data, which consisted principally of composite samples, from the 1991 rulemaking.

As in the case of the August 1991 rulemaking, EPA's preamble discussion of the merger of the standards clearly states that compliance with the TCLP limits was based on the maximum for any single composite sample. See 57 Fed. Reg. at 37209 (table of final treatment standards for K061, which indicates that the treatment standards are based on composite sampling) (attached to these Comments as Exhibit 2). Despite the specific and unambiguous preamble statement that compliance with the K061 treatment standards was based on composite sampling, EPA again administratively erred by not transferring the composite sampling requirement to the consolidated treatment standards table at 40 C.F.R. § 268.41, thus leaving the mistaken impression that compliance with the treatment standards for K061 could be based on grab sampling.

As in the case of the August 1991 rulemaking, EPA's preamble discussion of the merger of the standards clearly states that compliance with the TCLP limits was based on the maximum for any single composite sample. See 57 Fed. Reg. at 37209 (table of final treatment standards for K061, which indicates that the treatment standards are based on composite sampling) (attached to these Comments as Exhibit 2). Despite the specific and unambiguous preamble statement that compliance with the K061 treatment standards was based on composite sampling, EPA again administratively erred by not transferring the composite sampling requirement to the consolidated treatment standards table at 40 C.F.R. § 268.41, thus leaving the mistaken impression that compliance with the treatment standards for K061 could be based on grab sampling.

As confirmation of EPA's actual historical intent to require composite samples, the Agency established the TCLP limits for the generic exclusion from the derived-from rule for HTMR residues from K061, K062 and F006 in terms of composite samples. See 57 Fed. Reg. 37209 (Table) (see Exhibit 2). Since the HTMR generic exclusion was not integrated into a single table with hundreds of other wastes, its composite sampling requirement was correctly transferred to 40 C.F.R. § 261.3(c)(2)(ii)(C)(l), which refers to the maximum for any single composite sample.

C. The UTS Levels for Metal Nonwastewaters are Based on Composite Sampling.

1. Proposed Phase II LDR Regulations (September 14, 1993).

In 1993, in the proposed Phase II LDR regulations, EPA proposed UTS limits for metal non-wastewaters based on the existing K061 treatment standard, which, as explained above, were based on HTMR. Accurately reflecting the K061 treatment standard sampling methodology, EPA expressed the UTS metal limits as the maximum TCLP concentration in any single composite sample. 58 Fed. Reg. § 48092, 48103 (table of proposed UTS metal standards) (attached to these Comments at Exhibit 3). As with the previous rules, however, EPA neglected to

incorporate the composite sampling requirement in the consolidated table of all UTS limits in the proposed regulations. See id. at 48200.

HRD, INMETCO and the Business Recycling Coalition informed EPA of this problem in the comment period in the proposed rule. HRD and the other commenters pointed out that EPA had established composite sampling as the basis for compliance with the K061 treatment standards in 1991, and requested that EPA conform the sampling requirement to the data used to establish the standards.

2. Final Phase II LDR Regulation. (September 19, 1994).

Inexplicably, despite EPA's clear precedent of establishing treatment standards for K061 based on composite sampling, and given that the UTS metal treatment standards were based largely on composite samples, EPA established compliance with the metal UTS limits (and for the individual waste codes for the regulated limits) based on the maximum for any single grab sample. 59 Fed. Reg. 47980, 47999. EPA took this action even though, with three exceptions not relevant here, the metals treatment standards are based on HTMR of K061, for which EPA had already required compliance based on composite sampling, and for which nearly all of the data were generated from composite samples.

Significantly, and contrary to EPA's stated policy that treatment standards must be "achievable by all of the major HTMR technologies," EPA did not demonstrate (and, indeed, did not have the data to demonstrate) in the Phase II rule that the major HTMR technologies could achieve the specified UTS limits if compliance were based on grab samples rather than composite samples. Since EPA previously established composite sampling as the basis for compliance with the K061 and UTS for metal nonwastewaters, EPA had no legal basis to establish the grab sampling requirement, and its decision to do so was arbitrary and capricious.

D. EPA Intended to Ensure that All Major HTMR Technologies Achieve the OTB.

As explained above, a primary consideration of EPA in setting the BDAT standards for metals (including the UTS) was that they should be "achievable by all the major HTMR technologies." 56 Fed. Reg. at 41169. EPA explained the BDAT methodology for the K061 treatment standards in the Phase II LDR rulemaking:

First, treatment standards were calculated individually for each HTMR process. Next, the four sets of standards were compared to one another. Based on this comparison, the Agency selected the highest standard for each metal from each of the four processes to allow for process variability and detection limit difficulties. . . . The Agency believed that this approach would derive limits achievable by all the major HTMR technologies. . . .

Memorandum from Anita Cummings to the Administrative Record for UTS (July 29, 1995) at 12 (CS2F-S0024) (emphasis added). Since all of the data EPA relied upon from HRD and INMETCO reflected composite samples, the Agency would not have been able to state that the treatment standards were "achievable by all the major HTMR technologies" if compliance were measured on the basis of grab samples. EPA's grab sampling requirement therefore is contrary to the Agency's BDAT methodology, which is grounded in common sense.

E. In. This Phase IV Proposal, a Composite Sampling Requirement Is Consistent With the Basis for the UTS and the Agency's Intent.

EPA should affirm that the treatment standards for UTS metals are K061 are based on composite samples for three reasons. First, EPA established the composite sampling requirement for K061 in 1991. Second, virtually all of the UTS metals for which HTMR is BDAT are based on composite samples. (HTMR is the BDAT for K061). Third, EPA intended that the BDAT metal standards would be achievable by all HTMR technologies, and HTMR is the basis for most of the standards.

Affirming in this rulemaking that composite sampling is the appropriate basis for determining compliance with the HTMR-based limits is particularly important because HRD and INMETCO are responsible for the preponderance of HTMR processing of K061. Since EPA does not have any data to show that HRD, INMETCO, or any other HTMR operator can achieve the BDAT and UTS standards on a grab sampling basis, and the rulemaking precedent is based on composite sampling, the Agency cannot state that grab sample-based standards are "achievable by all of the major HTMR technologies." Accordingly, to make the UTS metal standards and the K061 standards consistent with the applicable rulemaking precedent, and the Agency's stated objectives, composite sampling must be the basis for determining compliance for these standards.

HRD believes that, given the regulatory development history of the K061 and UTS metal treatment standards, the failure to specify that compliance with the UTS limits for metals (and with the nonwastewater TCLP limits for metals in listed wastes) was an inadvertent oversight, and that EPA's statement in the proposed Phase IV rule preamble concerning the grab sample requirement is incorrect. Accordingly, we suggest the following revisions to the appropriate regulations to codify the composite sampling requirement:

The second sentence of 40 C.F.R. § 268.40(b) should be revised to read as follows:

"For all nonwastewaters, compliance with concentration level standards for constituents other than metals is based on grab sampling; for metals, compliance with concentration level standards is based on composite sampling.

The last sentence of footnote 3 to 40 C.F.R. § 268.48

Table UTS should be revised to read as follows:

"All concentration standards for nonwastewaters other than those for metals are based on analysis of grab samples; in the case of metals, concentration standards for nonwastewaters are based on analysis of composite samples."

These corrections to the existing regulations will conform the sampling requirements for UTS metals to reflect the data and rationale EPA used to establish the BDAT treatment standards for K061 in 1991, and also confirm that composite sampling is the basis for compliance with the K061 treatment standards.

RESPONSE

EPA does not view the commenter's recitation of past history to be germane, except insofar as it reiterates the predicate for the reason for revising the current standards so that both the means of developing the standard and the means of compying with it are based upon the same sampling methodology: grab sampling. The Agency reiterates that treatment standards for metal constituents are to be based on grab samples for compliance purposes. The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990.) The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible result if composite sampling were to be used). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

DCN PH4P067
COMMENTER Horsehead/Zinc Corp.
RESPONDER AC
SUBJECT GRAB
SUBJNUM 067

COMMENT

Consistent with previous treatment standards established over several years and in multiple rulemakings, and to conform to the Agency's intent, EPA should confirm that compliance for the nonwastewater metal constituents in the UTS and listed hazardous waste K061 is based on composite rather than grab sampling.

RESPONSE

EPA has amended the rule to avoid this result. The treatment standards now reflect exclusively the performance of technologies based upon grab sampling, and compliance will likewise be measured exclusively by means of grab sampling. The Agency reiterates that treatment standards for metal constituents are to be based on grab samples for compliance purposes. The temporary exception of K061, K062, and F006 wastes managed at two HTMR facilities, Horse head Resource Development Company Inc., and International Metals Reclamation Company Inc. is no longer in force now that the standards are revised to be based upon grab sampling data exclusively.

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible result of using composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

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COMMENT

Despite years of rulemaking to the contrary, in late 1994 EPA revised its regulations without explanation to provide that compliance with the treatment standards for nonwastewater hazardous wastes, including treatment standards for metal constituents, is based on grab samples. 59 Fed.Reg. § 47980, 48046 (Sept. 19, 1994); codified at 40 C.F.R.§ 268.40(b). EPA explained its interpretation of this requirement in the preamble to the Phase IV Proposal:

The issue of grab versus composite sampling has been raised as needing clarification. As previously promulgated, these metal treatment standards specify grab samples. . . . The use of grab versus composite samples does not mean more frequent sampling is necessary. Grab samples normally reflect maximum process variability, and thus will reasonably characterize the range of treatment system performance. The sampling analysis for both wastewater and nonwastewater is composite and grab respectively (40 CFR 268.41 and 268.43).
60 Fed. Reg. at 43683/2.

With respect to hazardous waste K061 (emission control dust/sludge from the primary production of steel in electric arc furnaces) and the UTS for metals, EPA's position directly conflicts with previous LDR rules in which EPA required compliance with treatment standards for metal constituents and K061 based on composite sampling. These rulemakings established compliance based on composite sampling as early as 1991. Moreover, the data EPA used to develop treatment standards for K061 and the UTS for metals were based largely on composite samples from several recyclers of K061. Perhaps most relevant, the two principal commercial off-site recyclers of K061 submitted composite sampling data to EPA during the development of the treatment standards for K061. EPA's statement in the Phase IV proposal therefore represents an unlawful change in position by the Agency. Therefore, as we explain below in more detail, and based on the history of the K061 treatment

standards, EPA should confirm that compliance with the metal treatment standards in general and the K061 standards in particular is based on composite sampling (since EPA used the K061 treatment standards as the basis for nearly all of the metal standards).

By way of background, EPA established compliance with the treatment standards for K061 based on composite samples in 1991. 56 Fed. Reg. § 41164, 41169 (Aug. 19, 1991). Then, in the1994 Phase II LDR rule, EPA used the K061 treatment standards as the basis for 11 of the 14UTS for metal nonwastewaters. See 59 Fed. Reg. at 47998. (In other words, the Phase II LDR metal treatment standards also were based on composite sampling.) Notwithstanding the source of the treatment standard data, EPA inexplicably changed the basis for compliance with the metal standards in the Phase II final rule from composite to grab. Id. at 48046 (new 40 C.F.R. §268.40(b)).1/ Given the inconsistency between the basis for the metal treatment standards(composite sampling), which was developed over many years and with a significant regulatory history, and the purported compliance standard (grab sampling), EPA should correct the error(first made in the Phase II final rule) and confirm that the standard for compliance with the UTS metal nonwastewaters and K061 is composite sampling.

RESPONSE

Again, the earlier rules obviously did not establish an immutable principle that the treatment standard for K061 or any other prohibited waste, has to be based on composite sampling. Since the earlier data bases reflected some composite sampling data, EPA has indicated that until the standards for these wastecodes was amended, compliance could reflect a composite sampling regime. However, EPA has developed a new data base for metals treatment based exclusively upon grab sampling data. Consequently, compliance will be based on that same sampling regime. (Indeed , to do otherwise would provide an unwarranted regulatory break for facilities. This is because the new treatment standards reflect maximum variability, and therefore are higher values than standards which would have reflected composite sampling. Obviously, facilities should not now get the benefit of the higher numerical treatment standards, but the more lenient sampling regime.)

The Agency thus reiterates that, the treatment standards for metal constituents are to be based on grab samples for compliance purposes, with the temporary exception of K061, K062, and F006 wastes managed at two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc. The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from

any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

The Agency also notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR and/or stabilization technologies.

DCN PH4P067
COMMENTER Horsehead/Zinc Corp.
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COMMENT

Given this information, EPA had no alternative in 1991 but to require compliance with the BDAT treatment standards based on the maximum for any single composite sample. EPA neglected, however, to include that condition when it transferred (in the same 1991 rulemaking) the revised K061 treatment standards to the table at 40C.F.R. § 268.41, which covered hundreds of other wastes. Since the treatment standards for other nonwastewaters generally were based on grab samples, this error created the false impression that the K061 treatment standards were also based on grab sampling, even though they actually were based on composite sampling.

RESPONSE

This comment again is not germane to the final rule, except in establishing the reasons the Agency needed to amend the rule if grab sampling were to be used as the exclusive means of compliance sampling, and explaining the interim sampling regime EPA adopted for these wastes until the rule was amended. In the second supplemental Phase IV proposed rule (62 FR 26047, May 12, 1997), EPA noted that the current treatment standards for hazardous waste K061, K062, and F006 were based partially on the use of composite rather than grab sampling. The Agency also noted that the BDAT technology for K061 was HTMR and data used to develop parts of the standard came from composite samples. Based on concerns raised by HTMR facilities regarding the treatability of TC metals using grab samples, the Agency in the second supplemental proposal,

temporarily allowed two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc., to comply with the current treatment standards for K061, K062, and F006 through the use of composite samples. However, EPA's ultimate intent is to require compliance with UTS on a grab sampling basis for all facilities.

The Agency notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR technologies.

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As in the case of the August 1991 rulemaking, EPA's preamble discussion of the merger of the standards clearly states that compliance with the TCLP limits was based on the maximum for any single composite sample. See 57 Fed. Reg. at 37209 (table of final treatment standards for K061,which indicates that the treatment standards are based on composite sampling) (attached to these comments as Exhibit 2). Despite the specific and unambiguous preamble statement that compliance with the K061 treatment standards was based on composite sampling, EPA again administratively erred by not transferring the composite sampling requirement to the consolidated treatment standards table at 40 C.F.R. § 268.41, thus leaving the mistaken impression that compliance with the treatment standards for K061 could be based on grab sampling.

RESPONSE

This comment again is not germane to the final rule, except in establishing the reasons the Agency needed to amend the rule if grab sampling were to be used as the exclusive means of compliance sampling and explaining the interim sampling regime EPA adapted for these wastes until the rule was amended.[In the second supplemental Phase IV proposed rule (62 FR 26047, May 12, 1997), EPA noted that the current treatment standards for hazardous waste K061, K062, and F006 were based partially on the use of composite rather than grab sampling. The Agency also noted that the BDAT technology for K061 was HTMR and data used to develop parts of the standard came from composite samples. Based on concerns raised by HTMR facilities regarding

the treatability of TC metals using grab samples, the Agency in the second supplemental proposal, allowed two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc., to comply with the current treatment standards for K061, K062, and F006 through the use of composite samples. However, EPA's ultimate intent is to require compliance with UTS on a grab sampling basis for all facilities.

The Agency notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR technologies.

DCN PH4P096
COMMENTER INMETCO
RESPONDER AC
SUBJECT GRAB
SUBJNUM 096

COMMENT

Introduction

These Comments are submitted by The International Metals Reclamation Company, Inc. ("INMETCO"), a wholly owned subsidiary of Inco United States, Inc., which in turn is a wholly owned subsidiary of Inco Ltd., a Canadian corporation. INMETCO's Comments address a narrow aspect of the proposed Phase IV Land Disposal Restrictions ("LDR") rule, the question of whether the Best Demonstrated Available Technology ("BDAT") universal treatment standards ("UTS") for metals should specify grab or composite sampling. See 60 Fed. Reg. 43654, 43683 (August 22, 1995). Performance data from INMETCO's high temperature metals recovery ("HTMR") process were used as one of the critical data sets to establish the BDAT/UTS limits for metals, and EPA intended that the resulting treatment standards would be consistently achievable by INMETCO's process and other HTMR operations.

INMETCO believes that compliance with the nonwastewater UTS limits for metals under the LDR program should be based on composite, rather than grab, sampling. In these Comments, we explain why. In Part I below, we describe INMETCO's HTMR process and outline briefly the environmental and other benefits that an HTMR process like INMETCO's provides. In Part II, we show that the data underlying EPA's development of the nonwastewater BDAT/UTS limits for metals do not support a requirement that the limits be met on the basis of grab sampling. In Part III, we note that expressing the nonwastewater UTS limits for metals in terms of composite sampling

would be consistent with the approach that EPA has followed in evaluating delisting petitions for metal-bearing wastes and in setting generic exclusion levels from the "derived-from rule" for HTMR slags. We also explain why measuring compliance on the basis of composite sampling would not create any special difficulties for the enforcement program.

I. Description of INMETCO's HTMR Process and Its Environmental Benefits

As far as we are aware, INMETCO, located in Ellwood City, Pennsylvania, currently operates the only pyrometallurgical process in the United States designed to recover nickel and chromium from metal-bearing secondary materials. In brief, the process works as follows. Various hazardous and nonhazardous nickel- and chromium-containing secondary materials (including K061, K062, and F006) generated primarily in the specialty steel and metal finishing industries are transported (under hazardous waste manifests, where applicable) to INMETCO, where they are temporarily stored in accordance with the company's Part B hazardous waste storage permit before entering the HTMR process. In recent years, Ni-Cd batteries have become an increasingly important feedstock for INMETCO, which is the only facility in the United States capable of thermally processing Ni-Cd batteries. The various metal-bearing materials are shredded, where necessary, and blended together with carbon fines (which promote the reduction of metal oxides) to produce a feed material which is pelletized and fed into a Rotary Hearth Furnace ("RHF"). In the RHF, nickel oxides and some iron oxides are reduced to the metallic state, and all chromium is reduced from the hexavalent state to the trivalent form. The heated, partially reduced pellets are removed from the RHF, mixed with carbon additives, dolomite and metal additives, and then fed into an Electric Arc Furnace. INMETCO uses dolomite, rather than straight lime, in order to ensure that its slag coproduct, once cooled, will form into a hard solid matrix that resists abrasion, dusting, and leaching. By carefully controlling the slag chemistry, INMETCO is able both to extend the life of the chrome refractory lining of its electric furnace and to ensure that its slag has suitable and uniform properties for use in road building and similar construction applications when it is crushed and sized after cooling. This allows it to compete in the marketplace with mined aggregates and steel manufacturing slags. In the Electric Arc

Furnace ("EAF"), chromium oxides and the remaining iron oxides are reduced to the metallic state, and a molten metal and slag coproduct are produced. Periodically (typically from three to five times per day) the molten metal is tapped from the EAF and cast into remelt alloy pigs weighing approximately 14 kg through the use of a twin strand pig caster. The remelt alloy consists of approximately 10 percent nickel, 14 percent chromium, 68 percent iron, 1.5 percent manganese, 1.0 percent molybdenum, and the balance carbon and other minor elements. For the most part, the remelt alloy is returned, under tolling agreements, to customers who furnished various metal-containing feed materials and who use the remelt alloy as a feedstock to produce specialty steel. The balance of the remelt alloy is sold to other specialty steel mills in the United States and abroad. The coproduct slag also is tapped from the furnace periodically (typically five to seven times per day) and is then cooled in a thin sheet, crushed, sized, and sold as aggregate for road building and related applications, just as comparable steelmaking slags have been used for decades in the United States. In 1994, INMETCO recycled more than 58,000 tons of secondary materials -- including approximately 18,000 tons of K061; 10,600 tons of hazardous and nonhazardous filter cakes;8,900 tons of swarf; 8,600 tons of mill scale; 2,800 tons of grindings; 2,200 tons of Ni-Cd batteries; and 1,700 tons of nickel and chromium catalysts. From these materials, INMETCO was able to recover for direct reuse (in the case of nickel, chromium, iron, manganese, and molybdenum) or for further processing at an outside HTMR facility (in the case of cadmium, lead, and zinc) approximately 98 percent of the nickel, 86percent of the chromium, 96 percent of the iron, 60 percent of the manganese, 92 percent of the molybdenum, 97 percent of the cadmium, 87 percent of the lead, and more than 99 percent of the zinc. By the second quarter of 1996, INMETCO expects to be operating newly installed cadmium retort furnaces, so that it will be able to recover the cadmium directly on site. In 1994, INMETCO produced approximately 23,600 tons of remelt alloy ingots containing approximately 2,400 tons of nickel, 3,350 tons of chromium, and 16,000 tons of iron, along with smaller quantities of molybdenum. If they were not sent to INMETCO for processing, these metals would likely be buried in the ground, creating additional risks to the environment, and would be lost to productive reuse in commerce. Instead, INMETCO recovers them in the form of metal ingots that are used as a feedstock in the production of stainless and specialty steel. In all, since 1978, INMETCO has prevented

more than 833,000 tons of metal-bearing materials from being discarded as waste and buried in the ground. INMETCO's HTMR process provides important environmental, resource recovery, and other benefits. As EPA recognizes, metals cannot be destroyed, only transformed, and they are a non-renewable resource. At the same time, metals are infinitely recyclable. By recycling metal-bearing secondary materials in a recovery process, we can use the same metal over and over again. This allows us to achieve a number of important environmental and other objectives, including the following:

- Metals recovery, as EPA recognizes, "conserves nonrenewable resources". The conservation of valuable material is one of the objectives explicitly articulated in Section1003(a) of RCRA, and metals probably are the best example of anon-renewable resource whose conservation EPA should seek to promote. For example, on average, every ton of nickel recovered by INMETCO from secondary materials that otherwise would be discarded as waste saves the mining of 110 tons of virgin nickel-bearing ore.

- Metals recovery "reduces energy demands and pollution as compared to producing metal from virgin ore,"which tend to have lower concentrations of metals than many reclaimable secondary materials. INMETCO, for example, uses less than half as much energy to produce a pound of nickel and chromium from secondary materials as its parent company does to produce a pound of nickel and copper from virgin ore in Canada. On average, the generation of one kilowatt hour of electricity produces 1.5 pounds of carbon dioxide, 5.8 grams of sulfur dioxide, and 2.5 grams of nitrogen oxide. At that rate, the fact that INMETCO's HTMR process is 50 percent more energy efficient than metal production from virgin ore means that in1993, the energy savings alone allowed INMETCO to produce its metal ingots while generating 32,675 fewer tons of carbon dioxide, 278 fewer tons of sulfur dioxide, and 120 fewer tons of nitrogen oxide than would have been generated if the same volume of metal had been produced from virgin ore. And, of course, INMETCO's process avoids producing the large volume of tailings associated with the mining of ores.

- By reducing the volume of metal-bearing hazardous and non-hazardous wastes that are discarded, metals recovery "keeps metal-bearing materials from being landfilled." In addition to preserving scarce landfill capacity, this "reduce[s] the mass loading of hazardous constituents to the environment,"and is thus consistent with an important national policy identified in the Hazardous and Solid

Waste Amendments of 1984.

- Metals recovery spurs pollution prevention efforts among waste generators. Certain hazardous constituents present in a waste may adversely affect the HTMR process or the metal produced in the process. Consequently, waste generators have an incentive to eliminate or reduce the presence of unwanted hazardous constituents in their waste in order to make it amenable to recovery. This is true, for example, of INMETCO's metal finisher customers, who may have to alter their production processes in order to reduce the concentrations of phosphorus, copper, and total cyanides in their F006 wastewater treatment sludge, so that the material will meet INMETCO's feedstock specifications. Metals recovery, as pointed out in EPA's Metal Recovery Report to Congress, also "serves our country's balance of payments and strategic interests." It does this by expanding supplies of metals for use in the manufacture of commercial and consumer products and by reducing U.S. purchases of primary metals, such as chromium, from foreign sources.

In sum, as EPA has observed, high temperature metals recovery "is important not only [to achieving the objectives set forth] in RCRA but to the U.S. economy in general." For these reasons, among others, EPA has judged HTMR to be the "best"technology and "BDAT for most metal constituents in nonwastewater forms of listed hazardous wastes." INMETCO has been proud to serve our country's environmental, economic, and strategic interests by providing this technology since 1978, and we look forward to continuing to do so in the future.

RESPONSE

EPA thanks the commenter for providing background information on the high temperature metals recovery process. The commenter's concerns regarding sampling are addressed separately elsewhere in this document.

DCN PH4P096
COMMENTER INMETCO
RESPONDER AC
SUBJECT GRAB
SUBJNUM 096

COMMENT

II. The Underlying Data Do Not Support a Requirement that Nonwastewater UTS Limits for Metals Be Met on the Basis of Grab Sampling.

In setting the nonwastewater UTS limits for metals other than arsenic, chromium, and mercury, EPA relied solely on the HTMR performance data that were used to establish the BDAT treatment standards for K061 -- or, more specifically, on the data that the Agency used to set the treatment standards for high zinc K061 in August 1991, which were extended to low zinc K061 in August 1992. No additional HTMR performance data we recollected in the Phase II LDR rulemaking or, with the exception of certain grab sampling data submitted by INMETCO late last year, in the Phase IV rulemaking either. As EPA acknowledges, the data used to set the BDAT treatment standards for K061 included composite sample results. In fact, all of the INMETCO performance data that EPA used to set the K061 BDAT limits (and the derivative UTS limits) for metals consisted of monthly composite sampling results that INMETCO submitted to the Agency in its May 13, 1991 Comments on the proposal to revise the high zinc K061 treatment standards. Those data were used to set the K061 BDAT and UTS limits for beryllium, nickel, and thallium. Most of the other BDAT metal treatment standards were based on composite sample data from the HTMR zinc recovery process of Horsehead Resource Development Company ("HRD"). Using its BDAT methodology, EPA calculated a treatment standard limit for each metal by applying a variability factor to the mean (average) treatment performance value for the metal in the relevant data set. The variability factor accounts for"inherent mechanical limitations in treatment control systems, treatability variations caused by changing influent loads, unavoidable variations in procedures for collecting treated samples, or variations in sample analysis." To develop the BDAT/UTS treatment standards for metals other than arsenic, chromium, and mercury, EPA used four datasets -- (1) a data set from SKF Plasma Technologies, (2) a dataset from International Mill Service, (3) the monthly composite sample data set submitted by INMETCO, and (4) a combined data set from HRD. EPA's objective was to set BDAT (and derivative UTS) standards for metals that would be "achievable by all of the major HTMR technologies." Accordingly, the Agency set the treatment standards as follows:

"First, treatment standards we recalculated individually for each HTMR process. Next the four sets of standards were compared to one another. Based on this comparison, the Agency selected the highest standard for each metal from each of the four processes to allow for process variability and detection limit difficulties . . . . [T]he Agency believed that this approach would derive limits achievable by all of the major HTMR technologies. . .."

This is a logical approach to follow, as long as the nature of the various data sets is taken into account. As noted above, the INMETCO data set consisted of composite samples. Thus, the treatment standard values that EPA derived from this data set by calculating variability factors and applying them to the mean performance values for the various metals in the dataset may adequately reflect variability within INMETCO's composite sample data. They do not, however, adequately reflect the range of, or variability within, grab sample results. Since all of the data that EPA used from INMETCO to set BDAT/UTS standards and much of the data that EPA used from HRD reflected composite samples, the Agency was not in a position to say that the treatment standards are "achievable by all of the major HTMR technologies" when measured on the basis of grab sampling. EPA seemed to recognize this point at the time the nonwastewater BDAT metal treatment standards were set. In order to reconcile --
(I) its intent that the BDAT standards would be achievable by all the major HTMR technologies, and
(ii) the fact that much of the HTMR performance data on which the standards were based reflected the testing of composite samples,
EPA made clear in the preambles to the final rules setting the BDAT treatment standards for K061 that compliance with the standards was to be based on the maximum for any single composite sample. Through apparent inadvertence, this point got lost in the process of transferring the K061 treatment standards into the table in § 268.41 of the Code of Federal Regulations, which covered hundreds of other wastes for which the standards were based on grab samples. That inadvertent mistake should now be corrected.

RESPONSE

This comment likewise indicates why some type of regulatory amendment is needed if compliance with treatment standards for all nonwastewaters is to be based upon grab sampling. In the second supplemental Phase IV proposed rule (62 FR 26047, May 12, 1997), EPA noted that the current treatment standards for hazardous waste K061, K062, and F006 were based

partially on the use of composite rather than grab sampling. The Agency also noted that the BDAT technology for K061 was HTMR and data used to develop parts of the standard came from composite samples. Based on concerns raised by HTMR facilities regarding the treatability of TC metals using grab samples, the Agency in the second supplemental proposal, allowed two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc., to comply with the current treatment standards for K061, K062, and F006 through the use of composite samples -- as an interim measure pending regulatory amendments to develop standards for these wastecodes based upon performance ot the BDAT technologies measured exclusively by grab sampling. However, EPA's ultimate intent is to require compliance with UTS on a grab sampling basis for all facilities.

The Agency notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR technologies.

DCN PH4P096
COMMENTER INMETCO
RESPONDER AC
SUBJECT GRAB
SUBJNUM 096

COMMENT

In the present rulemaking, EPA has implicitly conceded that, because the database underlying the nonwastewater UTS limits for metals included composite samples, the UTS limits may not be consistently achievable on the basis of grab sampling. As noted above, the Agency set the BDAT and UTS limits for beryllium on the basis of monthly composite sampling data submitted by INMETCO. Applying its BDAT standard-setting methodology, EPA multiplied the mean value of the INMETCO monthly composite sample data for beryllium (0.0073 mg/l) by a variability factor of 1.9,to produce a BDAT (and derivative UTS) limit of 0.014 mg/l. That value may reflect what is achievable, taking account of variability in the results of composite sampling, but it does not reflect the greater variability that would be expected for grab sampling data. EPA has acknowledged that fact in the present rulemaking and now proposes to increase the UTS limit for beryllium to 0.04 mg/l. The new limit is based upon a statistical analysis of grab sampling data from INMETCO, showing that the UTS limit of 0.014 mg/l (set on the basis of composite sample results) cannot be met consistently on

the basis of grab sampling. To further illustrate the problem of measuring compliance with UTS limits on the basis of grab samples, INMETCO collected random grab samples of its slag (every 20th slag tap)during the months of September and October 1995 and analyzed them for TCLP levels of various metals. The analytical results for nickel and selenium are presented in Table 1 below.

Table 1 Random Grab Sample TCLP Results (in mg/L) for INMETCO's Slag: September and October 1995

DATA ARE NOT REPRODUCED HERE

Using EPA's methodology, we calculated the mean and standard deviation of the log transformed data for the nickel and selenium values shown in Table 1 and applied EPA's BDAT formula to derive the appropriate treatment standard level (i.e., the C99value below which 99 percent of the TCLP performance results are estimated to fall). For these random grab sample data, the BDAT/UTS treatment standard value for nickel would be 7.1 mg/l, while for selenium it would be 0.20 mg/l. These values are higher than the comparable UTS limits of 5.0 mg/l for nickel and 0.16 mg/l for selenium. The values included in Table 1 above reflect random grab sampling results. INMETCO's experience suggests that slags having the highest total chromium composition tend to exhibit somewhat higher TCLP levels of various metals. Table 2 below shows the nickel and selenium TCLP grab sample results for the four highest chromium composition slags produced during each of the months of September and October 1995. When the data in Table 1 are expanded to include the data from Table 2, the calculated treatment standard levels (i.e., the C99 values below which 99 percent of the TCLP performance results are estimated to fall) are found to be even higher.

Table 2 Grab Sample TCLP Results (in mg/L) Four Highest Total Chromium Composition Slags Produced at INMETCO in September and October 1995

DATA ARE NOT REPRODUCED HERE.

These data confirm what EPA discovered in the case of beryllium. They show that the BDAT/UTS nonwastewater limits that EPA calculated for metals on the basis of data that included (or, in some cases, consisted solely of) composite samples will not be consistently achievable if compliance is measured on the basis

of grab samples. As noted above, a primary EPA objective in establishing the BDAT/UTS limits was to ensure that they are achievable by the major HTMR technologies. In light of the very significant environmental and other benefits that HTMR technologies provide, this is indeed an important objective. In order to ensure that it can be met, compliance with the nonwastewater UTS limits for metals should be determined on the basis of composite samples, not grab samples. Sections 268.40 and 268.48 of the regulations should be revised to reflect this point.

RESPONSE

The revised data base indicates that the standards, as amended, can be met consistently using a grab sampling regime. In the second supplemental Phase IV proposed rule (62 FR 26047, May 12, 1997), EPA noted that the current treatment standards for hazardous waste K061, K062, and F006 were based partially on the use of composite rather than grab sampling. The Agency also noted that the BDAT technology for K061 was HTMR and data used to develop parts of the standard came from composite samples. Based on concerns raised by HTMR facilities regarding the treatability of TC metals using grab samples, the Agency in the second supplemental proposal, allowed two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc., to comply with the current treatment standards for K061, K062, and F006 through the use of composite samples. However, EPA's ultimate intent is to require compliance with UTS on a grab sampling basis for all facilities.

The Agency notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR technologies.

DCN PH4P096
COMMENTER INMETCO
RESPONDER AC
SUBJECT GRAB
SUBJNUM 096

COMMENT

III. Measuring Compliance with Nonwastewater UTS Limits for Metals on the Basis of Composite Sampling Would Be consistent With the Approach Followed Under the Delisting and Generic

Exclusion Programs, and Would Not Create Difficulties in Enforcement.

A. Consistency With Delisting and GenericExclusion Compliance Determinations

In Part II above, we showed that the data underlying EPA's establishment of nonwastewater BDAT/UTS limits for metals do not support a requirement that compliance be measured on the basis of grab samples. To the contrary, as EPA now recognizes in the case of beryllium (and as we have shown with the examples of nickel and selenium), if the UTS limits for metals are set to reflect grab sampling data, they would have to be higher than when the limits are based on composite sampling data. That alone is sufficient reason to measure compliance with the nonwastewater UTS limits for metals on the basis of composite sampling results. Another reason is that composite sampling is the basis that EPA has specified for evaluating compliance with TCLP limits for metals in delisting determinations. For example, in a recent delisting decision for chemically stabilized electric arc furnace dust, EPA specified that initial verification testing for compliance with the designated TCLP limits must reflect the results of composite sampling and that subsequent verification testing must be based on monthly composite samples. EPA also has specified composite sampling as the basis for determining whether HTMR slags qualify for the generic exclusion from the"derived-from rule." The composite sampling approach that EPA has applied for determining compliance with TCLP metal limits under the delisting and generic exclusion programs is sound. It should be used to demonstrate compliance with UTS nonwastewater limits for metals under the LDR program as well. B. Enforcement Considerations In the Background Document for this proceeding, EPA suggests that evaluating compliance with UTS limits on the Basis of grab sampling is necessary in order to avoid adding "another layer of complexity to regulatory compliance determinations." EPA appears to believe that if compliance were based on composite sampling, "enforcement personnel would be faced with having to perform composite sampling from a group of drums [or other waste depositories] that may or may not have any correlation with The composite sample technique used when treatment standards we redeveloped. On the other hand, . . . if treatment standards are based on grab samples . . . enforcement personnel could simply take a grab sample from any drum [or batch] and, thereby,

make a compliance determination." EPA's analysis of this point is flawed, and its concern is misplaced. We can sympathize with EPA's reluctance to have compliance sampling conducted on a basis that "may not have any correlation with the . . . sample technique used when treatment standards were developed." However, as shown in Part II of these comments, this is an argument for using composite sampling, rather than grab sampling, to determine compliance with the UTS LIMITS for metals: EPA's calculation of the BDAT/UTS limits for metals was based, to a large extent, on composite sample data; accordingly, EPA enforcement personnel should measure compliance with those standards on the basis of composite samples as well. EPA's fear that composite sampling would add a "layer of complexity" to regulatory compliance determinations is overblown. After all, as noted above, compliance with TCLP metal limits under both the delisting program and the generic exclusion rule is determined on the basis of composite sampling. The same is true for determining compliance with UTS limits in wastewaters. We are not aware that this has made compliance determinations particularly complex. Any legitimate concerns that EPA might have about basing regulatory compliance determinations on composite sampling can be addressed adequately by requiring HTMR operators (and generators of other wastes subject to the nonwastewater UTS LIMITS for metals) to preserve samples from each slag tap (or each batch of waste generated) and to prepare a composite of these samples covering an appropriate time period, e.g., monthly composites. The generator could be required to retain these samples for whatever period of time is reasonably necessary to accommodate the needs of the enforcement program. EPA personnel could then request one or more composite samples from the generator for purposes of making a compliance determination. In sum, EPA's concern about the potential complexity of enforcement is misplaced. Compliance with the nonwastewater UTS LIMITS for metals can be based on composite sampling without creating any special difficulties for the enforcement program.

RESPONSE

As noted in response to the Chem Waste comment, the Agency did not intend to, and did not reopen the issue of whether treatment standards can permissibly be based upon grab sampling, or whether they should be. The question is, what standards are achievable if grab sampling is used as the means of compliance. As the commenter indicated, certain standards would have to be increased to reflect the greater variability inherent in this type of a sampling regime, and EPA has done so in the final rule. The Agency reiterates that, the treatment standards for metal

constituents are to be based on grab samples for compliance purposes, with the temporary exception of K061, K062, and F006 wastes managed at two HTMR facilities, Horse head Resource Development Company Inc. and International Metals Reclamation Company Inc. The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

The Agency also notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR and/or stabilization technologies.

DCN PH4P097
COMMENTER Hazardous Waste Management
RESPONDER AC
SUBJECT GRAB
SUBJNUM 097

COMMENT

With regard to the grab verse composite sampling issue, the Agency needs to reevaluate its position that wastewaters require composite and nonwastewaters require grab samples. The Agency's preamble discussion (60 FR 43683) which states:

"While UTS nonwastewater limits for metals specify a grab sample, the data used to develop standards included both grab and composite samples".

That UTS levels were not all established using grab samples, indicates that the Agency recognizes that composite samples for nonwastewaters may be appropriate. As such, the Agency should allow the use of both sampling methods for nonwastewaters, and for enforcement purposes, the Agency should utilize the same method employed by the generator or TSDF.

RESPONSE

The Land Disposal Restrictions LDR Program does not recognize that composite samples for nonwastewaters may be appropppriate. During the development of Federal Register 60 43683, it simply reflected the best data EPA could obtain at that time. Then, consistent with the principle that complaince is to be based upon the same mode of sampling used to develop the treatment standards, compliance with vertain of the existing standards whish reflected composite sampling in turn also had to be based on composite sampling. This does not affect EPA's policy preference for grab sampling.

The Agency reiterates that the treatment standards for metal constituents are to be based on grab samples for compliance purposes, with the temporary exception of K061, K062, and F006 wastes managed at two HTMR facilities, Horsehead Resource Development Company, Inc. and International Metals Reclamation Company, Inc.

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, because grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

The Agency also notes that the revised UTS numbers promulgated in the final Phase IV LDR rule for all the TC metals is based on treatment performance data from grab samples. (Please refer to the May 12, 1997 Federal Register Notice for new data on grab samples.) Therefore, the Agency believes that the UTS for the TC metals could be achieved through grab samples from commercially available HTMR and/or stabilization technologies.

DCN PH4P113
COMMENTER Chemical Manufacturers Association
RESPONDER AC
SUBJECT GRAB
SUBJNUM 113

COMMENT

6. CMA recommends composite sampling and questions why four samples are needed for each sampling event.

The Agency has proposed to use annual sampling of the wastewaters in the surface impoundment to determine if regulated constituents are present at concentrations that exceed the trigger level. The Agency has proposed that determinations of whether or not a trigger level has been exceeded would be calculated from a minimum of a four sample set on a four time per year basis (the Agency notes quarterly). CMA concurs that seasonal sampling may be appropriate but questions the requirement to use four samples per event. The only basis CMA can determine for requiring four samples per event is that that was what was finalized for the Subpart CC regulations in December 1994. The rationale under that rule that the wastes are potentially variable does not hold for wastewaters treated in impoundments. The variability of constituent concentrations in wastewaters in impoundments is slight at best, especially on a short-term sampling event, and requiring four samples per event is unnecessarily burdensome. If the Agency finalizes a requirement to use four samples per event, CMA requests that the Agency allow composite samples.

RESPONSE

The Agency appreciates the commenter's thoughts on sampling. However, the Agency believes that demonstration samples must consist of enough representative samples, but in no case less than four samples, taken over a period of time sufficient to represent the variability or the uniformity of the waste.
(See BDAT QA/QC Methodology Background Document)

Phase IV Second Supplemental Proposed Rule:
Comments and Responses on Demonstrating Compliance by Grab or Composite Sampling

1. 2P4P-00010 International Metals Reclamation Company, Inc. (INMETCO) and INCO United States, Inc.

As EPA acknowledges, the existing UTS/BDAT nonwastewater standards for most metals were developed in whole or in part on the basis of composite sampling data from HTMR facilities, including INMETCO. See 62 Fed. Reg. at 26047/2. And the standards were set on the assumption that they could be achieved by all the major HTMR facilities. See 56 Fed. Reg. 41164, 41169 (August 19, 1991). But, because of the greater variability in grab sampling results, a standard that can be met on the basis of composite sampling may not be achievable on the basis of grab sampling. See 62 Fed. Reg. at 26047. That is a principal reason why EPA is revising the metals standards to reflect solely grab sampling data. See id. In effect, the existing composite sample-based standards are being translated into grab sample-based standards of equivalent stringency. The new standards reflect the performance of the same technologies used to set the old standards, but that performance is now measured on the basis of grab sampling, rather than composite sampling. Thus, even in those cases where the numerical values are being revised upward to reflect grab sampling data, the standard is not being made less stringent; it is just being expressed in a different way -- i.e. the equivalent degree of stringency is being "translated" from composite to grab sampling.

EPA has recognized this point in the Phase IV Second Supplemental Proposal by providing that until the new grab sample-based standards are adopted, INMETCO and the other major HTMR operator, Horsehead Resource Development Company, may determine compliance with the BDAT standards for metals on the basis of composite sampling. See id. at 26047-48, 26069-70. INMETCO is able to meet the existing standards on a composite sample basis, and it expects to be able to meet the revised standards (assuming the adjustments suggested above are made) on a grab sample basis -- operating its HTMR process in precisely the same way. Thus, as far as INMETCO is concerned, the HTMR-based standards will not have become less stringent when the numerical values go up while, at the same time, the basis for determining the company's compliance shifts from composite to grab sampling. The standards will have been restructured, but their stringency will remain the same.

I. <u>Proposed Revisions of the UTS and BDAT Standards</u>

As explained in the Federal Register notice, EPA proposes to revise the present UTS/BDAT nonwastewater TCLP leachate standards for twelve metals as follows:

- The standard for antimony would be decreased from 2.1 mg/L to 0.07 mg/L;
- The standard for barium would be increased from 7.6 mg/L to 21 mg/L;
- The standard for beryllium would be increased from 0.014 mg/L to 0.02 mg/L;

- The standard for cadmium would be increased from 0.019 mg/L to 0.02 mg/L;
- The standard for chromium would be decreased from 0.86 mg/L to 0.85 mg/L;
- The standard for lead would be increased from 0.37 mg/L to 0.75 mg/L;
- The standard for nickel would be increased from 5.0 mg/l to 13.6 mg/l;
- The standard for selenium would be increased from 0.16 mg/L to 5.7 mg/L;
- The standard for silver would be decreased from 0.30 mg/L to 0.11 mg/L;
- The standard for thallium would be increased from 0.078 mg/L to 0.20 mg/L;
- The standard for vanadium would be increased from 0.23 mg/l to 1.6 mg/l; and
- The standard for zinc would be decreased from 5.3 mg/L to 4.3 mg/L.

In each case, the proposed standard reflects the higher of EPA's stabilization-based or HTMR-based "C_{99}" calculations, using solely grab sample data. See 62 Fed. Reg. at 26045/2. This differs from the existing nonwastewater metals standards, most of which were based on HTMR data reflecting, in whole or in part, the results of composite sampling. See id. at 26044/2, 26047. The proposed standards for antimony, barium, lead, selenium, thallium, vanadium, and zinc are based on data from stabilization processes, while the proposed standards for beryllium, cadmium, chromium, nickel, and silver are based on grab sample data from INMETCO.[fn2:See March 10, 1997 Memorandum to Anita Cummings from Howard Finkel, Attachment 5 (Item S0011 in Docket F-97-2P4P-FFFFF); Memorandum to Anita Cummings from Stan Moore of Versar Inc., enclosing Draft Report: Metals Treatment Standards Derived From Data Submitted by Industry (Item S0012 in Docket F-97-2P4P-FFFFF).] Because the higher of stabilization-based or HTMR-based calculations was used, EPA believes the standards will be achievable by both stabilization and HTMR technologies. See 62 Fed. Reg. at 26045/2. Having reviewed the data, we believe EPA has properly applied its BDAT methodology to calculate the proposed revised standards for antimony, barium, cadmium, chromium, lead, nickel, selenium, thallium, vanadium, and zinc. We caution, however, that the proposed revisions do not reflect grab sample data from another HTMR operation which may submit such data within the next few months. See 62 Fed. Reg. at 26047-26048. It is possible that data from that HTMR process will support a higher standard for one or more of these metals. Whatever may be the case for those metals, the proposed standard for silver, as explained below, should be increased to reflect -- at a minimum -- more complete grab sampling data from INMETCO. Moreover, EPA should consider whether the stabilization data for beryllium are too limited to conclude that the proposed standard of 0.02 mg/L is achievable by stabilization when higher beryllium content wastes are involved.

Response

The Agency appreciates the support provided by the commenter on this issue. EPA also largely agrees that the standards are equivalent, although the Agency has also gathered data on stabilization operations treating particularly hard-to-treat wastes in order to assure that treatment standards for all characteristic wastes are achievable. This methodology also accounts for some of the increase in the standards (such as the standard for lead, for example). It is also noted that, EPA has revised the treatment standards for antimony, beryllium, cadmium, chromium, nickel, and silver. Treatment standards for antimony, beryllium, and silver were revised based on new

data provided by commenters, that represented the “most difficult to treat” wastes. Thus, the Agency is promulgating revised UTS for antimony, beryllium, and silver at 1.15 mg/l, 1.22 mg/l, and 0.14 mg/l respectively. For cadmium, chromium, and nickel, the Agency has identified a technical error in the BDAT determination of the proposed standards. In applying the BDAT methodology for calculating the treatment standard, EPA failed to perform a “Z-score” outlier test. The Agency corrected this error and has re-calculated the treatment standards for cadmium, chromium, and nickel at 0.11 mg/l, 0.60 mg/l, and 11 mg/l respectively. Although these standards are more stringent than the proposed standards, based on the treatment performance data reviewed, the Agency believes that these new standards are also achievable by commercial treatment technologies such as stabilization and HTMR. (See the BDAT background materials in the docket for today’s rule, for additional information on the revised treatment standards.)

2. 2P4P-00012 The Ferroalloys Association (TFA)

The sampling technique proposed by this rule, grab sampling, contradicts procedures given in the US EPA prepared Test Methods for Evaluating Solid Wastes - SW-846, chapter nine. Chapter nine explains that it is imperative that composite sampling be used to eliminate selective sampling and that randomness achieves accuracy. However, the language in the proposed rule indicates that by requiring grab sampling, "there is an implementation advantage ... since enforcement for EPA, authorized states, or citizen groups is facilitated if enforcement can be based on individual sampling events." Therefore, the use of grab sampling will be required because it is easier.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

3. 2P4P-00017 Battery Council International (BCI) and Association of Battery Recyclers (ABR)

Before publishing the proposed standards, EPA had before it at least two data sets: a 200-point set of analyses of composite samples taken from six facilities over a several month

period of time[fn8: See comments of Battery Council International (Nov. 27, 1995) and Association of Battery Recyclers (Nov. 20,1995) submitted in response to EPA Land Disposal Restrictions Phase IV proposed rule (60 Fed. Reg. 43,654 (1995)). This data contained analysis of composite sampling results on the treatment of secondary smelter slag and contaminated soils.] and a much smaller set of analyses of grab samples taken over a much shorter period of time.[fn9: See Memorandum of Howard Finkel to Anita Cummings, supra.] EPA disregarded the first and relied solely upon the second. No effort was made, however, to select a representative set. For example, EPA's treatment standard for lead was derived from twenty-seven grab sample data points.[fn10: Id.] 276 other data points submitted by BCI and ABR, taken over several months, were ignored. Similarly, the Agency's treatment standard for beryllium was derived from only four grab sample data points.[fn11: Id.] The treatment standards for antimony, silver, and thallium were derived from nine, fourteen, and fifteen grab sample data points, respectively.[fn12: Id.]

This is far too limited a set of samples from which to calculate treatment standards. Such a limited sampling size will not adequately represent the variability of the D008 waste stream. This is particularly so for secondary smelter slag. Because of its physical and chemical composition, this slag is extremely variable, differing from one minute to the next and one week to the next. BCI and ABR note that, in other contexts, the Agency requires many more samples to be taken than were included in this set. For example, for municipal incinerator ash, a waste not as variable as secondary smelter slag, the Agency requires a total of fourteen eight-hour composite samples. These samples must be collected hourly for a total of eight hours for seven days.[fn13: Environmental Protection Agency, Sampling and Analysis of municipal Refuse Incinerator Ash (June 1995).]

The Agency has compounded its error by analyzing only grab samples, a one-time sample occurrence. Unless performed frequently over a several week period of time, and then analyzed using appropriate statistical techniques, these samples will fail to accurately characterize highly variable heterogeneous wastestreams. As discussed above, secondary smelter slag is extremely heterogeneous. Thus, unless many grab samples are taken over an extended period of time (which was not done by EPA in this instance), it will be only sheer coincidence if they are an accurate measure of this wastestream.respond to why used here but not w municipal ash.

Finally, all of the grab sample data points obtained from Rollins Environmental, which comprised the vast majority of the data points used by EPA in calculating the treatment standards for D008 wastes, were based on the treatment of remediation and other types of wastes, not of secondary smelter slag. Smelter slag however, has chemical and physical characteristics distinctly different from the remediation and other wastes obtained from Rollins. For example, secondary smelter slag is partly or completely solid, and of variable particle size. Because of this physical variably, its treatment through stabilization is much less effective than other types of D008 wastes. [fn14: All of the remaining data points used by EPA in the calculation of treatment standards for silver, antimony, beryllium, and thallium were collected by Rollins Environmental. See Memorandum of Howard Finkel to Anita Cummings, supra] were based on the treatment of remediation and other types of wastes, not of secondary smelter slag. Smelter slag, however, has

chemical and physical characteristics distinctly different from the remediation and other wastes obtained from Rollins. For example, secondary smelter slag is partly or completely solid, and of variable particle size. Because of this physical variably, its treatment through stabilization is much less effective than other types of D008 wastes.

EPA's reliance upon this data set ignored the much more comprehensive and representative data submitted by BCI, ABR and others in response to EPA's original proposed LDR Phase IV rule.[fn15: See comments of Battery Council International (Nov. 27,1995) and Association of Battery Recyclers submitted in response to EPA Land Disposal Restrictions Phase IV proposed rule (60 Fed. Reg. 43,654 (1995)).] BCI and ABR's data contained 276 composite data points for lead and 156 composite data points for selenium and barium in secondary smelter slag.[fn16: Id.] The data showed the 99th percentile confidence interval for stabilized slag to be 2.97 mg/l for lead, 2.48 mg/l for selenium, and 8.92 mg/l for barium.[fn17:Id] This level for lead is well above the treatment level now proposed by EPA.

This data was generated over a several month period, from six secondary lead smelters, and represents over one thousand individual grab sample points consolidated into composite samples. EPA ignored this data on the grounds that it was not obtained from grab samples and did not provide "in versus out data points."[fn18: See Overview of Five Data Sets Submitted in Response to Phase IV Proposed Rule: Treatment of Metals 4 (Dec. 1996).] This rationale fails for several reasons. First, it is inconsistent with past practice. In past LDR rulemakings, EPA has considered all of the relevant data in determining what treatment standards could typically be achieved. For example, in the Third -Third LDR rule EPA stated with regard to D008 treatment standards that although "[the majority of the data received by the Agency did not have the proper QA/QC, corresponding influent and effluent data, and design and operating parameters..... The Agency, nevertheless, evaluated all of the data to assess the range of waste variability and what standard could typically be achieved."[fn19: 55 Fed. Reg. 22,565 (1990] Had EPA evaluated all of the data it received in response to the original proposed Phase IV rule, it clearly would have recognized that the proposed treatment standard of .75 mg/ I for lead could not be achieved.

Second, the use of grab samples is inappropriate for analyzing highly variable D008 wastes.[fn20:The issue of whether grab sampling is an inherently unreliable method for measuring heterogeneous wastes, such as secondary smelter slag, for the development of treatment standards has not previously been subject to judicial review. See e.g., Chemical Waste Management v. United States EPA, 976 F.2d 2 (D.C. Cir. 1992), cert. denied 507 U.S. 1057 (1993).] Secondary smelter slag is extremely variable and heterogeneous. Three factors principally affect the variability of slags: (1) changes in concentration with respect to time; (2) changes in concentration where the material is partly or completely solid; and (3) changes in concentration where the material is of variable particle size. The constituents of waste materials comprised of particles larger in size than dust, including crushed slag from a discontinuous process such as secondary smelting of lead, are very inconsistent from one day to the next or one week to the next. Because of the highly variable nature of secondary smelter slag grab sampling, unless done frequently over

a extended period of time (which was not done by EPA), does not provide an accurate measure for the development of treatment standards (or, for that matter, the enforcement of existing treatment standards).

It is no doubt for this reason that SW-846 mandates that when analyzing heterogeneous wastes resulting from discontinuous or variable processes (such as lead-acid battery and other lead scrap smelting), statistically random samples of waste must be taken over extended periods of time.[fn21:Environmental Protection Agency, Test Methods for Evaluating Solid Waste, SW 846 3rd Ed (Nov. 1986).] Indeed, for highly variable waste operations, such as secondary lead smelting, EPA's SW-846 method further requires hundreds of samples to be taken and analyzed to obtain an adequate data baseline.[fn22: Id]

In contrast, as discussed above, BCI and ABR's composite sampling method combined over a thousand individual grab samples that were averaged into 276 composite samples for lead and 156 composite samples for barium and selenium. These composite samples represent an average concentration obtained over a several month period on the effectiveness of stabilization technologies.

Finally, comparison of "in versus out data points" is not meaningful when analyzing secondary smelter slag. As discussed above, secondary smelter slag is heterogeneous; its composition varies over time and space. It thus is wholly coincidental if incoming and treated slag samples are true pairs. A sample taken one inch from another can have dramatically different parameter concentrations.

Response

With respect to the comment on the data ignored by the Agency, itis noted that all of the data ignored came from composite sampling. The Agency has made a consistent policy decision for LDR not to look at average properties of a waste, but the entire waste. This best assures that treatment minimizes threats posed by that waste's land disposal. The Agency notes that composite sampling data are not appropriate for setting a treatment standard that is to be met based on grab samples. The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). The Agency views the authority to establish treatment standards based on grab sampling to a settled issue. 976 F. 2d at 34. Moreover, smelter slags were already prohibited in the very rule at issue in the ChemWaste decision, which upheld aithority to require compliance based on grab sampling where that is the basis of the sampling used in developing the treatment standard. Secondary smelter slag is extremely variable and heterogeneous. In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

The Agency also notes that the treatment performance data obtained and reviewed by the Agency from HTMR and stabilization facilities indicate that the TC metal-bearing wastes, including smelter slags can be treated to the UTS. EPA also believes this data based to be amply sufficient to make this determination, based in particular on the fact that the model treatment facilities were treating particularly difficult to treat wastes (including secondary lead slags) containing very high concentrations of various metals (including lead). EPA notes that the Fourth Circuit, in the Kennecott decision from 1986, has rejected an argument that EPA is compelled to use a particular data set to establish treatment standards because of the amount of data in the data set. Here, the commenter was amply on notice of the type of data the Agency would be using to establish the treatment standards, but ofr its own reasons provided a different type of data. The Agency thus had ample grounds in basing the treatment standard on properly-documented performance of properly-operated stabilization technology and HTMR technology. Likewise, sampling of the wastes used to establish the treatment standards confirms that the facilitiy was treating wastes as hard, or harder to treat, then the secondary lead slags referred to by the commenter.

In addition, the Agency notes that the mere existence of the secondary lead smelting industry itself proves the applicability of HTMR to D008 wastes. EPA repeats that, to compile further evidence regarding the treatability of TC metal wastes, including D008 wastes, to the UTS, the Agency conducted site visits to commercial hazardous waste treatment facilities and collected additional stabilization and HTMR treatment performance data that better represent the diversity of metal wastes than those previously used. The treatment performance data (based on grab samples) represented a wide range of metal-bearing wastes (both listed and characteristic) that the Agency believes represents the most difficult to treat metal-bearing wastes, based on the waste characteristics that affect the performance (WCAPS) of the treatment technology. The types of waste treated included battery slag, mineral processing wastes, baghouse dust, soils, pot solids, recycling by-products, and sludge. These waste streams contained multiple metals which would be representative of a characteristic waste with UHCs, and significant concentrations of combination metals including: lead and cadmium, barium and lead, and chromium and antimony. The Agency compared the treatment standards developed based on stabilization and HTMR and selected the highest (less stringent) standard for each metal to establish the proposed UTS, thus, allowing for process variability and detection limit difficulties.

In response to the commenters issue on data selection, the Agency reviewed the data submitted by the commenter, and found the data to be seriously lacking in form and quality assurance/quality control prerequisites. Specifically, the data submitted to the Agency were: (1) based on composite samples rather than grab samples, the latter being the only type used to develop BDAT treatment standards; (2) lacking in any quality assurance/quality control documentation; and (3) not accompanied with adequate indication that treatment process was in fact well designed and operated. Therefore, the Agency was unable to use the data for developing the BDAT treatment standards.

Also, the reference to SW-846 when analyzing heterogeneous waste. The Agency

believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion of this issue at 54 FR 26605, June 23. 1989 and 55 FR 22539, June 1, 1990.

The Agency also would like to note that if a particular waste possesses unique properties that make it more difficult to treat than the waste on which the standards are based, the affected party may petition the Agency for a treatability variance as per 40 CFR 268.44 on a case-by-case basis.

4. 2P4P-00037 CF Industries, Inc.

CF Industries, Inc. submits the following comments on the Environmental Protection Agency's (hereinafter EPA or the agency) May 12, 1997 proposal entitled *"Land Disposal Restrictions Phase IV.- Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill"* (hereinafter second supplemental proposal). In addition, CF Industries, Inc. endorses by reference comments submitted by The Fertilizer Institute and the Florida Phosphate Council.

CF Industries, Inc. (hereinafter CF or the company) is an interregional farm supply cooperative which is owned by and serves eleven regional cooperatives. CF manufactures nitrogen and phosphate fertilizers and purchases potash fertilizer for resale. We distribute these fertilizer products to over one million farmers and ranchers in 48 states and two Canadian provinces.

CF currently manufactures phosphate fertilizer in Florida and has two phosphogypsum stacks; one at its Plant City Phosphate Complex and one at its Bartow Phosphate Complex, which is operating at reduced capacity. As the agency is aware, through the process of manufacturing phosphate fertilizer, large quantities of phosphogypsum and process water are created. As a result, CF would be adversely affected by an agency decision to take regulatory action that would alter the scope of the
Bevill exclusion, which covers solid wastes from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock, from EPA's hazardous waste management requirements.

CF strongly supports the agency's earlier determination, following intense study and review, that Subtitle C regulation of the phosphate fertilizer industry was essentially unworkable and unwarranted. In addition, the company believes that, without additional Congressional action, the agency lacks the statutory authority to revisit its earlier determination in this matter. Further, in response to the agency's question regarding the need for additional study or regulatory controls (62 FR 26054), it is CF's belief, as supported by this document, that the state and local regulatory framework makes any additional Federal controls unnecessary.

The State of Florida has developed a comprehensive regulatory program for the management of phosphogypsum and process water. CF's comments will illustrate to EPA that Florida has developed a regulatory program that addresses environmental concerns relating to the phosphate industry without the need for an overriding, inflexible, command and control Federal regulatory structure, such as RCRA Subtitle C. The company firmly believes that the EPA's proposed reexamination of the Bevill exclusion is not warranted and that the agency should once and for all recognize that the Florida regulations provide adequate controls on the industry.

The following is a discussion of various issues related to the EPA's request for comments concerning potential changes to the Bevill exclusion for phosphate rock mining and mineral processing secondary materials.

Grab Sampling Versus Composite Sampling Would Be Overly Restrictive

On page 26047 of the second supplemental proposal, the agency discusses its decision to continue the use of grab sampling rather than the composite sampling procedure to determine compliance with RCRA. The use of a single grab sample versus a composite sample over the duration and expanse of a manufacturing process could potentially produce information that misrepresents the true nature of the material and its potential effect on the environment. Certainly where leakage of the material into the soils or groundwater is the mechanism of concern, a grab sample could grossly misrepresent the potential environmental impact while a composite sample would be appropriate. This could then result in the loss of the Bevill exempt status for the secondary material management system. CF urges the EPA to reconsider its decision.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

5. 2P4P-00038 The Fertilizer Institute

These comments are submitted by The Fertilizer Institute ("TFI") on behalf of its member companies in response to the United States Environmental Protection Agency's ("EPA" or

"Agency") May 12, 1997 proposal entitled "Land Disposal Restrictions Phase IV: Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill," 62 Fed. Reg. 26,041 (May 12, 1997) (hereinafter "second supplemental proposal"). EPA solicits comment on potential changes to the exemption from EPA's hazardous waste management requirements for certain secondary materials generated by the phosphate mining and mineral processing industry. The exemptions were based on EPA regulatory determinations that hazardous waste management requirements were not warranted. Consistent with EPA's conclusion underlying its prior regulatory determinations, application of those requirements could potentially threaten the industry's viability. As TFI explains herein, although EPA suggests revisiting its prior regulatory determinations, the Agency lacks the statutory authority to do so; EPA provides no explanation of whether the bases for its earlier phosphate industry regulatory determinations have changed; EPA fails to recognize the significant environmental controls currently imposed on TFI members; and EPA suggests it may conduct a reexamination of its earlier determinations based on purportedly new risk information that is either not new or is an inappropriate basis for reexamination. The continued exemption is critical to TFI's members as they have expended substantial resources in reliance on EPA's prior regulatory determinations and a change in that status is simply not warranted.

TFI is a non-profit trade association of the fertilizer industry. Its more than 200 member companies manufacture in excess of 90 percent of all domestically produced fertilizer. The second supplemental proposal potentially impacts, inter alia, the regulation of the mining and mineral processing of phosphate rock. Most of the phosphate rock mined and processed in the United States is used in the production of phosphoric acid for use in phosphate fertilizer.

One final issue of concern to TFI's member companies is EPA's continued requirement of demonstrating compliance by grab rather than composite sampling. Grab sampling, in the context of the large volumes of wastes generated in mining and mineral processing operations, could result in a single analytical outlier result implicating the Bevill status of extremely large scale and long-standing management systems for secondary materials. TFI believes such a consequence should not stem from a single grab sample.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of

composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

6. 2P4P-00039 American Iron and Steel Institute (AISI)

The American Iron and Steel Institute ("AISI"), whose member companies account for approximately two-thirds of the steel production capability of the United States, welcomes this opportunity to submit comments on the second supplement to the proposed Phase IV land disposal restrictions ("LDR") rule for metal wastes and mineral processing wastes, which was issued by the U.S. Environmental Protection Agency ("EPA") pursuant to the Resource Conservation and Recovery Act ("RCRA"). 62 Fed. Reg. 26,041 (May 12, 1997). During the course of their iron and steel making operations, AISI member companies generate a variety of metal-bearing secondary materials, some of which may be subject to regulation under the proposed rule. For this reason, AISI is keenly interested in the current supplemental proposal. AISI's main comments are summarized briefly below.

B. Compliance with Treatment Standards Should be Based on Composite Samples, Rather than Grab Samples

EPA has proposed to require that compliance with the LDR treatment standards be demonstrated on the basis of grab samples, rather than composite samples. The only exception to this rule is for the HTMR residues generated by two facilities: Horsehead Resource Development Company, Inc. ("Horsehead") and International Metals Reclamation Company, Inc. ("INMETCO"). Indeed, the Agency states that its "ultimate intent" is to require even these two facilities to comply with the treatment standards based on grab samples, rather than composite samples.

AISI strongly opposes the use of grab samples for determining LDR compliance. EPA has developed the UTS to reflect the performance of the BDAT technology. The "best" technology, in turn, is the one that minimizes threats to human health and the environment. The extent of such threats generally depends not on the instantaneous concentration and mobility of hazardous constituents in a specific waste sample, but on the concentration and mobility of hazardous constituents in an entire waste stream over time. For this reason, the proper indicator of environmental performance is composite sampling, rather than grab sampling, and compliance should be judged on this basis.

EPA is simply wrong when it claims that "[grab] sampling is in keeping with the ultimate objective of the land disposal restrictions program: that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose." 62 Fed. Reg. at 26,047. Instead, grab sampling focuses on the threats from a minute fraction of a total waste. Moreover, that small fraction is less likely from a statistical viewpoint to be representative of the waste as a whole.

By focusing on grab samples, rather than composite samples, EPA may very well be allowing treatment that does not minimize risks. Consider, for example, a treatment technology that generally reduces the concentration of a hazardous constituent to 1 ppm, but 10 percent of the time can only reduce the concentration to 10 ppm. This technology would clearly be better from an environmental perspective than a different technology that consistently achieves a concentration of 9 ppm. Yet, a focus on grab samples would lead EPA to conclude that the latter technology is "best." The result would be increased environmental loadings of the hazardous constituent by a factor of approximately 5.[fn10: The first technology would result in an average concentration of 1.9 ppm ((0.9x1.0)+(0.1x10.0)), while the second technology would result in an average concentration of 9.0 ppm, an increase by a factor of 4.74 (9.0/1.9).]

If EPA nevertheless persists in judging compliance with most LDR treatment standards on the basis of grab samples, AISI urges the Agency to at least allow composite sampling for all K061, K062, and F006 wastes. As EPA itself admits, the treatment standards for these waste streams were based in part on composite data. Thus, it would be inappropriate to require compliance on a grab sample basis. Moreover, EPA should not restrict the use of composite sampling to two facilities, as it has proposed to do. The Agency has always maintained that once the BDAT treatment standards are established for a waste, any technology that is capable of meeting the standards (including both the BDAT and other technologies) can be used on the waste. However, by requiring different sampling protocols for different facilities, EPA is effectively establishing different treatment standards for a single waste. This approach is a significant departure from prior EPA practice and could have the undesirable effect of favoring one treatment technology over another, without any environmental basis. To avoid this problem, EPA should allow all facilities (including those using both HTMR and stabilization technologies) to demonstrate compliance with the treatment standards based either on grab samples or composite samples.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

The BDAT scenario addressing two technologies where the first technology consistently, 90% of the time, reduces the concentration of hazardous constituents to 1.0 ppm, and the second

technology consistently reduces the concentration of hazardous constituents to 9.0 ppm, both based on grab sampling, the Agency would evaluate BDAT in the following manner. In determining BDAT optimization of a treatment technology (process) is evident in the reduction of hazardous constituents in the treated wastes. In determining process optimization we compare levels concentrations of hazardous constituents in both the untreated and treated wastes. In the evaluation of these two data results, after QA/QC, it would be determined that performance was not optimized by the second technology, due to some type of interference. If the treated waste results in a high level of hazardous constituents, it would establish that this technology has not been optimized, and the waste should be retreated. (See BDAT Background Document QA/QC Methodology dated June 23, 1991).

7. 2P4P-00041 Cyprus Amax Minerals Company

Cyprus Amax Minerals Company and its affiliates, including Cyprus Climax Metals Company, Cyprus Miami Mining Corporation, Cyprus Sierrita Corporation, Cyprus Bagdad Copper Corporation, Climax Molybdenum Company, Cyprus Foote Mineral Company and Amax Gold, Inc. ("Cyprus Amax"), submit these comments on the Notice of Proposed Rulemaking published by the U.S. Environmental Protection Agency ("EPA" or "the Agency") entitled "Land Disposal Restrictions Phase IV: Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill," 62 Fed. Reg. 26,041 (May 12, 1997), commonly referred to as the "Second Supplemental Phase IV proposal." Cyprus Amax is a diversified mining, mineral processing, and manufacturing company involved in the extraction, beneficiation, and processing of a variety of minerals and metals, including copper, molybdenum, coal, lithium, and gold.

VII. COMPLIANCE WITH LDR TREATMENT STANDARDS SHOULD BE BASED ON COMPOSITE SAMPLES, RATHER THAN GRAB SAMPLES.

EPA has proposed to require that compliance with the LDR treatment standards be generally demonstrated on the basis of grab samples, rather than composite samples. Cyprus Ama x strongly opposes the use of grab samples for determining LDR compliance.

EPA has developed the UTS to reflect the performance of the "best, demonstrated, available technology. The "best" technology, in turn, is the one that minimizes threats to human health and the environment. The extent of such threats generally depend not on the instantaneous concentration and mobility of hazardous constituents in a specific waste sample, but on the concentration and mobility of hazardous constituents in an entire waste stream over time. For this reason, the proper indicator of environmental performance is composite sampling, rather than grab sampling, and compliance should be judged on this

EPA is simply wrong when it claims that "[grab] sampling is in keeping with the ultimate objective of the land disposal restrictions program: that all of the hazardous waste to be land

disposed be treated in a way that minimizes the threats that land disposal could pose." 62 Fed. Reg. at 26,047. Instead, grab sampling focuses on the threats from a minute fraction of a total waste of grab samples can be substantially skewed by outlier conditions, sample contamination etc. Moreover, that small fraction is less likely from a statistical viewpoint to be representative of the waste as a whole. EPA should allow composite sampling to demonstrate LDR compliance.

Response

The land disposal restrictions (LDR) Program requires that all of the hazardous wastes to be land disposed be treated in a way that minimizes the threats that land disposal could pose. Compliance with LDR treatment criteria, being grab sampling, is based on the upper tolerance limit for the pollutant concentration of the waste population; Whereas composite sampling or average, is based on the upper confidence limit of the pollutant concentration of the waste. The LDR Program prefers grab sampling because it is designed to try to assure that at least 99% of the wastes hazardous pollutant concentration is below the limit. Because the LDR Program is technology based, and reduces the concentration of hazardous constituents being land disposed composite sampling, and averaging is unacceptable. (See Background Document BDAT QA/QC Methodology, dated October 23, 1991). In establishing treatment standards the BDAT Methodology is a statistical analysis that not only measures the reduction of hazardous constituent concentrations in the untreated and treated residuals, but also reasonably characterizes the range of treatment syste performance.

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

8. 2P4P-00048 National Mining Association

The National Mining Association ("NMA") is the industry association representing the producers of most of the nation's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment, and supplies; and the engineering and consulting firms, financial institutions and other firms serving the coal and hard rock mining industry. These comments are submitted in response to the Supplemental Notice of Proposed Rulemaking issued by the United States Environmental Protection Agency ("EPA" or "the Agency") entitled "Land Disposal

Restrictions Phase IV: Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill," 62 Fed. Reg. 26,041 (May 12, 1997), commonly referred to as the "Second Supplemental Phase IV" proposal.

Enclosed are the original and two copies of the comments of the National Mining Association on the Environmental Protection Agency's May 12, 1997, proposed rule: "Land Disposal Restrictions Phase IV: Second Supplemental Proposal on Treatment Standards for Metal Wastes and Mineral Processing Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill" (62 Federal Register 26041, May 12, 1997) ("proposed rule").

The National Mining Association (NMA) comprises the producers of most of the nation's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and the engineering and consulting firms, financial institutions and other firms serving the mining industry.

The May 12 proposed rule is a complex and far-reaching piece of rulemaking. Some of its major provisions include:

- prohibiting the use of non-virgin or "alternative" feedstocks in beneficiation and mineral processing operations;

- prohibiting land storage of most mineral processing secondary materials that are to be recycled;

- significantly narrowing the scope of the Bevill Amendment by altering the criteria for determining what is or is not a Bevill waste;

- seeking comment on "reexamining" earlier RCRA Regulatory Determinations not to impose RCRA hazardous waste regulation on extraction, beneficiation and 20 mineral processing wastes; and

- establishing land disposal restriction (LDR) treatment standards for mineral processing wastes not subject to the Bevill Amendment (i.e., "newly identified" mineral processing wastes)

Overall, the proposal is environmentally counterproductive, exceeds the agency's statutory authority, lacks virtually any support in the administrative record, and ignores the demonstrated expertise of the states in managing appropriate regulatory programs for this industry's waste management issues. The proposed rule's impacts on NMA's member companies, particularly those engaged in the extraction, beneficiation and processing of non-coal minerals, would be direct, significantly adverse, and totally

unwarranted.

XI. COMPLIANCE WITH LDR TREATMENT STANDARDS SHOULD BE BASED ON COMPOSITE SAMPLES, RATHER THAN GRAB SAMPLES.

EPA has proposed to require that compliance with the LDR treatment standards be generally demonstrated on the basis of grab samples, rather than composite samples. A grab sample is defined by EPA as a "one-time sample taken from any part of the waste." NMA strongly opposes the use of grab samples for determining LDR compliance.

EPA has developed the UTS to reflect the performance of the "best, demonstrated, available technology." The "best" technology, in turn, is the one that minimizes threats to human health and the environment. The extent of such threats generally depend not on the instantaneous concentration and mobility of hazardous constituents in a grab sample, but on the concentration and mobility of hazardous constituents in an entire waste strewn over time. For this reason, the proper indicator of environmental performance is composite sampling, rather than grab sampling, and compliance should be judged on this basis.

EPA is simply wrong when it claims that "[grab] sampling is in keeping with the ultimate objective of the land disposal restrictions program: that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose." 62 Fed. Reg . at 26,047. Instead, grab sampling focuses on the threats from a minute fraction of a total waste. Grab samples can be substantially skewed by outlier conditions, sample contamination, etc. Moreover, that small fraction is less likely from a statistical viewpoint to be representative of the waste as a whole. Grab sampling is a non-probabilistic process which always introduces unaccountable errors. EPA should provide that composite sampling be used to demonstrate LDR compliance.

Response

Compliance with the land disposal restrictions (LDR) Program treatment criteria, by grab sampling, is based on the upper tolerance limit for the pollutant concentration of the waste population; whereas composite sampling or average, is based on the upper confidence limit of the pollutant concentration of the waste. The LDR Program prefers grab sampling because it is designed to try to assure that at least 99% of the waste pollutant concentration is below the limit. (See Background Document BDAT QA/QC Methodology dated June 23, 1991).

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than

composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

9. 2P4P-00054 Kennecott

VII. Compliance with UTS Standards Should be Based on Representative Sampling.

EPA proposes that grab samples (as opposed to composite or representative samples) be used to judge compliance with the LDR'S. A grab sample is defined by EPA as a "one-time sample taken from any part of the waste." EPA attempts to justify this requirement in two ways:
First, because "grab samples normally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance," grab sampling is somehow construed to be in keeping with the ultimate LDR objective of minimizing the threat of land disposal, and
Second, grab sampling evokes an "implementation advantage" since enforcement can be based on individual sampling events by EPA, authorized states, or citizen groups.

Unless amended, EPA's grab sampling proposal will unjustifiably tighten the UTS criteria to which wastes must be treated and will deny the adoption of scientifically sound sampling protocol in preference to a sampling technique characterized by sampling experts as "a dangerous form of gambling." [FN 25 25Pitard, Francis. Pierre Gy's Sampling, Theory and Sampling Practice. Vol, II: Sampling, Correctness and Sampling Practice, CRC Press Inc., Boca Raton FL, 1989, pages 5-6.]

In Chemical Waste Management vs- EPA, the Court set aside arguments that EPA's decision to use grab samples to enforce LDR standards was vague and arbitrary by relegating sampling issues to individual facility disposal permits. Unfortunately, the Court placed a somewhat naive level of trust in EPA's ability to account for the inherent variability in waste materials and different sampling methods "by adjustment of sampling results to account for the inevitable variability of content." The Phase IV LDR proposal now offers EPA an opportunity to clarify this issue by specifically addressing the technical defensibility (as opposed to vagueness or arbitrariness) of grab sampling.

The proposed UTS levels are based on grab samples of HTMR and Stabilization wastes.

According to EPA, the demonstration of compliance with these proposed UTS criteria is, therefore, also to be based on grab samples of the treated waste. Missing from this argument is the fact that the initial determination of hazardous waste characteristics must be based on representative samples of the original waste. A continuous string of logic can only be preserved if the representativeness test is consistently applied, from initial hazardous determination, to UTS development, to compliance determination. This is particularly important for mineral processing wastes which are characterized by large volume, relatively low hazard, and variant composition (both in particle size and chemical content).

A technically permissible grab sample from a mineral sample containing particles of at least 1.25 inches in diameter exceeds 2000 pounds. [FN 26 Newton, J., An introduction to Metallurgy, John Wiley and Sons, Inc., London, page 464.] To impose this requirement on regulatory agencies or citizen groups seeking to determine compliance seems an unfair obligation. However, without defining an adequate (or permissible) sample size, or even imposing the Agency's own sampling guidance found in Chapter 9 of Test Methods for Evaluating Hazardous Waste, SW846, grab samples could arguably be construed to consist of only the 100 grams required for a TCLP test. If a grab sample weighing one pound is taken from a process treating 1000 tons per day of waste, the sample represents only 0.04 seconds of production. Based on the inherent variability of mineral processing wastes, combined with the stochastic variability of any treatment process, an unfair obligation to always and uniformly achieve the UTS criteria is placed on the treatment operator. The only way compliance could be achieved, so that "all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose," would be to design and operate treatment facilities to achieve average UTS levels far (perhaps orders of magnitude) below those proposed by EPA. [FN 27 Federal Register, Vol. 62, No. 91, page 26047, emphasis added.] Treatment processes are designed and operated to achieve average results within a specified degree of variance. If a waste treatment operation is to be evaluated on the basis of grab samples, 99% assurance that the UTS levels are being achieved in all portions of the treated waste will force the facility to operate at average levels significantly below those for which EPA has demonstrated feasibility. The very fact that UTS levels for these wastes are based on grab samples from HTMR and Stabilization processes invalidates any assurance that the proposed UTS levels can be achieved on either an average or maximum basis, or that UTS levels are not arbitrary and capricious.

In its simplest form, grab sampling is described in sampling literature "as taking small, equal portions by scoop or shovel at random or at regular intervals from the mass of material to be sampled. When the amount of material is large and heterogeneous in nature (e.g. mineral processing wastes), correct results can hardly be expected and it is more probable that samples would run regularly high or regularly low." [FN 28 Behre, H.E. Handbook of Mineral Dressing - Section 19, Sampling and Testing, John Wiley and Sons, NY, 1945, pages 24-25.] In no sense would the professional sampling community agree with EPA's definition that grab sampling is a "one-time sample taken from any part of the waste."

Grab sampling is a non-probabilistic process which always introduces unaccountable errors. "In other words, grab sampling delivers specimens not samples. Grab sampling was developed

when sampling was a primitive art practiced only by a limited number of initiates who failed to update their scientific knowledge. We definitely recommend to avoid them at any cost." [FN 29 Gy, Pierre M., Sampling, of Particulate Materials Theory and Practice, Elsevier Scientific Publishing Co. Amsterdam - Oxford - New York, page 33.] The errors incurred by grab sampling are usually large enough to deprive the samples of any practical value. [FN 30 Ibid.]

Proper and scientifically defensible decisions, whether they are to build and operate a waste treatment facility or to regulate the treated waste against a reasonable set of standards, can only be supported by relying upon representative samples. EPA should not depart from this concept (which is properly adopted in initially characterizing the wastes), for establishing LDR'S. The formal adoption of "grab sampling," especially as defined by EPA, is scientifically indefensible and imposes unfair and impractical obligations on both the regulated community and responsible citizen groups.

Response

The commenter is somewhat confused with grab sampling, and the number of samples required. Extent of sampling can be determined site-specifically, for example, in waste analysis plans. See 976 F. 2d at 31.

The proposed UTS levels are based on grab samples of HTMR and Stabilization wastes. Use of grab sampling does not meas that only onw sample is taken. A grab sample, as defined by EPA, as a one-time sample taken from any part of the waste. Grab sampling verifies consistency and/or optimization in the process. Compliance with the LDR treatment criteria, being grad sampling, is based on the upper tolerance limit for the pollutant concentration of the waste population; whereas composite sampling or average, is based on the upper confidence limit of the pollutant concentration of the waste. The LDR Program prefers grab sampling beause it is designed to try to assure that at leas 99% of the hazardous waste pollutant concentration is below the limit.

Treatment of the hazardous constituents prior to land disposal is preferred rather than allowing dilution of hot spots. (See BDAT Background Documtne QA/QC Methodology dated June 23, 1991)

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

As counsel for Macalloy Corporation ("Macalloy"), we are pleased to have this opportunity to comment on the United States Environmental Protection Agency's ("USEPA's") proposed

only remaining manufacturer of ferrochromium in the United States, Macalloy is in a unique position to address the impacts of these proposed regulations on mineral processing operations

the mineral processing industry as a whole, we will address these impacts and offer where appropriate, suggested modifications, additions or deletions the Phase IV Proposal which will not

the Hazardous and Solid Waste Management Amendments, [FN 1: For convenience, these two pieces of legislation will hereinafter be collectively referred to as RCRA.] but will also provide a

addressed its general objections to this. proposal under separate cover.

C.
COMPLIANCE DETERMINATIONS IS IMPROPER, UNSCIENTIFIC, AND CONFLICTS WITH EPA ANALYSIS OF DATA QUALITY

In the preamble, EPA states that individual grab samples, rather than composite samples or statistically reduced results from multiple samples, are to be used for determining compliance with

making such a compliance determination- is improper, unscientific, and in conflict with EPA guidance on sampling and analysis of solid waste streams and EPA guidance on data quality

process variability, and thus would reasonably characterize the range of treatment system performance. " However, in allowing compliance with LDR standards to be determined on the

analytical techniques. It is quite possible that analysis of a single grab sample which indicates that LDR standards have not been achieved could be the result of sampling error or analytical error

determinations to be made on the basis of a single grab sample contradicts EPA's diligent efforts in other areas to ensure that data quality objectives are identified and achieved.

The commenter is somewhat confused with grab sampling, and the number of samples required. Use of grab sampling does not mean that only one or a single grab is taken. A grab

consistency or optimization of the technology and the process.

Compliance with LDR treatment criteria, being grab sampling, is based on the upper

sampling because it is designed to try to assure that at least 99% of the waste pollutant concentration is below the limit. Therefore, since the LDR Program is interested in the upper

unacceptable. Treatment of the hazardous pollutant prior to land disposal is preferred rather than allowing dilution of hot spots. (See BDAT Background Document QA/QC Methodology dated

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples

over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system

June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land

composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

in its entirety to the required treatment standards, not that the waste be treated on an average basis. Consistent with this policy, the Agency has calculated treatment standards based on

treated wastes and not the average. By setting standards at the upper bound of performance, any random sample from adequately treated wastes should be found to be in compliance.

the promulgated standards. Treatment facilities must test their wastes according to the frequency specified in their waste analysis plans (40 CFR 268.7(b)). In developing the plan, verification

would require retreatment or additional treatment.

11. 2P4P-00068 Horsehead Resource Development Company, Inc.

the U.S. Environmental Protection Agency's ("EPA" or "Agency") Land Disposal Restrictions ("LDR") Phase IV supplemental proposed rule. 62 Fed. Reg. 26041 (May 12, 1997). HRD

is nation's largest recycler of electric arc furnace dust (KO61). HRD represents a substantial portion of the domestic recycling capacity for K061. Indeed, HRD provides an essential recycling

contributor to U.S. zinc production.

EPA's Phase IV proposal includes two major elements upon which HRD will comment. First, HRD will comment on EPA's proposal to modify the universal treatment standards ("UTS") for inorganic constituents in two respects, including changing the UTS levels and requiring use of grab sampling data as the basis for implementing and enforcing the UTS for K061, K062, and F006. Second, HRD will comment on EPA's proposed ban on "fill material.

EPA's Phase IV LDR supplemental proposed rule includes two proposals that EPA should reconsider. First, EPA should retain the composite sampling requirement for determining compliance with the inorganic UTS for K061, K062, and F006, since composite sampling provides more accurate and representative information on material composition, and the regulated community and EPA have successfully implemented and enforced the UTS on the basis of composite sampling for a number of years. Second, EPA should withdraw the proposed prohibition on a ll fill material, since the proposal in unnecessarily duplicative of other policies and regulations, ambiguous and unduly expansive, inconsistent with other Agency rulemakings, and without scientific basis. More specifically, HRD provides the following recommendations on the LDR Phase IV supplemental proposed rule:

•Should EPA proceed with the grab sampling protocol, the Agency must ensure that all major technologies, including HTMR, can achieve the revised UTS on the basis of grab sampling.

Proposed UTS Revisions

- EPA should retain composite sampling as the basis for compliance with the UTS for K061, K062 and F006. Grab sampling is technically unsound, since only composite sampling results in an accurate characterization of the material.
- Should EPA proceed with the grab sampling protocol, the Agency must ensure that all major technologies, including HTMR, can achieve the revised UTS on the basis of grab sampling.
- EPA's current plan for implementing the UTS will be impracticable to implement and unlawful. As explained below, the regulated community will be subject to UTS that are based on a mix of composite and grab sampling data, yet are implemented and enforced solely on the basis of grab sampling, which is contrary to EPA policy and unlawful.
- EPA should rectify this problem by continuing to allow compliance with the current UTS for K061, K062 and F006 on the basis of composite sampling until all relevant states have adopted all of the UTS.
- Alternatively, should EPA decline to extend the availability of composite sampling during the transitional period, EPA should determine that all of the revised UTS are more stringent than the current UTS, since grab sampling methodology is more stringent than composite sampling methodology. This would ensure that all of the new UTS are implemented concurrently.

HTMR's significant role in the development of the UTS is important because EPA has proposed to change the UTS in two respects that affect HTMR facilities. First, EPA proposes to

require that compliance with and enforcement of the revised UTS for inorganic constituents be based exclusively on grab sampling, even though composite sampling was used to develop most of the inorganic UTS, and composite sampling ensures accurate characterization of the material. Second, EPA proposes to change many of the levels for inorganic UTS, in large part to allow stabilization technologies to meet the UTS. As explained below, HRD recommends that EPA retain composite sampling as the basis for compliance with the current inorganic UTS, particularly for K061, K062 and F006. Should EPA nevertheless decide to revise the UTS, EPA should ensure that any changes (including changes to either the levels or the sampling basis) be achievable by all major technologies, including HTMR. HRD also explains that EPA's proposed changes to the UTS will be impracticable to implement, and unlawful, unless the Agency takes steps (explained below) to ensure consistent implementation of the UTS by requiring a single sampling methodology during the transition period for the proposed new UTS.

A. EPA Should Retain Composite Sampling as the Basis for Compliance with the UTS.

EPA should retain the composite sample requirement for K061, K062 and F006. As EPA has acknowledged, grab sampling does not provide accurate and representative information on material composition. In contrast, a composite sampling protocol ensures that the samples accurately reflect the material's composition. Indeed, EPA has established a general requirement for representative sampling, which is possible only through composite samples. As EPA explains in its sampling protocol manual (SW-846), " [the EPA, in its hazardous waste management system, has required that certain solid wastes be analyzed for physical and chemical properties..... [and] requires that representative samples of waste be collected and defines representative samples as exhibiting average properties of the whole waste. [FN2: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods § 9. 1. 1.1 (EPA Pub.SW-846 Third ed.).]

Despite EPA's assertion that it prefers grab sampling (62 Fed. Reg. at 26047), composite sampling is the basis for most of the existing inorganic UTS, which first became effective in 1988. EPA and the regulated community have implemented and enforced composite sampling since that time without any environmental issues or implementation problems. Composite sampling also is consistent with the sampling requirements contained in most waste analysis plans of companies subject to regulation under RCRA. Moreover, EPA requires and/or encourages composite sampling in many situations where representative sampling is performed for verification against particular EPA specifications and standards. For example, EPA delistings require composite sampling to verify compliance with the exclusion. [FN3: 1 E.g., 58 Fed. Reg. 6925, 6933 (Feb. 3, 1993); 57 Fed. Reg. 37927, 37935 (Aug. 21, 1992).]

Finally, no environmental issues have arisen from the use of composite sampling to determine compliance with the UTS. Accordingly, EPA should allow use of composite sampling data to determine compliance with the UTS.

B. The UTS Must Be Achievable by all Major Technologies.

Should EPA nevertheless choose to revise the UTS, and to require grab sampling as the basis for compliance with them, it must ensure that all major technologies can achieve the revised UTS on the basis of grab sampling. This prerequisite is consistent with EPA's explicitly stated policy that the UTS be "achievable by all of the major HTMR technologies." 56 Fed. Reg. 41164, 41169 (Aug. 18, 1991) (K061 standards). Inconsistently, however, EPA states in the Phase IV LDR proposal that "it appears that with the new UTS levels proposed in this notice, . . . HTMR facilities should be able to meet UTS on a grab sampling basis. " 62 Fed. Reg. at 26047. EPA is not currently in a position to state that all major technologies and facilities are able to meet the UTS on the basis of grab sampling data. Given EPA's stated objective that all major technologies meet the treatment standards, promulgating the proposed UTS without a demonstration that all major technologies can meet the standards would be arbitrary and capricious.

Response

The commenter is somewhat confused with grab sampling, and the number of samples required. Use of grab sampling does not mean that only one or a single grab sample is taken. A grab sample as defined by EPA, is a one-time sample taken from any part of the waste, thereby verifying consistency or optimization of the pppprocess.

Compliance with LDR treatment criteria, being grab sampling, is based on the upper tolerance limit for the pollutant concentration of the waste pollutant; whereas composite sampling or average, is based on the upper confidence limit of the pollutant concentration of the waste. The LDR Program prefers grab sampling because it is designed to try to assure that at least 99% of the waste pollutant concentration is below the limit. Therefore, since the LDR Program is interested in the upper bound of the pollutant concentration, composite sampling, an averaging technique, is unacceptable. Treatment of the hazardous pollutants ppprior to land disposal preferred rather that allowing dilution of the hot spots.
(See BDAT QA/QC Methodology Background Document, dated October 23,1991).

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

This commenter submitted some 152 data point based only on grab sampling. Of these, 100% showed complaince with the proposed metal standard after removal of the high statistical outliers. Indeed the great majority of the data submitted showed as much as an order of magnitude below

the promulgated standard. (See Phase IV Final rule Background Document, Memorandum dated December 17, 1997 and data evaluation of the Horsehead Research Development grab data submittal of 152 data points). Horseheads own data corrobarates the Agency proposed standards.

In addition, EPA has revised the treatment standards for antimony, beryllium, cadmium, chromium, nickel, and silver. Treatment standards for antimony, beryllium, and silver were revised based on new data provided by commenters, that represented the "most difficult to treat" wastes. Thus, the Agency is promulagting revised UTS for antimony, beryllium, and silver at 1.15 mg/l, 1.22 mg/l, and 0.14 mg/l respectively. For cadmium, chromium, and nickel, the Agency has identified a technical error in the BDAT determination of the proposed standards. In applying the BDAT methodology for calculating the treatment standard, EPA failed to perform a "Z-score" outlier test. The Agency corrected this error and has re-calculated the treatment standards for cadmium, chromium, and nickel at 0.11 mg/l, 0.60 mg/l, and 11 mg/l respectively. Although these standards are more stringent than the proposed standards, based on the treatment performance data reviewed, the Agency believes that these new standards are also achievable by commercial treatment technologies such as stabilization and HTMR. (See the BDAT background materials in the docket for today's rule, for additional information on the revised treatment standards.)

12. 2P4P-00069 Macalloy Corporation

The proposed rule requires that grab sampling shall be used instead of composite sampling when analyzing for compliance with the LDR standards. Yet it excludes certain wastes (K061, K062, and F006) since composite data was used instead of grab sampled data for the creation of the current treatment standards. What kind of data was used for D007? This aspect of the proposed rule not only contradicts but invalidates the U.S. EPA authored Test Methods for Evaluating Solid Waste - SW 846, Chapter 9. By using the analysis from a grab sample instead of a composite sample, the technique cannot account for unexplained data anomalies. SW 846 Chapter 9 explains that "It is important to emphasize that a haphazardly selected sample is not a suitable substitute for a randomly selected sample. That is because there is no assurance that a person performing undisciplined sampling will not consciously or subconsciously favor the selection of certain units of the population, thus causing the sample to be unrepresentative of the population". One of the reasons stated for requiring grab sampling is because "there is an implementation advantage to use of grab sampling, since enforcement for EPA, authorized states. or citizen groups is facilitated if enforcement can be based on individual sampling events (as occurs with grab sampling)". SW 846 Chapter 9 goes on to say that "accuracy is achieved by incorporating some form of randomness."

Response

The Agency notes that all the UTS for TC metals, including chromium (D007), promulgated in today's rule are based on treatment performance data obtained from grab samples. In addition, the Agency has identified a technical error in the BDAT determination of the proposed chromium

standard. In applying the BDAT methodology for calculating the treatment standard, EPA failed to perform a “Z-score” outlier test. The Agency corrected this error and re-calculated the chromium treatment standard and is promulgating the UTS for chromium at 0.60 mg/l TCLP. Although this standard is more stringent than the proposed standard, based on the treatment performance data reviewed, the Agency believes that this new standard is also achievable by commercial treatment technologies such as stabilization and HTMR.

With respect to the comment of sampling, the Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

13. 2P4P-00075 United States Department of Defense (DoD)

DoD Comment - DoD opposes the use of grab sampling to determine compliance with LDR treatment standards. As noted in the preamble, EPA's current approach considers any single grab sample excedence of a standard to be a violation, rather than basing violation determinations on an average or composite sampling. DoD is concerned that this enforcement approach is overly stringent and is inconsistent with the concept of "representativeness" that is the basis for other sampling and analysis requirements in the RCRA program. In the preamble to the HWIR proposed rule (60 FR 66344), EPA addresses a similar issue concerning sampling to determine compliance (pages 66386-66387). In that discussion, EPA acknowledged. that a composite sample could be used to determine an excedence of a standard (in that case, an "exit level"):

EPA believes it is important to retain the practical approach whereby a single composite sample of a waste at some arbitrary point in time or space during a short visit is considered sufficient for enforcement purposes. (60 FR 66387; emphasis added)

EPA's stringent approach may also serve as a disincentive to voluntary contamination clean up efforts. Contamination in soil and other media generated through remediation may be highly variable. Concern that large amounts of treated soil could be deemed as exceeding the treatment standard because of one grab sample might discourage some clean-up efforts that would otherwise provide a net benefit to the environment.

Even if use of a composite sample failed to show an excedence of a treatment standard

somewhere in the waste stream, the excedence would represent only a small portion of the overall waste stream. The presence in a landfill of such a minor amount of waste above the treatment standard would not pose a threat to human health or the environment, since any liquid passing through the landfill cell would not concentrate on that particular portion of the waste.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

14. 2P4P-0L003 Environmental Technology Council

The Environmental Technology Council (ETC) is a national trade association of firms engaged on a commercial basis in the recycling, treatment, and disposal of hazardous and industrial wastes. The Council's member companies provide high-technology methods for the safe and effective treatment, reclamation and disposal of waste materials; remedial response at uncontrolled waste sites; and waste treatment equipment. The Council has been actively involved in every major LDR rulemaking since the inception of this regulatory program. Council members provide incineration, treatment, and stabilization services that will be directly affected by the issues raised in this LDR Phase IV supplemental proposal.

6. COMPOSITE VERSUS GRAB SAMPLE TO DEMONSTRATE LDR COMPLIANCE

The ETC feels that for practicality's sake, EPA should revisit its position on grab samples versus composite samples as the basis for LDR treatment standards. EPA maintains that grab sampling is required to demonstrate compliance with LDR standards. The Council feels strongly that composite samples are better indicators of compliance and a more accurate basis for setting treatment standards.

Historically, EPA has maintained that a number of grab samples taken from a continuous process stream over a period of time will give better information for calculating process variability than a composite sample of the same process over the same period of time. However the EPA should consider that LDR compliance for the treatment of waste streams that are not uniform in their physical and chemical properties is best determined by composite sampling. Reliance on a

grab sample taken from a common point in the process is less representative of the treatment residue than a composite sample taken from a number of points that represents a cross-section of the process stream.

This is particularly true for "dewatered.' sludges, incinerator ash, debris, and other mixtures of solids that are typically handled and processed in batches rather than continuously flowing streams. Considering that most waste material destined for landfill disposal will be transported in a roll-off box or similar transportation equipment, representative sampling requires taking individual samples of the material from different sections of the container. These samples are then composite into a single sample to fairly represent the waste stream in the container. Analysis of each separate sample that comprises the composite does not adequately tell the final treatment operator if the waste stream meets LDR standards or how the waste stream will respond to treatment if it doesn't already meet standards. Only the analysis of a representative composite sample provides this information to the treater or land disposal facility.

In the past, EPA has maintained that grab sampling is required for the purposes of enforcement. While ETC understands the Agency's position in this area, we feel it should not preclude the use of composite samples to demonstrate LDR compliance. Scientific validity, not legal simplicity, should be the basis for establishing waste treatment standards and compliance with them.

Response

The Agency prefers that compliance with LDR standards for nonwastewaters be based on grab samples (a one-time sample taken from any part of the waste), rather than composite samples (a combination of samples collected at various locations for a given waste, or samples collected over time from that waste). The Agency believes that grab samples generally reflect maximum process variability, and thus would reasonably characterize the range of treatment system performance. (See discussion on this issue at 54 FR 26605, June 23, 1989 and 55 FR 22539, June 1, 1990). The grab sampling also meets the ultimate objective of the LDR program, that all of the hazardous waste to be land disposed be treated in a way that minimizes the threats that land disposal could pose, not just the average portion of the waste to be so treated (a possible use of composite sampling). In addition, since grab sampling is based on individual sampling events, it facilitates enforcement proceedings for EPA and authorized states.

1. 2P4P-00048 National Mining Association

New Information on the Inappropriateness of Applying the Toxicity Characteristic to Mineral Processing, Wastes:

EPA has not expressly requested comments on applying the RCRA Toxicity Characteristic (TC) to mineral processing wastes. Nonetheless, new developments have occurred since EPA's January 25, 1996 proposal to reapply the TC to mineral processing wastes. In deciding whether to make that proposed rule final, EPA must consider these new developments, including EPA's final military munitions rule and the D.C. Circuit's decision in Dithiocarbamate Task Force v. EPA (98 F. 3d 1394, 1996).

As NMA's comments make clear, in light of these new developments there can no longer be any doubt that EPA should abandon its misguided efforts to apply the TC to mineral processing wastes. Instead, the Synthetic Precipitation Leachate Procedure (SPLP), modified as suggested in NMA's comments, should be used to evaluate the hazardousness of wastes from the mining and mineral processing industry.

XIV. THE TOXICITY CHARACTERISTIC CANNOT BE APPLIED TO MINERAL PROCESSING WASTES.

NMA recognizes that application of the Toxicity Characteristic ("TC") to mineral processing wastes is not one of the issues that EPA has explicitly requested comments on in its May 12, 1997 proposal. However, a number of recent developments have occurred that the Agency must take into account as it decides whether to finalize its January 25, 1996 proposal to reapply the TC to mineral processing wastes. These developments include the decision of the U.S. Court of Appeals for the District of Columbia Circuit in Dithiocarbamate Task Force v. EPA, 98 F.3d 1394 (D.C. Cir. 1996), and the final military munitions rule promulgated by EPA on February 12, 1997, 62 Fed. Reg. 6622. The relevance of these developments to the current rulemaking is discussed below.

A. EPA Must Consider the Full Range of Factors Relating to the Potential Hazardousness of Mineral Processing Wastes, Not Just Waste Mismanagement Scenarios.

In proposing to apply the TC to mineral processing wastes, EPA has focused exclusively on one issue -- whether the mismanagement scenario that underlies the TC is plausible for such wastes. 61 Fed. Reg. 2338, 2354 (Jan. 25, 1996). The statute and EPA's own regulations, however, require more. Because the Agency has not considered all of the required factors, it cannot finalize its proposal.

The D.C. Circuit in Dithiocarbamate Task Force held that, in deciding whether to designate a waste as hazardous, EPA must consider a broad range of factors. Although this conclusion was reached in the context of listing hazardous wastes, it applies equally to the identification of hazardous waste characteristics. The statute itself provides that EPA's identification and listing decisions must "take] into account toxicity, persistence, and degradibility in nature, potential for accumulation in tissue, and other related factors." 42 U.S.C. § 6921 (a). EPA has specified at least some of these other factors in its regulations. See 40 C.F.R. § 26 1.1 I (a)(3).

Although the full list of factors is set forth in a provision relating to hazardous waste listings, the D.C. Circuit noted that "the very question that the ten factors ... are supposed to help answer" is whether the particular wastes meet the statutory definition of hazardous waste. Dithiocarbamate at 1400. Because that definition applies to wastes that are designated as hazardous by characteristic, as well as by listing, the full list of factors clearly applies to both identification of characteristics and listing of hazardous wastes.

EPA itself has recognized this fact since the very beginning of the hazardous waste regulatory program. In 1980, the Agency explicitly rejected certain characteristic tests because "it questioned whether these tests sufficiently took into account the multiple factors which bore on the question of the hazardousness of [the] wastes." 45 Fed. Reg. at 33,105 (May 19, 1980). EPA, in fact, acknowledged that it was more important to consider a broad range of factors when identifying a hazardous waste characteristic than when listing a waste. According to the Agency:

The identification mechanism has its limitations and must be used with considerable care. First and foremost, this mechanism must only employ characteristics which, in and of themselves, sufficiently define the properties of a waste that cause the waste to meet the definition of hazardous waste prescribed in Section 1004(5) of RCRA. In other words, a solid waste that possesses the property or properties described in an established characteristic must meet the statutory definition of hazardous waste without consideration of any other properties of or factors about the waste or its constituents. When properties or factors outside those defined in the characteristic must be considered to reach a determination that a waste meets the statutory definition of hazardous waste, a characteristic is not sufficient for the purpose of designating a hazardous waste.

Criteria Background Document at 16. [FN 23: EPA explained that one of the main reasons for requiring all factors to be fully considered in identifying a characteristic is that the characteristic mechanism, unlike the listing mechanism (which includes a delisting procedure), provides "no opportunity" for generators to "demonstrate ... that their waste is in fact not hazardous." 45 Fed. Reg. at 33,107. Instead, "the test prescribed in the characteristic constitutes a final determination of hazard." Id. Moreover, wastes that otherwise would have to be listed based on consideration of all the specified factors can be listed solely on the grounds that they exhibit a characteristic. See 40 C.F.R. § 261.11(a)(1).The only way to ensure that the characteristics do not become a means for circumventing the listing factors is to require those factors to be considered in the

identification of the characteristics.] Applying this principle in practice, EPA placed more of an emphasis on at least two factors (i.e., waste constituent migration and subsequent environmental fate) when developing the hazardous waste characteristics than when developing the hazardous waste listings. See 45 Fed. Reg. at 33,107.

EPA cannot now read the criteria for identifying hazardous waste characteristics in a different way, because doing so would make those criteria unlawful. In the absence of the factors, EPA's criteria for the hazardous waste characteristics would do little more that parrot the statutory definition of hazardous waste. Compare 40 C.F.R. § 261.10(a)(1) with 42 U.S.C. § 6903(5). However, the mere articulation of the statutory definition of hazardous waste as the basis for identifying a characteristic would be circular and would constitute an abrogation of EPA's statutory duty to establish criteria for characteristics which expand on the statutory definition. See 45 Fed. Reg. 33,106 (citing with approval comments that made this point in the context of the listing criteria). Moreover, this approach would fail to take into account the factors that are specifically mentioned in the statute. Id.

Clearly, EPA is required to consider the full range of factors specified in 40 C.F.R. § 26 1.1 I (a)(3) when identifying a hazardous waste characteristic. Because the Agency has only considered a single factor (i.e., mismanagement scenarios) in its proposed rule to apply the TC to mineral processing wastes, it cannot go forward with the proposal. [FN 24: EPA also cannot rely on past consideration of the factors when the TC was first developed. As an initial matter, it is not clear that the factors were properly considered in the earlier rulemakings. Moreover, many of the factors may have changed since the time of those rulemakings (i.e., other regulations affecting mineral processing wastes may have been amended, and scientific knowledge about the migration of constituents in the environment may have improved).] If EPA plans to remedy its effort and consider the full range of factors before issuing a final rule, it must provide the public notice of and an opportunity to conunent on the Agency's analysis of the factors, as required by the Administrative Procedure Act.

B. EPA Has Failed to Consider Properly the Plausible Management Scenarios for Mineral Processing Wastes.

Not only has EPA failed to consider virtually all of the requisite factors in determining whether to apply the TC to mineral processing wastes, but it also has failed to consider properly the one factor that it did address -- mismanagement scenarios. In Dithiocarbamate Task Force the D.C. Circuit declared that "EPA seems to have turned the mismanagement factor upside down, from an inquiry into whether dangerous management practices are 'plausible' ... into an inquiry into whether they have been ruled out absolutely." 98 Fed. Reg. at 1405. The Agency is making precisely the same error in attempting to apply the TC to mineral processing wastes.

The TC is premised on the assumption that the wastes being evaluated under the characteristic will be disposed in a municipal solid waste ("MSW") landfill. In an effort to manufacture a rationale for applying the TC to mineral processing wastes, EPA has searched extensively and

come up with only a few alleged examples of what it refers to as "likely," "possible," or "potential" cases of co-disposal with municipal wastes. As NMA noted in its comments on the January 25, 1996 Supplemental Phase IV proposal, however, none of EPA's alleged examples demonstrate that co-disposal has ever taken place. For that reason, EPA cannot apply the TC to mineral processing wastes.

Moreover, EPA's efforts to find a few cases where mineral processing wastes have been disposed in MSW landfills are completely misguided, because even if such cases exist they would not justify application of the TC to mineral processing wastes. The D.C. Circuit made clear in Dithiocarbamate Task Force that a mismanagement scenario is not "plausible" just because it has not been "ruled out absolutely." 98 FR at 1405. The Court explicitly recognized that "complete certainty is not possible." Id. at 1404.

According to the D.C. Circuit, "one should bear in mind that the ultimate question ... is whether [a] waste poses a 'substantial' hazard in light of the various possibilities of improper management." 98 F.3d at 1400; See also Criteria Background Document at 54 ("The Agency ... recognizes that it must be reasonable in selecting the [mismanagement scenario]; the statute requires that the potential hazard posed by the waste be substantial before a waste is hazardous"). Since the beginning of the RCRA regulatory program, EPA has acknowledged that "[hazards] arising from wholly unrealistic or improbable waste management ... are not substantial." Criteria Background Document at 54. For this reason, the Agency has concluded that "a scenario of improper management has to be developed for each waste, based upon the types of management the waste could normally undergo. ... In all cases, the scenario should be one that is reasonably possible or plausible, not one that very rarely would occur or is otherwise] unrealistic." Id. at 54-55 (emphasis added). [FN 25: EPA similarly stated that "the Agency would not examine possible hazards arising from improper waste incineration if the waste in question is not likely to be incinerated." 45 Fed. Reg. at 33,113 (emphasis added).] Clearly, a few isolated examples of disposal of mineral processing wastes in an MSW landfill (if they indeed do exist) would not justify application of the TC to mineral processing wastes under the Dithiocarbamate case and EPA's past practices.

Indeed, applying the TC in such a manner would run afoul of the Dithiocarbamate Task Force decision in another WAY. The Court in that case stated that:

Where it is reasonable to consider the factors in relation to a class of chemicals, EPA may do so. ... [That means essentially that if the known similarities of members of a class are such that it is reasonable to infer the presence of a disputed characteristic throughout the class (not just among the members for which it has been shown), the EPA is free to draw that inference.

98 F.3d at 1399. In the present case, EPA is distorting this standard beyond recognition. According to EPA, as long as it can demonstrate (or at least allege) that one particular type of waste has been managed in a certain way on one occasion, the Agency is free to assume, without more, that all mineral processing wastes may always be managed in that same way. Clearly, this is

not what the Court had in mind.

The D.C. Circuit also stated that "[where EPA is confronted with evidence challenging its classification, it must respond, either by altering its classification or by reasonably defending its choices." Id. at 1402. In the present case, perhaps the strongest evidence that it is inappropriate to apply the co-disposal mismanagement scenario to mineral processing wastes is the fact that EPA, despite considerable effort, has only been able to muster a few wholly deficient allegations that co-disposal has ever taken place. Assuming, for the purposes of argument only, that EPA can somehow identify a few true examples of co-disposal, the Agency must limit application of the TC to those few situations. Alteratively, EPA must show that it is reasonable to infer that other mineral processing wastes will also be co-disposed. Such a showing, however, will be extremely difficult, if not impossible, to make.

C. EPA Should Adopt a Modified SPLP, Rather than the TCLP, to Evaluate Mineral Processing Wastes,

One of the key problems with mechanically applying the TC that was designed for general industrial wastes to mineral processing wastes is the leaching test that is used under the existing characteristic, the TCLP. [FN 26: As NMA noted in its comments on the January 25, 1996 Supplemental Phase IV proposal, the regulatory levels that are used under the TC to evaluate the TCLP extract from a waste and thereby determine whether the waste is hazardous (See 40 C.F.R. § 261.24, Table 1) are also problematic. NMA maintains that these levels are unlawful, whether the TCLP or the (modified) SPLP is used as the leaching procedure.] As discussed in NMA's comments on the January 25, 1996 Supplemental Phase IV proposal, the TCLP is overly aggressive with regard to certain metals and waste types, thereby resulting in inflated leachability results. Much more accurate results (ie., results that reflect more closely the actual degree of leaching that is likely to occur in the environment) can be obtained with the SPLP, with certain specified adjustments to the particle size requirements in that test.

Because the modified SPLP is more accurate than the TCLP with respect to mineral processing wastes, it must be adopted by EPA for such wastes. Congress in 1984 specifically directed the Agency to "make changes in the [toxicity characteristic], including changes in the leaching media, as are necessary to insure that it accurately predicts the leaching potential of wastes which pose a threat to human health and the environment when mismanaged." 42 U.S.C. § 6921 (g) (emphasis added). In fact, EPA's own regulations require the Agency to adopt the testing method that is "superior ... in terms of sensitivity, accuracy, and precision (i.e., reproducibility)." 40 C.F.R. § 261.21(a). [FN 27: Under the regulations, if the two testing methods are "equal to" one another in terms of sensitivity, accuracy, and precision, both methods must be approved. See 40 C.F.R. § 261.21 (a). In such an event, generators can use either test method to demonstrate whether their wastes are hazardous] Because both the TCLP and SPLP have been developed by EPA, utilize the same analytical methods, and have been used by the Agency in various regulatory contexts, they should be comparable in terms of sensitivity and precision. Because the SPLP is more accurate than the TCLP for mineral processing wastes,

however, EPA must adopt the SPLP for such wastes.

At most, the TCLP should be used in those cases (if any) where mineral processing wastes are actually co-disposed in MSW landfills. As discussed in detail in its comments on the January 25, 1996 Supplemental Phase IV proposal, NMA would support a contingent management approach in which the leaching test to be applied to a mineral processing waste would depend upon the type of landfill in which the waste is disposed.

EPA's recent rule on military munitions provides legal support and precedent for just such an approach. In that rule, EPA conditionally excluded from the definition of hazardous waste military munitions that are stored in accordance with the standards of the Department of Defense Explosives Safety Board ("DDESB"). See 40 C.F.R. § 266.205(a). EPA based its approach on its "belief that RCRA section 3001 (a) provides the Agency with the flexibility to consider good management practice in determining the need to regulate waste as hazardous." 62 Fed. Reg. at 6636. EPA acknowledged that "in the early 1980's its interpretation of RCRA's definition of hazardous waste focused on the inherent chemical composition of the waste, and assumed that mismanagement of such waste would occur and would result in threats to human health or the environment." Id. at 6637. Based on its many years of experience with the management of hazardous wastes, however, "EPA believes that it is no longer required -- nor is it accurate or fair -- to assume that all inherently hazardous wastes will be mismanaged, thus creating the necessity to regulate them under subtitle C. " Id. Instead, wastes can be conditionally excluded from the definition of hazardous waste in those instances where they are managed in a protective manner.

NMA wholeheartedly agrees with EPA that RCRA provides the Agency authority to make the regulatory definition of hazardous waste contingent on the way that wastes are actually managed. Indeed, NMA believes that the statute may require such a "contingent management" approach, in order to ensure that only those wastes as generated that meet the statutory definition of hazardous waste are subjected to the management requirements of Subtitle C. NMA also agrees with EPA that it is neither accurate nor fair to assume that wastes will be mismanaged if they are not, in fact, being mismanaged. As the D.C. Circuit held in Dithiocarbamate Task Force, such an assumption would be arbitrary and capricious.

These conclusions are no less true in the case of mineral processing wastes than they are in the case of military munitions. Accordingly, to the extent that EPA decides to apply the TC to mineral processing wastes at all, it must do so only in those circumstances where the wastes are actually managed as assumed under that characteristic (i.e, disposed in an MSW landfill). In other cases, EPA should adopt the SPLP as modified per NMA's suggestion.

Response

For EPA’s response to this issue, see RCRA Docket # F-98-2P4F-FFFFF *Response to Comments Document,* Volume 14: Comments Related to Second Supplemental Proposed Rule (May 12, 1997): Treatment Standards for Metal Wastes and Mineral Processing

Wastes, Mineral Processing and Bevill Exclusion Issues, and the Use of Hazardous Waste as Fill
Land Disposal Restrictions--Phase IV: Final Rule Promulgating Treatments Standards for Metal Wastes and Mineral Processing Wastes; Mineral Processing Secondary Materials and Bevill

Preserving Wastewaters. (April 30, 1998).

2. 2P4P-00074 New York State Department of Environmental Conservation

Conservation (DEC) on the proposed supplemental Land Disposal Restriction (LDR), Phase IV Rule, published in the May 12, 1997 _____.

DEC supports the delegation of authority to states for certain aspects of the LDR. New

continuing effort to improve and update the LDR and associated hazardous waste programs, EPA may wish to consider delegating authority to states with approved LDR programs for at least

program has its base in the ability of regulatory agencies to quickly and efficiently administer the program. This will improve compliance and expedite environmentally safe solutions to hazardous

We appreciate the opportunity to participate in this rulemaking process. If there are any questions, please contact Normart H. Nosenchuck, Director of our Division of Solid &

published in the May 12, 1997 Federal Register
standards for metal wastes and mineral processing wastes. It also addresses mineral processing, Bevill exclusion issues and the use of hazardous waste as fill material.

data used in setting treatment standards is not all inclusive. DEC would caution against an approach which sets standards, based on limited waste matrices that may not fully represent

inequitable and overregulate certain wastes and generators. DEC agrees with EPA that revising standards should be ongoing and reflective of "new" data, but increasing stringency should, at this

exceeded. As an example, DEC would disagree with the lowering of the Universal Treatment

proposed UTS (0.11 mg/1) in relationship to health-based risks and environmental mobility. EPA also believes that most silver wastes are recycled and, therefore, are not land disposed, and yet

be able to achieve a particular level of treatment, this should not dictate whether or not a standard is needed to protect human health and the environment. DEC does not believe that statutory

mandates are best served by such overregulation. The current UTS for nonwastewater silver wastes (0.30 mg/l by TCLP) is sufficiently protective in light of economic incentives for recycling silver and statistically established low toxicity.

2. Proposed Treatment Standards for Mineral Processing Wastes

DEC agrees with EPA that mineral processing wastes should be subject to LDR treatment standards as proposed, previous comment excepted.

Response

In today's final rule, EPA is promulgating a nonwastewater treatment standard of 0.14 mg/l TCLP for both the characteristic and listed silver (D011) constituents. For wastewaters, EPA is promulgating a treatment standard of 0.43mg/l as proposed in the original Phase IV proposal on August 22, 1995 (60 FR 43684). The Agency is aware of the issues surrounding the recycling of silver therefore, EPA is currently is the process of determininig whether silver should be altered or revisited to determine whether silver should be on the TC list.

Phase IV Second Supplemental Proposed Rule:
Comments and Responses on Ignitable, Reactive, and/or Corrosive (ICR) Wastes

1. 2P4P-00081 Eastman Chemical Company

As stated previously, Eastman's Tennessee facility operates two rotary kilns and a liquid chemical destructor under a RCRA permit issued in 1989. These units manage both hazardous and nonhazardous incinerable wastes. Because many of the manufacturing processes generate corrosive D002 wastes which are managed in these incineration units, it is necessary for Eastman's to demonstrate compliance with underlying hazardous constituent UTS before the ash from the combustion of these decharacterized corrosive wastes can be land disposed. There are approximately 80 approved waste streams at this facility, which are acetic liquid waste steams. Many of these waste streams have as many as 40 analyses in the database for antimony. Using SW-846 Method 601 0, more than 99% of the data for these streams show values lower than the detection limit in the data system. For these highly organic waste streams, the detection limits range from 1.28 mg/l to 2.0 mg/l which is below the current UTS of 2.1 mg/l. Again, these detection limits are based on an extensive analytical testing program for multiple wastes and waste matrices. In addition, incinerator ash samples yield antimony TCLP values ranging from 0.016 mg/l to 1.3 mg/l which is again below the current UTS. However, neither database is adequate to demonstrate compliance with the proposed UTS of 0.07 mg/l.

Response

In response to comments regarding the treatability difficulties associated with antimony, the Agency reviewed additional data submitted by the commenters in response to the second supplemental Phase IV proposed rule. The Agency has determined that the antimony treatment standard (0.07 mg/l) proposed in the second supplemental Phase IV proposal (62 FR 26041, May 12, 1997) does not represent BDAT with a "most difficult to treat" waste. Therefore, the Agency has re-calculated the BDAT treatment standard for antimony at 1.15 mg/l based on newly obtained treatment performance data from Waste Management, Inc., that represented the "most difficult to treat" waste. The Agency believes that the new antimony standard can be achieved through well operated commercially available stabilization and HTMR technologies, and can be measured reliably be existing analytical procedures. The Agency notes that SW-846 Method 704 achieves detection limits of 0.003 mg/L via GFAA, 0.2 mg/L via FAA, and 0.032 mg/L via ICAP. The Agency also would like to note that if a particular waste is unique or possesses properties making it difficult to treat, the affected party may petition the Agency for a treatability variance as per 40 CFR 268.44 on a case-by-case basis.

2. 2P4P-00088 FMC Corporation

The starting point for this capacity determination is the understanding that the composition

Slurry, Precipitator Slurry, and Phossy Water -- is identical to the three waste streams for which EPA has proposed an NCV in all respects that are relevant to national capacity determinations.

identified streams contain varying amounts of both naturally occurring radioactive materials (NORM) and elemental phosphorous. Like the three waste streams addressed in the original

Toxicity Characteristic (TC) [FN 6: 40 C.F.R. º 261.24.] in the event of process upsets due to the presence of heavy metals. In addition, they all contain a variety of other metals, albeit below TC

streams are defined as non-wastewaters[FN 7: In 40 C.F.R. º 268.2, EPA defines a non-wastewater to be wastes that do not meet the criteria for wastewaters. Wastewaters are wastes

weight total suspended solids (TSS).] under the LDR program.

FMC is applying the D001 and D003 waste codes for the ignitable and reactive

demonstrate the presence of these characteristics. These waste characteristic determinations are contrary to those FMC previously made. These determinations and other information FMC has

FMC is prepared to manage these wastes as ignitable and reactive as part of an overall RCRA compliance program. That FMC will manage these streams as if these characteristics apply does

are accurate or appropriate.

Response

waste. These wastes are D001 because the phosphorus is capable of causing fire through spontaneous chemical changes and D003 because they generate phosphine - a toxic gas vapor or

managing these wastes, FMC should take adequate precautions to avoid worker injury.

(See Phase IV Final Rule Background Document Land Disposal Restrictions TC Metals and

DCN PH4P010
COMMENTER Coalition on West Valley
RESPONDER AC
SUBJECT RADI
SUBJNUM 010

COMMENT

The Coalition is, and always has been, opposed to burial of radioactive material of any kind. Experience at West Valley mirrors experience at other sites; radioactive waste has not been isolated by burial. Although burial technology could be improved and might slow down the migration, it will not eliminate it.

We oppose the proposed exemption of West Valley Demonstration Project wastes from the proposed Land Disposal Restrictions for burial of mixed waste. At West Valley 21,000 drums have already been filled with cemented mixed waste but not yet disposed of. These drums do not meet the proposed new restrictions. Since retreatment of those wastes to meet the new standard (opening the drums and grinding the cement) would pose a significant risk, EPA proposes that they be exempted from the new restrictions. We agree that retreatment is not a reasonable option. But to us the burial of waste which does not meet the new standards is not reasonable either. Therefore it should not be exempted from the restrictions. If these restrictions are necessary to protect the environment from contamination then they should be met unconditionally. I am not clear as to whether your LDRs consider above-ground tumulus disposal as burial, but we do consider a tumulus to be burial.

RESPONSE

The Agency notes that radioactive mixed wastes are subject to dual regulation. Thus, radioactive wastes mixed with metal characteristic waste have to comply with the LDR treatment standard for the metal characteristic wastes established by EPA, as well as any requirements set forth by the NRC for the radioactive component of the mixed.

In today's rulemaking, the Agency is promulgating treatment standards for radioactive wastes mixed with metal characteristic waste. The Agency believes that requiring facilities to re-treat radioactive mixed wastes could pose significant threates to human health and the environment (worker exposure, environmental releases), so that further treatment would increase, not minimize, potential threats. Therefore, the Agency will allow characteristic metal mixed wastes that have undergone stabilization prior to the effective date of Phase IV final rule, to comply with the LDR metal standards that were in effect at the time the waste was stabilized. Mixed radioactive/characteristic metal wastes that are stabilized after the effective date of the Phase IV final rule will be subject to the metal treatment standards promulgated in today's rulemaking.

In addition, the Agency recognizes the lack of available treatment capacity for previously untreated wastes. Therefore, the Agency is granting a two-year national capacity variance for mineral processing wastes mixed with radioactive wastes. While EPA appreciates the commenter's further concerns, this rule does not address the general rules for disposal of radioactive wastes. EPA believes that the hazardous waste portion of the material has been adequately treated to allow disposal of hazardous waste, however

DCN PH4P013
COMMENTER New York DEC
RESPONDER AC
SUBJECT RADI
SUBJNUM 013

COMMENT

> DEC agrees with the proposed handling of previously treated mixed wastes, contaminated with characteristic metals. Mixed wastes that have met the applicable standard at the time they were treated should be considered in compliance even if the standards were to change before actual disposal takes place. Disposal capacity inadequacy for mixed wastes has been and continues to be a major problem for LDR compliance. The retreatment of previously stabilized mixed wastes to address new standards for CMW will benefit no one while increasing the dangers of handling these wastes.

RESPONSE

> The Agency thanks the commenter for their support.

DCN PH4P031
COMMENTER Department of Energy
RESPONDER AC
SUBJECT RADI
SUBJNUM 031

COMMENT

On August 22, 1995, the Environmental Protection Agency (EPA) published a Notice of Proposed Rulemaking (NPRM) to amend the regulations for implementing the Land Disposal Restrictions (LDR) program (known as the LDR Phase IV proposed rule). As part of this NPRM, EPA presents and requests comment on options for regulating potential releases of

hazardous constituents from surface impoundments treating wastes that were hazardous when generated, but have been diluted to render them nonhazardous (i.e., decharacterized wastes). In addition, the NPRM includes proposed treatment standards for toxicity characteristic (TC) metal wastes. Furthermore, the NPRM suggests a number of regulatory modifications intended to clarify and "clean up" existing LDR requirements, and proposes procedures for streamlining state authorization to implement certain LDR regulations.

The Department of Energy (DOE) appreciates the opportunity to raise concerns and provide input in response to the LDR Phase IV proposed rule. The enclosed comments refer to potential regulatory approaches and topics covered by the NPRM, and are presented for your consideration in finalizing changes to the LDR requirements. These comments combine the viewpoints and concerns identified by DOE Field Organizations and Program Offices.

Many of DOE's comments on the LDR Phase IV proposed rule relate to the options being considered to control releases of hazardous constituents from surface impoundments that manage decharacterized wastes.

Regarding the proposed LDR treatment standards for TC metal wastes (D004 - D011), DOE fully supports EPA's proposal not to require re-treatment prior to final land disposal of mixed radioactive and characteristic metal wastes that are treated to meet existing LDR standards before the LDR Phase IV rule becomes effective, but that are not disposed until after the effective date.

The enclosed comments have been divided into two sections: general and specific. The general comments address broad concerns. The specific comments relate directly to potential regulatory approaches and issues raised in particular sections of the NPRM. For clarity, each specific comment is preceded by a reference to the section of the NPRM to which it applies and a brief description in bold-face type of the issue within that section to which DOE's comment is directed.

RESPONSE

The Agency thanks the commenter for providing comments. The Agency notes that the commenter’s specific comments are addressed separately in this document. (See the following responses).

DCN PH4P031
COMMENTER Department of Energy
RESPONDER AC
SUBJECT RADI
SUBJNUM 031

COMMENT

DOE's primary comments in this regard relate to concerns that dual regulation may be proliferated, concerns that implementation of the second option that EPA is considering would be overly complex, and concerns about possible delays in operating the high-level radioactive waste vitrification system at the Savannah River Site if the LDR Phase III and Phase IV rules are applied to some of the component facilities.

The SRS has designed and constructed an elaborate inter-connected treatment system for its mixed high-level wastes. The system has several integral facilities which perform various separation and treatment processes, some with an element of land disposal. The majority of this integrated system is operated under Industrial Wastewater Treatment Facility Permits issued by the South Carolina Department of Health and Environmental Control (SCDHEC). One of the system's treatment facilities, the Effluent Treatment Facility (ETF), has a National Pollutant Discharge Elimination System (NPDES) Permit, while another treatment facility, the Saltstone Processing Facility, is permitted under the CWA. The Saltstone Disposal Facility is permitted as an Industrial Waste Disposal Facility (Subtitle D). A third very important part of the treatment system, the Defense Waste Processing Facility (DWPF), will vitrify high-level waste under a CWA permit. Attachment A describes in detail the relationships of and permits held by the various integral facilities of the SRS mixed high-level waste treatment system.

DOE believes that, as proposed, the LDR Phase III and Phase IV rules could have a detrimental impact on the ability of some of the integral facilities of the SRS mixed high-level waste treatment system to support operation of the system as currently planned. This comment centers primarily on the Saltstone Processing and Disposal Facilities, although the DWPF is also of concern. This discussion does not address the DWPF at length because it is felt that EPA does not intend the LDR Phase III and Phase IV rules to impose treatment restrictions on high-level waste beyond the existing requirement to apply the specified technology of vitrification.

DOE Recommendations

DOE's primary concern in the LDR Phase III and Phase IV rulemakings with regard to the SRS is the status of the Saltstone Processing and Disposal Facilities which are currently permitted, respectively, under the CWA and as a Subtitle D

Industrial Waste Disposal Facility. The Saltstone Processing Facility treats a mostly inorganic, characteristically hazardous, radioactive wastewater (i.e., mixed waste) to form a non-hazardous, pumpable, low-level radioactive waste known as saltstone. The saltstone is pumped from the Processing Facility into the Disposal Facility, where it is placed into covered, above-ground concrete vaults. The pozzolanic saltstone solidifies within these vaults into a monolithic, non-hazardous waste. However, there is a potential for this stabilized waste to contain total concentrations of at least two organics at levels slightly above the UTS. Neither the Saltstone Processing Facility nor the Saltstone Disposal Facility contains surface impoundments. According to the proposed LDR Phase III rule, end-of-pipe equivalency requires that discharges from CWA and CWA-equivalent wastewater treatment facilities (including zero dischargers) meet the limitations and standards imposed on UHCs by an applicable CWA permit or authorization. If no such limitations or standards have been set, the UTS apply. Therefore, if the SRS Saltstone Processing Facility were to be governed by the LDR Phase III Rule (because this facility was construed to be an affected zero-discharge wastewater treatment facility administering CWA-equivalent treatment), then DOE believes the pumpable saltstone and/or the solidified saltstone could be required to meet the UTS since placement in the SRS Saltstone Disposal Facility represents ultimate land disposal. However, application of these new requirements to The Saltstone Processing and Disposal Facilities seems to go beyond the type of waste treatment systems EPA intended to cover (i.e., wastewater treatment facilities with surface impoundments).

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The proposed regulatory language [60 FR 11742] that appears to encompass the Saltstone Processing and Disposal Facilities within the scope of the LDR Phase III rule, and subsequently within the scope of the LDR Phase IV rule, even though neither facility contains surface impoundments, reads as follows:

§268.39 Waste specific prohibitions -- spent aluminum potliners, carbamates and organobromine wastes.

* * *

(b) On [Insert date two years from date of publication of the final rule],characteristic wastes that are managed in systems whose discharge is regulated under the Clean Water Act (CWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal.

. . .
* * *

DOE is of the opinion that such language could require the SRS (under the LDR Phase III rule) to demonstrate that all underlying constituents in the pumpable saltstone and/or solidified saltstone meet the UTS through some treatment mechanism other than dilution, prior to disposal in the permitted Subtitle D Saltstone Disposal Facility. Further, DOE believes that such language could also require the SRS, under the LDR Phase IV rule, to comply with additional controls on air emissions, sludges and leaks from the SRS Saltstone Processing and Disposal Facilities.− Response? The wastes managed in the SRS Saltstone Facilities are byproducts of pretreating high-level radioactive waste before vitrification, which is the LDR-specified treatment technology for high-level waste. If process changes were required in the SRS Saltstone Facilities to comply with the LDR Phase III and Phase IV proposed rules, delays in the high-level waste treatment program would undoubtedly result. Hence, DOE requests that EPA consider clarifying the proposed regulatory language quoted above in order to make clear that it did not intend to include facilities such as the SRS Saltstone Processing and Disposal Facilities within the scope of the LDR Phase III and Phase IV final rules.

b. As the discussion above indicates, DOE is extremely concerned that the LDR treatment requirements established under the LDR Phase III and Phase IV rules might be applied to outputs from certain integral facilities of the SRS treatment system for mixed high-level wastes (particularly, the Saltstone Processing and Disposal Facilities). Certain of the proposed requirements have the potential to detrimentally impact the ability of these facilities to support operation of the mixed high-level waste treatment system as currently planned. As also indicated in the preceding discussion, the Department believes that EPA does not intend the LDR Phase III and Phase IV rules regarding equivalency to apply to Clean Water Act permitted facilities that have no surface impoundments (such as the SRS Saltstone Processing Facility). This aside, DOE remains somewhat unclear as to the exact applicability of the LDR program to characteristically hazardous wastes being managed by the SRS Saltstone Processing and Disposal Facility. Therefore, the Department requests that EPA provide clarification and describe its regulatory interpretation of the specific applicability of the LDR requirements to such facilities (i.e.,non-surface impoundment

wastewater treatment facilities operating under State-issued CWA and Industrial Waste Disposal Facility (Subtitle D) permits). Specifically, the SRS Saltstone Processing Facility conducts CWA-equivalent treatment of characteristically hazardous, radioactive wastewaters (i.e., the waste stream contains corrosive, EP and TC metals, and TC organic wastes) in a RCRA-exempt CWA-permitted tank-based centralized wastewater treatment system. This treatment system forms a non-hazardous pumpable low-level radioactive waste stream which is pumped into the Saltstone Disposal Facility where it is placed into covered, above-ground concrete vaults. The waste solidifies within these vaults into a monolithic, non-hazardous waste. In other words, the CWA-equivalent treatment administered by this treatment system produces no liquid effluents. This particular component of the high-level waste treatment system, the Department requests that EPA clarify how the LDR program will apply to the treated wastes produced by these facilities (i.e., pumpable and/or solidified saltstone) after the LDR Phase III and Phase IV rules are finalized?

As previously stated, if process changes were required in the SRS Saltstone Facilities to comply with certain requirements of the LDR Phase III and Phase IV proposed rules, delays in the high-level waste treatment program would undoubtedly result. When the SRS vitrification system for managing high-level radioactive wastes was designed, those portions of the system for managing the low-level waste fraction (i.e., the Saltstone Processing and Disposal Facilities) were planned and permitted in accordance with existing standards. Now, as years of design and construction are nearly complete, it appears that new LDR treatment standards could be imposed on the low-level waste component of the high-level waste vitrification system, jeopardizing the schedule and viability of the entire project. Furthermore, in light of the design of the Saltstone Disposal Facility (i.e., above-ground concrete vaults with ground water monitoring), compliance with the LDR treatment requirements applicable to UHCs is unlikely to significantly reduce risks to human health and the environment associated with the solidified saltstone.

DOE urges EPA to consider implementing the following regulatory approach to ensure that the SRS high-level waste treatment system is not unintentionally or unduly impacted by these new LDR rules. The suggested approach would be to extend the LDR treatment standard for high-level mixed wastes to recognize the inter-dependence of the specified technology for

treating high-level waste (i.e., vitrification) and the technology for managing the low-level waste fraction of such high-level waste (i.e., immobilization/stabilization). In other words, DOE suggests that EPA adopt a specified technology treatment standard of immobilization/stabilization for the low-level waste fraction of high-level mixed wastes being treated by vitrification at SRS. DOE also requests that EPA clarify that treatment of UHCs is not required for either treated high-level mixed wastes, or the treated low-level waste fraction, from the SRS vitrification system. To explain the Department's concerns related to this issue in further detail and to support the proposed approach discussed above, DOE would welcome the opportunity to provide additional technical information about the SRS vitrification system, and to meet with EPA staff regarding such information (at the Agency's request and convenience).

RESPONSE

The Agency is not imposing additional treatment requirements on wastes for which BDAT is established as a specified method of treatment (*i.e.*, HLVIT). That is, these wastes do not have to be further treated for UHCs.

The commenter also raised a question regarding a residual from the treatment of a characteristically hazardous wastewater (hazardous due to high pH, metals and benzene). The residual is then stabilized and does not exhibit a characteristic. The stabilized waste is considered to be a new point of generation. Assuming the residual does not exhibit a characteristic, it is not considered a hazardous waste, and any UHCs present would not be required to be treated.

DCN PH4P031
COMMENTER Department of Energy
RESPONDER AC
SUBJECT RADI
SUBJNUM 031

COMMENT

V.D.3. Treatment Standard for Previously Stabilized Mixed Radioactive and Characteristic Metal Wastes
1. p. 43683, col. 3 -- EPA proposes to allow characteristic metal mixed wastes (i.e.,radioactive wastes which exhibit the toxicity characteristic for metals) that have undergone stabilization prior to the effective date of the Phase IV final

rule, to comply with the LDR treatment standards for metals that were in effect at the time the waste was stabilized. Mixed radioactive/characteristic metal wastes that are stabilized after the effective date of the LDR Phase IV final rule would be subject to the metal treatment standards in the Phase IV rule.

a. DOE fully supports EPA's proposal not to require re-treatment of mixed radioactive and characteristic metal wastes that have been treated (i.e., undergone stabilization) to meet currently applicable treatment standards, but that may not be land disposed until after the new treatment requirements of the LDR Phase IV rule become effective. Requiring re-treatment of previously stabilized wastes that have been in storage simply because of a change in standards that occurs before disposal can be accomplished makes no sense unless the benefits associated with re-treatment outweigh the risks to workers and the costs. DOE agrees with EPA's conclusion that in the case of previously stabilized mixed radioactive and characteristic metal wastes, the opposite may be true because the hazards from added worker radiation exposure associated with re-treatment would probably offset any gain in protection of human health and the environment resulting from compliance with the new metal treatment standards in the Phase IV rule.

b. As recognized in the preamble [60 FR 43683, col. 3], DOE has provided information to the Agency concerning treatment and storage of the low-level waste fraction of high-level reprocessing wastes at the West Valley Demonstration Project (WVDP). The Department brought this specific mixed waste example to the Agency's attention because it involves mixed radioactive and characteristic metal wastes that have been treated and stored to await the development of disposal capacity. DOE was concerned that if, as is proposed, the LDR Phase IV rule were to adopt more stringent treatment standards for Characteristic Metal wastes than the standards applicable when the WVDP wastes were treated, re-treatment might be necessary. This could occur unless disposal were accomplished before the LDR Phase IV rule became effective. DOE's concerns stemmed from the hazards (from added worker radiation exposure) and expense associated with re-treatment of these already treated wastes. With these concerns in mind, DOE requested that language be incorporated into the LDR Phase IV rule that would prevent any mixed radioactive and characteristic metal wastes that have been treated to previously applicable treatment standards, and that are being stored until disposal capacity is available, from having to be re-treated.

DOE believes EPA's proposed approach will address the Department's

concern regarding the WVDP situation. As such, DOE supports the proposed approach, as indicated in the preceding comment. The Department also believes, however, that the scope of this regulatory proposal is too limiting. Therefore, the Department recommends that the proposed provision be broadened to cover mixed radioactive and characteristic metal wastes that have been treated by treatment methods other than stabilization (e.g.,macroencapsulation of non-debris wastes). Stabilization is only one of many types of treatment that may be performed on characteristic metal wastes to comply with LDR treatment standards.

c. Because DOE supports EPA's proposal in this section of the preamble, the Department is concerned that EPA has not proposed any corresponding regulatory language to implement the section. DOE suggests that EPA add appropriate regulatory language to the proposed rule as follows:

(1) A section should be added to proposed 40 CFR 268.30 which would read:

§268.30 Waste specific prohibitions -- wood preserving wastes, and characteristic wastes that fail the toxicity characteristic.

* * * * *

(d) The requirements of paragraphs (a), and (b) of this section do not apply if:

* * * * *

(5) The wastes are radioactive wastes mixed with or containing D004-D011wastes, which have been treated to meet Subpart D treatment standards in effect prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive wasted mixed withD004-D011]. Such wastes must have been treated prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive wastes mixed with D004-D011] to be excluded from application of paragraph (b).

d. Given the lack of sufficient disposal capacity for mixed wastes, DOE urges EPA to consider including exceptions similar to the one proposed in the LDR Phase IV proposed rule (i.e., in section V.D.3 of the preamble) in future LDR treatment standard proposals. An important lesson DOE learned from the WVDP situation is that more treated DOE mixed wastes (both characteristic and listed) could fall into similar situations if EPA continues to promulgate increasingly more stringent LDR treatment standards in the future without grandfathering treated wastes that are being stored while they await disposal capacity. DOE recently signed compliance orders that set up schedules to treat mixed wastes at

over twenty-five sites. As a result, DOE will soon be treating thousands of cubic meters of mixed waste to the existing LDR treatment standards and storing the treated wastes (potentially over the next several decades) until mixed waste disposal caACity becomes available. Therefore, if EPA changes applicable LDR treatment standards to more stringent levels while such treated wastes are in storage, then without an exception, DOE and the commercial sector (which also has insufficient disposal capacity), could potentially be required to re-treat the stored wastes. This re-treatment could not only be expensive, but also cause unnecessary worker radiation exposure.

RESPONSE

The Agency agrees with the commenter that requiring facilities to re-treat radioactive mixed wastes could pose significant threats to human health and the environment (worker exposure, environmental releases). Therefore, the Agency will allow characteristic metal mixed wastes that have undergone stabilization prior to the effective date of Phase IV final rule, to comply with the LDR metal standards that were in effect at the time the waste was stabilized. Mixed radioactive / characteristic metal wastes that are stabilized after the effective date of the Phase IV final rule will be subject to the metal treatment standards promulgated in today's rulemaking. The Agency thanks the commenter for their support on this issue.

As for those wastes that have been treated by treatment methods other than stabilization (e.g., macroencapsulation of non-debris waste); Because the exposure concerns of re-treating the previously stabilized waste primarily center around the idea of first grinding up the stabilized material to retreat it and the potential added radiological exposures, the broadening of this exemption without more specific information is not warranted at this point. Of course, if any wastes already meet the applicable treatment standards, for example, macroencapsulation, then there is no need to initiate further treatment.

DCN PH4P031
COMMENTER Department of Energy
RESPONDER AC
SUBJECT RADI
SUBJNUM 031

COMMENT

COMMENTS ON PROPOSED REGULATORY LANGUAGE NOT DISCUSSED IN PREAMBLE

1. p. 43694, col.3, 40 CFR 268.40(e) -- EPA proposes the following language for 40CFR 268.40(e):

(e) For characteristic wastes subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," all underlying hazardous constituents (as defined in§268.2(I)) must meet Universal Treatment Standards, found in§268.48, Table UTS, prior to land disposal.

The regulatory language in existing §268.42(d) states that "where treatment standards are specified for radioactive mixed wastes in the Table of Treatment Standards, those treatment standards will govern." In the existing table "Treatment Standards for Hazardous Wastes" [40 CFR 268.40], specified technologies are identified that apply to certain radioactive mixed wastes containing D004-D011 (e.g., radioactive high level wastes generated during the reprocessing of fuel rods). Under the LDR Phase IV proposed rule (i.e., the changes proposed to §268.40),however, the specified technologies for mixed radioactive wastes containing D004-D011 are not listed.

The wording in proposed §268.40(e) states (as noted above) that "for characteristic wastes subject to treatment standards in the following table "Treatment Standards for Hazardous Waste,"all underlying hazardous constituents (as defined in §268.2(I)) must meet Universal Treatment standards, found in §268.48, Table UTS, prior to land disposal." This specific language does not exclude characteristic mixed radioactive waste for which EPA has established a technology-based standard. As such, radioactive mixed wastes containing characteristic metal wastes [e.g., high-level radioactive wastes generated during the reprocessing of fuel rods and carrying waste codes D002 or D004 through D011, for which the "treatment standard" is vitrification (HLVIT)] would also be required to meet UTS for underlying hazardous constituents. DOE does not believe EPA intended such a requirement. With respect to high level mixed wastes, for instance, EPA stated in the Third Third final rule preamble that the potential hazards associated with exposure to radioactivity during the analysis of high-level waste precluded the establishment of concentration-based treatment standards to be applied to the final treated glass form resulting from vitrification [55 FR 22520, 22627 (06/01/90)].

Therefore, to avoid confusion, DOE suggests that the wording of 40 CFR 268.40(e) in the final LDR Phase IV rule be modified to read as follows:

For characteristic wastes subject to treatment standards in

the following table "Treatment Standards for Hazardous Wastes," all underlying hazardous constituents (as defined in §268.2(I)) (except for those waste codes for which the treatment standard is a specified technology) must meet Universal Treatment Standards, found in §268.48, Table UTS, prior to land disposal.

RESPONSE

The Agency notes that today's rulemaking revises the treatment standards for metal characteristic wastes, including revision of certain metal numeric treatment standards and application of UTS levels to UHCs in the characteristic waste. (For additional information on applying UTS levels to UHCs in the characteristic waste, see the background material on UHCs in the RCRA docket for today's rulemaking.) Therefore, the treatment standards for radioactive wastes mixed with metal characteristic waste that were not specifically subcategorized in the Third Third rule are also affected. In other words, unless specifically noted in Sections 268.41, 268.42, or 268.43, the standards promulgated today apply to all mixed wastes. The underlying hazardous constituents requirements only applies to a specified method when in 40 CFR 268.40 the requirements includes "and must meet 268.48 standards."

Thus, the commenter is correct that if the treatment standard is a specified method of treatment, this is the only treatment requirement applicable to the wastes.

DCN PH4P031
COMMENTER Department of Energy
RESPONDER AC
SUBJECT RADI
SUBJNUM 031

COMMENT

2. p. 43695, 40 CFR 268.40, table of Treatment Standards for Hazardous Wastes --EPA proposes to modify the LDR treatment standard for waste code D003,Explosives Subcategory based on §261.23(a)(6), (7) and (8).
EPA has proposed that the columns of the Treatment Standards table labeled "Wastewaters" and"Nonwastewaters" be modified for waste code D003, Explosives Subcategory to read: "DEACT and meet §268.48 standards." DOE requests clarification as to why the D003, Reactive Sulfides Subcategory and the D003, Other Reactive Subcategory were not also modified to require meeting §268.48 standards. Will "DEACT" be the only required LDR treatment for such wastes?

RESPONSE

The Agency notes that, as stated in 40 CFR 268.40 (e) Applicability of Treatment Standards, characteristics wastes (D001 -D043) that are subject to treatment standards in the table “Treatment Standards for Hazardous Wastes,” all underlying hazardous constituents (as defined in 268.2(i)) must meet Universal Treatment Standards found in 268.48, “Table UTS,’ prior to land disposal as defined in 268.2(c). Thus, all reactive wastes must meet this requirement. For additional information on applying UTS levels to UHCs in the characteristic waste, see the background material on UHCs in the RCRA docket for today’s rulemaking.

DCN PH4P049
COMMENTER Molten Metal Technology
RESPONDER AC
SUBJECT RADI
SUBJNUM 049

COMMENT

Molten Metal Technology, Inc. (MMT), a company that provides an innovative source reduction and recycling technology known as Catalytic Extraction Processing (CEP), is pleased to submit an original and two copies of these comments on EPA's Proposed Rule on Land Disposal Restrictions - Phase IV. See 60 Fed. Reg. 43654 (Aug. 22, 1995). These comments address two issues: First, EPA's approach to cross-media transfer of hazardous constituents from surface impoundments, and second, EPA's proposal to grant a capacity variance for certain mixed wastes subject to the Phase IV Rule.

Mixed waste, like most hazardous waste, is subject to the LDR regulations. The LDR regulations require that hazardous waste be treated to specified standards prior to land disposal. If there is insufficient treatment capacity to treat a particular waste, EPA may grant a "capacity variance"for up to three years. With few exceptions, EPA has not established specific treatment standards for mixed wastes, but rather has specified that the LDR treatment standard for a given hazardous waste applies to the hazardous component of a mixed waste.
Over the years, EPA has regularly issued capacity variances for mixed wastes. In 1990, EPA granted a two-year national capacity variance for radioactive waste mixed with most hazardous waste. This variance was subsequently extended for one year but has now expired. Another capacity variance was granted in August 1994, as part of the LDR "Phase II" rulemaking. At that time, EPA noted that "DOE is in the process of increasing its capacity to manage mixed RCRA / radioactive wastes" but that a "significant capacity shortfall currently exists." Continuing the pattern, EPA proposed

another capacity variance in the Phase III rulemaking (see 60 Fed.Reg. 11702, 11734 (March 2, 1995)), and is now proposing to grant a two-year national capacity variance to radioactive waste mixed with hazardous wastes affected by the Phase IV rulemaking. See 60 Fed. Reg. at 43686.

The traditional technologies that can comply with the LDR standards (e.g., incineration and combustion) are considered to be mature, demonstrated technologies that have been "available"for treatment of hazardous wastes for many years. Nevertheless, as a practical matter, these treatment technologies have not been successfully applied on a large scale to mixed waste. As a result of the lack of suitable treatment capacity, most mixed waste is currently in storage facilities awaiting treatment, which is not permissible under RCRA. This mixed waste storage dilemma was one of the significant drivers leading to enactment of the Federal Facility Compliance Act, which obligates the Department of Energy to develop mixed waste treatment plans and develop mixed waste treatment capacity.

MMT does not understand why EPA apparently continues to believe that traditional treatment technologies such as incineration and combustion are appropriate or realistically will ever be available for mixed waste. There are significant technical, political, and regulatory difficulties associated with these technologies. From a technical standpoint, they do not address or minimize radiological hazards. In fact, they typically disperse radioactive constituents into the air, and create a radioactive ash that requires further treatment prior to disposal as a mixed waste. Also, combustion technologies are meeting with increasing public opposition and EPA, state and local regulatory agencies are implementing programs and policies designed to encourage the use of alternatives to combustion for treatment of hazardous waste (see, e.g., EPA's "Hazardous Waste Combustion Strategy"). When attempts are made to apply combustion technologies to mixed waste, these political and regulatory difficulties are likely to intensify, and MMT does not believe that these technologies can be relied upon to provide any significant treatment capacity for mixed waste.

There is no reasonable basis for assuming that traditional combustion technologies will in the foreseeable future provide adequate or appropriate treatment capacity for mixed waste. Thus, the continuing practice of granting capacity variances amounts to little more than a holding action which will not allow time for mixed waste combustion capacity to develop, but rather just

delays the time when it will become obvious that these wastes must be treated using new, innovative technologies that specifically address and minimize all the hazards presented by mixed waste, including radioactive hazards. MMT therefore urges EPA to reconsider its practice of assuming that LDR requirements for mixed waste can be achieved by using traditional hazardous waste treatment technologies to treat the hazardous portion of mixed waste, and instead identify and designate as BDAT those technologies which address and effectively minimize all the hazards presented by mixed waste, including radioactive hazards. MMT recognizes that the needs of DOE and others who currently store mixed waste because of the current shortage of available capacity must be responsibly addressed in accordance with current laws and regulations. Thus, at this time MMT does not question the need for, or oppose the granting of, mixed waste capacity variances. However, MMT strongly urges EPA to condition such variances upon a commitment to deploy and use technology which can address both the RCRA and radiologic hazards posed by mixed waste and realistically can be sited and permitted.
In this regard, M4 Environmental L.P., a partnership of MMT and Lockheed Martin Corporation, has presented information and data to the Department of Energy (DOE) which demonstrate that CEP is available and can provide a unique innovative solution to many of the most difficult mixed waste management issues that the DOE faces. M4 is currently constructing a CEP facility in Oak Ridge, Tennessee that will have the capability to process significant quantities of mixed wastes for which there is currently no available treatment capacity, while meeting and surpassing any applicable LDR standards. This facility will become operational within the next six months. Thus MMT believes that substantial effective mixed waste treatment capacity will in fact became available in the very near future, obviating the need for future mixed waste capacity variances or extensions.

RESPONSE

There presently is no available treatment capacity for most radioactive mixed waste, and EPA is consequently extending the enforcement policy on storage of these wastes six (6) more months. This policy indicates that if treatment capacity becomes available it must be used immediately. Thus, if the commenter's system comes on line and can treat effectively, it would have to be utilized.

DCN PH4P056
COMMENTER Westinghouse

RESPONDER AC
SUBJECT RADI
SUBJNUM 056

COMMENT

6. Westinghouse also recommends EPA clarify the requirements for obtaining treatability variances for stored mixed wastes. Our primary concern is that treatability variance applicants should not be required to resample and analyze the waste only because the treatment standard has been revised. Requesting additional, unnecessary or marginally useful information could result in workers being unnecessarily exposed to radiation.

RESPONSE

Treatability variances as stated in 40 CFR 268.44 are not specific to radioactive mixed wastes. The treatability variance may be granted for wastes that have LDR standards that are expressed as concentrations of hazardous constituents in the waste or waste extract (i.e., a numerical standard). Under the language of the treatabilility variance, petitions must demonstrate that the waste of concern cannot be treated to the specified levels because its physical or chemical properties differ significantly from the waste used to establish the LDR treatment standard. Given the hazards of handling mixed waste, however, it may be that no further sampling and analysis might be needed. (Hazardous waste destined for land disposal but stored prior to meeting existing treatment requirements are still subject to meeting LDRs' UTS requirements before disposal of these wastes can occur.) In addition the Agency will allow characteristically radioactive mixed metal waste that have been stabilized prior to the effective date of Phase IV final rule, to comply with the LDR standards that were in effect at the time the waste was treated.

DCN PH4P056
COMMENTER Westinghouse
RESPONDER AC
SUBJECT RADI
SUBJNUM 056

COMMENT

Issue 4: Treatment Standard for Previously Stabilized Mixed Radioactive and Characteristic Metal Wastes Reference: Preamble at Section V.D.3., page 43683
Westinghouse supports the EPA proposal to exempt characteristic metal mixed waste from the Phase IV LDR treatment standards if the

mixed waste was stabilized prior to the effective date of the Phase IV LDR final rulemaking and if the stabilized waste complies with the LDR TREATMENT standards that were effect when the waste was stabilized. However, this proposal should be expanded to include all previously stabilized characteristic and listed mixed wastes that met the standards in effect at the time of treatment but, due to regulatory changes, may no longer meet the standards. The same rationale used to justify the West Valley example provided in the preamble would apply to other characteristic and listed mixed wastes that have been previously stabilized; opening drums, grinding already treated masses of mixed waste to treat them again. could expose workers to unnecessary and unacceptable levels of dust containing metals, organics and radioactivity without a commensurate environmental benefit.

An example would be ash that has been stabilized from an incinerator that burns listed/characteristic mixed waste. At the Savannah River Site (SRS), which is managed by Westinghouse on behalf of the Department of Energy (DOE), the Consolidated Incineration Facility (CIF) generates ash and blowdown residues. The stabilization unit (called the ashcrete unit) treats the ash and blowdown to meet the LDR treatment standards, producing an average of about 100 drums of stabilized waste monthly. This mixed waste is being stored in RCRA storage facilities until RCRA Subtitle C disposal vaults can be built. It is possible that waste generated prior to Phase IV promulgation may not meet the Phase IV requirements; (or future unknown requirements) thus possibly prohibiting disposal of the stabilized waste without further treatment.

Additionally, with the evolution of the land disposal restrictions program, it is possible to have standards change numerous times prior to final disposal. Treatment and disposal capacity for mixed waste is already lacking, and constantly changing standards will only makes matters worse. We support expansion of the concept that wastes treated to meet current standards will not have to be further treated if standards change prior to disposal.

RESPONSE

The Agency agrees with the commenter that requiring facilities to re-treat radioactive mixed wastes could pose significant threats to human health and the environment (worker exposure, environmental releases). Therefore, the Agency will allow characteristic and listed radioactive mixed metal mixed wastes that have undergone stabilization prior to the effective date

of Phase IV final rule, to comply with the LDR metal standards that were in effect at the time the waste was stabilized. Mixed radioactive/characteristic and listed metal wastes that are stabilized after the effective date of the Phase IV final rule will be subject to the metal treatment standards promulgated in today's rulemaking.

DCN PH4P056
COMMENTER Westinghouse
RESPONDER AC
SUBJECT RADI
SUBJNUM 056

COMMENT

Issue 9: Regulatory Language Found in Section 268.40(e) Reference: Regulatory text at page 43694
In the Phase II and Phase III rules, high level radioactive wastes generated during the reprocessing of fuel rods and having the waste codes D002, D004-D011, have specified technologies listed in §268.40. As stated in §268.42(d), where the treatment standards are specified for mixed radioactive wastes in the Table of Treatment Standards, those treatment standards will govern. In Phase IV, the specified technologies for mixed radioactive wastes containing D004-D011 are no longer listed. The wording in §268.40(e) states that "for characteristic wastes subject to treatment standards in the following table, 'Treatment Standards for Hazardous Wastes,' all UHC (as defined in §268.2(I)) must meet Universal Treatment standards found in §268.48, Table UTS, prior to land disposal." This specific language does not exclude characteristic mixed radioactive waste for which EPA has assigned a technology-based standard, such as the vitrification of high level fuel rod reprocessing waste. In the Third Third rule preamble, EPA stated that the potential hazards associated with exposure to radioactivity during the analysis of high level waste precluded the establishment of a concentration-based treatment standard for the final treated glass form (55 FR 22627). It appears that this 1990decision supports the conclusion that EPA does not intend to require the management of UHC in such high-level waste since compliance with associated concentration-based standards would require the analysis of the high-level glass form. To clarify the final rule, it is suggested that the wording to §268.40(e) be modified to read: For characteristic wastes subject to treatment standards in the following table "Treatment Standards

for Hazardous Wastes," all UHC (as defined in §268.2(I), except for those waste codes that have a specified technology) must meet Universal Treatment Standards (UTS) found in §268.48, Table UTS, prior to land disposal.

SPECIFIC COMMENTS ON THE IMPACT OF THE PROPOSED LDR - PHASE IV RULEMAKING ON THE SAVANNAH RIVER SITE HIGH LEVEL WASTE SYSTEMS

As mentioned in our first general comment, because of the inconsistencies between the preamble language and the regulatory language, it is unclear whether the Phase III and IV LDR proposals apply only to CWA and CWA-equivalent systems that include surface impoundments or to all types of CWA and CWA equivalent systems. This was a concern that was expressed in our comments on the Phase III proposal and it remains with the Phase IV.

The SRS has designed and constructed an inter-connected treatment system for mixed high-level wastes. The system has several integral facilities which perform various separation and treatment processes, some with an element of land disposal. The majority of this integrated system is operated under Industrial Wastewater Treatment Facility Permits issued by the South Carolina Department of Health and Environmental Control (SCDHEC). One of the system's treatment facilities, the Effluent Treatment Facility (ETF), has a National Pollutant Discharge Elimination System (NPDES) Permit. Another treatment facility, the Saltstone Processing Facility, is also permitted under the CWA. The Saltstone Disposal Facility is permitted as an Industrial Waste Disposal Facility (Subtitle D). A third, very important part of the treatment system, the Defense Waste Processing Facility (DWPF), will vitrify the high level waste under a CWA permit, (see the attached Addendum for a detailed description of these facilities). These new regulations could potentially impact the ability of these facilities to continue to operate indirect support of the SRS's high level waste system as currently planned. The discussions in this comment package center primarily on impacts to the Saltstone Processing and Disposal facilities under the proposed regulation. Although the DWPF is also of concern, it is felt that EPA does not intend to impose additional treatment restrictions on high level waste other than the requirement to meet the specified technology of vitrification. However, due to certain ambiguities in the proposed rule, additional clarification is needed on this point.

The primary concern at the SRS with these two rulemakings is the status of the Saltstone Disposal Facility currently permitted as a

Subtitle D Industrial Waste Disposal Facility. This facility treats an inorganic mixed wastewater, which is characteristically hazardous. After pozzolonic stabilization, the waste is rendered non-hazardous and is disposed in above-ground concrete vaults. There is a potential for this stabilized waste to contain at least two organics slightly above the UTS. Regulatory language in Phase III and the likelihood of carry-over to the Phase IV rule at §268.39 (b) are of principal concern. It states:
On [Insert date two years from date of publication of the final rule],characteristic wastes that are managed in systems whose discharge is regulated under the Clean Water Act (CWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal.
Westinghouse is of the opinion that such language could require the site to demonstrate that all underlying constituents of this waste stream meet the UTS through some treatment mechanism other than dilution, prior to disposal in the permitted Subtitle D disposal facility. We request clarification of the applicability of these two proposals to this particular treatment system. If EPA truly intends these regulations to include treatment in CWA systems that involve an element of land disposal other than a surface impoundment, then EPA must carefully consider the impacts the proposed rulemakings on the SRS's high level mixed waste treatment system and facilities, taking into account the unique characteristics and risks associated with liquid mixed wastes

Recommendation D: Extend the Specified Treatment Technology for High level Wastes to Stabilization of Low-Level Wastes Derived From High level Wastes
When vitrification was named the specified technology for high level wastes, the portion of the SRS system for treating the low-level fraction of high level waste was not an issue.
This portion of the system was in compliance with all regulations that were applicable at that time. Now, as years of design and construction are nearly complete, a new requirement is suddenly potentially applicable to this portion of the high-level waste treatment system. One option for relief would be to extend the applicability of the specified technology for treating high level waste to the low-level fraction of that waste stream, and determine that an immobilization/stabilization technology is a specified technology for that low-level fraction. The waste treated in The Saltstone facilities are produced during the

pretreatment step to treat high level waste by vitrification which is the specified technology. If process changes were required to comply with this proposed rule, delays in the high level waste treatment program would undoubtedly result. Additionally, the EPA should clarify that high level and low level mixed wastes with a specified method of treatment do not need to be treated for underlying constituents.

TECHNICAL JUSTIFICATION

At the SRS, additional removal or treatment of underlying hazardous constituents in the high level radioactive waste facilities in operation, as well as those about to startup, beyond that currently being performed would provide little or no value since the intent of the proposed regulations will be satisfied by the current operational plans for these facilities. Line breaks associated with new equipment tie-ins to existing radioactive components caused during construction, and emissions of both radioactive and hazardous pollutants into the atmosphere from monitoring requirements contained in the proposed regulations could actually cause an increase in releases of radioactive and hazardous constituents.
The Saltstone Processing and Disposal Facilities, which mixes low-level mixed waste with fly ash, slag, and cement to produce a concrete-like grout, accomplishes the intent of the proposed regulations by immobilizing the underlying hazardous constituents (UHC). As discussed in more detail in the Addendum, the organics in the wastewater treated at the Saltstone Processing Facility are immobilized with the saltstone such that they meet the concentration based standards of the UTS when subjected to a TCLP. These facilities already have as their principal design tenet, the protection of the public and the environment by preventing contamination to the groundwater. This protection is the essence of the Phase III and Phase IV proposed regulations.

ADDENDUM

Detailed Analysis of the Impact of the Proposed Phase III and IV Land Disposal Restrictions to the Savannah River Site High Level Waste System Facilities
Introduction The Environmental Protection Agency has proposed new Resource Conservation and Recovery Act (RCRA) regulations known as LDR Phase III [60 FR 11702 (March 02, 1995)],and LDR Phase IV [60

FR 43654 (August 22, 1995)] which would require hazardous or mixed wastes that are treated and de-characterized by an approved treatment method be further treated if there are any "underlying" hazardous constituents in the untreated waste stream in concentrations greater that the Universal Treatment Standard (UTS) limits. Although the Phase III rules were intended to be applicable to discharges managed under the Clean Water Act or Clean Water Act-equivalent systems, the clear language of the proposed regulations make the restrictions applicable to zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal. The Defense Waste Processing Facility (DWPF) and Saltstone Disposal Facility (SDF) at the Department of Energy's Savannah River Site (SRS) discussed in this report could be construed as being zero discharger facilities engaged in CWA-equivalent treatment. These new regulations could potentially impact the ability of these two facilities to continue to operate in direct support of the SRS's High Level Waste treatment system as currently planned. The discussions in this report center primarily on the Saltstone Processing and Disposal Facility impacts under the proposed regulations.

I. Overview of Potential Impacts

Currently, approximately 34 million gallons of high level mixed (radioactive and hazardous) wastes are contained in 50 large, but aging, underground storage tanks. Some storage tanks were installed in the 1950s. This high level waste will be treated by the LDR specified technology of vitrification by way of complex, integrated treatment facilities at the Savannah River Site. Vitrification has been determined to be the safest, long-term method for management of such mixed waste. The proposed LDR Phase III and IV regulations could require that certain de-characterized hazardous wastes be further treated to remove underlying hazardous constituents. Such regulations do not provide any additional benefit to the safe operation of the SRS facilities, or to human health or the environment. Modifications to existing facilities involved in radioactive operations to accommodate additional treatment of constituents before they are to be immobilized would be very costly and cannot be justified from a technical standpoint. Such action could delay for many years the removal of liquid high level mixed wastes stored in tanks that have been in operation for more than forty years. More importantly, such attempts could introduce a very real danger from potential personnel exposure and emissions to the environment. In preparation for startup, the DWPF Vitrification Facility, Saltstone Processing

Facility, and The Saltstone Disposal Facility have undergone numerous independent and in-house rigorous examinations to demonstrate their ability to safely treat, store, and dispose of mixed wastes under their current configurations.

II. High Level Waste System Description Overview

A. Major Facilities. As a result of several decades of nuclear materials production, approximately 34 million gallons (129 million liters) of high level radioactive waste have been accumulated at the SRS. The high Level Waste (HLW) System seeks to maintain safe storage until such time as the waste shave been treated and properly disposed. This system includes operations which receive various waste streams, places them into large underground storage tanks, transfers the waste to pretreatment facilities, and which treats the waste at the Defense Waste Processing Facility (DWPF). The DWPF is a one of a kind vitrification system. The entire system includes the following key processing facilities:
Waste Storage: Underground Storage Tanks (fifty-one tanks, one out of service)

Volume Reduction: Evaporator Systems
Pre-Treatment: In-Tank Precipitation Facility Extended Sludge Processing Facility
Waste Treatment: Defense Waste Processing Facility Saltstone Processing Facility F-Area and H-Area Effluent Treatment Facility
Waste Disposal: Saltstone Disposal Facility NPDES Permitted Outfall Federal Repository
A schematic diagram has been included with this report as Figure 1 to depict the relationships between the various facilities.
B. Underground Storage Tanks Fifty large underground storage tanks located in two tank farms store approximately 34million gallons of high level mixed waste produced from a number of sources as a result of the separation of useful products from spent aluminum-clad nuclear fuels and targets. Each tank has a capacity of approximately one million gallons. Some of these tanks have been in service since1954. The newest tank was placed into service in 1986. [Ref. 2]. The primary objective of the high Level Waste System is shifting from waste storage to removal of mixed waste from the older tanks to prepare the waste for feed to the Defense Waste Processing Facility (DWPF). The wastes in these tanks are in the form of saltcake (approximately 14.1 million

gallons), sludge including soluble salts and aluminum (approximately 4 million gallons), and salt supernate (approximately 15.9 million gallons) which contains the highest radioactive constituency.

C. Evaporator Systems The High Level Waste System utilizes two evaporators to reduce the inventory of wastes in the tanks for the near term. Their operation is crucial to the success of the mission to remove wastes from the older tanks. To reduce the cost of storage and improve safety, liquid supernate in the tanks is evaporated to reduce its volume and mobility. The overheads are condensed and monitored to ensure that excessive amounts of radionuclides are not being entrained. [Ref. 3 at23]. When necessary, the overheads are passed through an ion exchange column to remove radioactive cesium. Following the condensing and monitoring, the overheads are transferred to the Effluent Treatment Facility for further decontamination and eventual release to the environment. The concentrated supernate is transferred to the In-Tank Precipitation Facility (ITP) where it is treated to remove the majority of the radionuclides so that the salt solution can be treated in the Saltstone Processing Facility. This ability to reduce the waste volumes is a key planning assumption for the High Level Waste System due to the need for tank space capacity at the time of the Defense Waste Processing Facility startup.

D. In-Tank Precipitation Facility The In-Tank Precipitation Facility (ITP) treats the salt solution from the evaporators to remove the soluble radioactive metal ions such as cesium, strontium, uranium, and plutonium. This removal is accomplished through the precipitation of the salt solution with sodium tetraphenylborate or adsorbed on monosodium titanate to form insoluble solids. The resulting precipitate, which is filtered to concentrate the solids, contains most of the radionuclides. It is then sent on to the Defense Waste Processing Facility for vitrification in glass. The decontaminated salt solution or filtrate is passed through a stripper column to remove the benzene generated from the decomposition of the tetraphenylborate. The filtrate containing primarily sodium salts of hydroxide, nitrate, and nitrite is then transferred to the Saltstone facility for stabilization and disposal.

E. Extended Sludge Processing Facility The insoluble sludge stored in the aging underground tanks is transferred to the Extended Sludge Processing Facility where it is washed to remove the aluminum and soluble salts resulting from the addition of

sodium hydroxide to the fresh waste being sent to the tanks. If the aluminum and soluble salts were not removed, then the Defense Waste Processing Facility would have to increase the ratio of frit to waste which would increase the number of glass canisters produced. The washed sludge will be transferred to the Defense Waste Processing Facility for vitrification. The wash water will be returned to an evaporator system or reused to dissolve saltcake depending on the salt concentration.

F. Defense Waste Processing Facility The one-of-a-kind Defense Waste Processing Facility was designed in the late 1970s with construction started in 1984 and completed in 1989. This facility has gone through numerous mechanical check-outs, modifications to existing systems and cold chemical runs to prepare for the start radioactive operations in December of 1995. High level mixed waste streams (the precipitate from the In-Tank Precipitation Facility and the washed sludge from the Extended Sludge Processing Facility) are immobilized by melting the waste with borosilicate glass frit and pouring the radioactive mixture into stainless steel canisters. This process, known as vitrification, is the prescribed treatment standard for high level mixed waste. The canisters will then be placed temporarily into a temperature controlled glass waste storage building adjacent to the vitrification facility where they will remain until transported for disposal to a permanent federal geological repository.

Within the Defense Waste Processing Facility, the removal of organics from the cesium-containing aqueous stream produces benzene in the salt process cell. The precipitate slurry feed would undergo acid hydrolysis to separate the low radioactive organic portion from the high radioactive water based portion. The low radioactive organic portion containing principally benzene would be sent to the Organic Waste Storage Tank outside of the vitrification facility where it will later be destroyed by incineration at the Consolidated Incineration Facility. [Ref. 4]. The high radioactive portion will go into the melter to be vitrified.

The chemical process cell (also known as melter feed preparation) within the Defense Waste Processing Facility will receive the washed sludge from the Extended Sludge Processing Facility. In this cell, a condenser is used to remove moisture and mercury from the waste stream. This mercury is acid washed, water washed, and vacuum distilled in preparation for eventual disposition. The Department of Energy has explored the sale of this product to off-site vendors and is reviewing other options including

amalgamation.

G. Saltstone Processing and Disposal Facilities The Saltstone Processing and Disposal Facilities, a major part of this integrated radioactive waste management system, were permitted for construction by the South Carolina Department of Health and Environmental Control (SCDHEC) in October of 1986 and construction was completed in 1988. The Saltstone facilities began processing mixed waste on June 14, 1990. The land upon which these facilities were constructed was chosen because of the water table depth, distance to surface water and the public, and its proximity to the waste generation site.

Pursuant to the policies and guidelines of the Department of Energy and other regulatory agencies, a radiological performance assessment (RPA) was prepared for the Saltstone facilities to provide reasonable assurance that the design and disposal methods would comply with the performance objectives of the Department of Energy in a manner that would protect human health and safety, the environment, and the ground water resources.

Low level mixed liquid (process aqueous salt solution) wastes from the ITP facility and the ETF are solidified in a safe and efficient pozzolanic process at the Saltstone Processing Facility. These wastes are combined with a blend of cement, flyash, and slag to generate anon-hazardous, pumpable, low level waste known as saltstone.

The saltstone grout is then pumped to the Saltstone Disposal Facility consisting of covered, above-ground concrete vaults where the grout solidifies into a monolithic, non-hazardous solid waste.

H. Effluent Treatment Facility Wastewater consisting of evaporator overheads and other low level waste streams are sent to the Effluent Treatment Facility. At this facility, the wastewaters undergo decontamination through a series of pH adjustments, solids filtration, heavy metal and organic adsorption, reverse osmosis, and ion exchange. After these steps have been completed, the treated effluent is analyzed and discharged to the environment through a National Pollutant Discharge Elimination System permitted outfall. Each of the treatment processes has varying attributes.

The spent resin used in the removal of heavy metals, such as mercury and lead, is not a hazardous waste since it does not fail the Toxicity Characteristic Leaching Procedure. The activated carbon is used for organics removal and could potentially become a mixed waste if the concentrations of benzene in the influent wastewaters are high. In the Effluent Treatment Facility evaporator, most of the contaminants go to the concentrate bottoms,

but some species such as metallic mercury and ammonia are volatile if the pH is not low enough. The ETF evaporator bottoms are eventually transferred to the Saltstone facility for disposal in the grout.

III. Existing Treatment of Hazardous Constituents

The quantities of the metals and organics in the waste streams fed to the Saltstone Facility are quite small. The treatment to produce saltstone at the Saltstone Processing Facility converts characteristically hazardous wastewater (hazardous due to high pH, metals and benzene) into a non-hazardous solid waste that does not fail the TCLP. After the stabilization process is complete, the saltstone may possibly exceed the UTS limits for only two organics, n-butyl alcohol and phenol. Both of these organics result from a slow breakdown of chemicals used to treat HLW in the ITP facility to enable separation into high-level and low-level fractions. The n-butyl alcohol is a product of the hydrolysis of tributylphosphate, which is added to prevent foaming during processing and filtration to concentrate HLW solids in the ITP process. The phenol is generated as a by-product of radiolysis of tetraphenylborate, which is used as the precipitating agent to convert radioactive cesium into an insoluble compound that is removed by filtration. Inthe strong caustic environment of the salt solution (ph > 13), both phenol and n-butyl alcohol are actually present as soluble sodium salts of the parent organic compound, and are thus not amenable to removal using demonstrated techniques such as distillation or adsorption on carbon beds that are normally used on wastewater containing only trace levels of contaminants. The phenol is a by-product of radiolysis of sodium tetraphenylborate. In other words, the action of the radionuclides in the solution actually breaks down the sodium tetraphenylborate to produce phenol as a by-product. These chemical reactions occur continuously such that even if/when these two organics are removed, they would "grow" back into the solution. It is conceivable that even if a very costly (in terms of both time and money) addition was made to the facility to remove these two organics, they could not be removed to the levels required by the UTS because of the continuous "growing in". Furthermore, these two organic constituents are chemically bound into the saltstone as they are converted to salts during the stabilization process.
They will not leach out at levels above the UTS limits when

subject to the TCLP, however, they will probably appear (converted back to solution) when subject to a Totals analysis as required by section 268.48. If the EPA intends that the Phase III and Phase IV regulations apply to this type of facility, it is possible that the situation just described could be an inconsistency between the Atomic Energy Act and RCRA.

SRS removes these organics to the greatest extent possible based upon current proven technologies. During the design phase, limits were placed on the concentrations of these constituents acceptable by the Saltstone facility to meet regulatory requirements defined by the EPA and adopted by the SCD HEC at the time of construction. Nitrate was selected for modeling studies due to its high concentration in the waste and its solubility in water. The saltstone was tested for toxicity over a range of metal concentrations to establish limits in the feed that would be blended with flyash, cement, and slag. As a result of these limits, the saltstone produced was shown to be a non-hazardous waste as defined by regulatory tests which allowed the facility to be permitted as an industrial solid waste disposal landfill site. These permits require periodic reports to the state describing the wastewater composition, both chemical and radioactive, test results on the saltstone produced, and the results of groundwater monitoring. To date, the Saltstone production has complied fully with all of the terms and conditions contained in the permits.

The performance objectives of the Saltstone facilities for protection of the groundwater resources require that concentrations of chemicals and radioactive contaminants at any point of compliance not exceed the standards for public drinking water supplies as established by the EPA. Since the Saltstone facilities safely commenced low level radioactive waste operations in 1990, groundwater monitoring at the points of compliance (located at the boundary of the disposal vault facility) have met or exceeded the safe drinking water standards. A detailed radiological performance assessment on the SDF vaults clearly demonstrates that 1) organics are not released through leaching (TCLP results show leaching well below UTS for organics even though "total"organics in the waste form are above UTS levels), 2) the concrete vault provides an effective engineered barrier against migration of releases, 3) hydrogeological computer modeling has estimated the time required for nitrates to reach maximum groundwater contamination concentration levels is 7,100 years, 4) at no time will the groundwater contamination exceed State groundwater standards, and 5) the risk for the existing

disposal system is less than 1E-06. Groundwater monitoring is installed to verify compliance with groundwater standards and provide detection of any releases that may occur.
Benzene and other organics are generated as by-products from operations such as the radiolysis of sodium tetraphenylborate. Portions of these organics are released into the atmosphere. For example, the benzene generated at the In-Tank Precipitation Facility (ITP) is released through a tall stack at the Benzene Stripper Building and through the purge exhaust vents of the tanks associated with the ITP system. These emissions are regulated under permits issued by the South Carolina Bureau of Air Quality Control.
Wastewaters consisting of evaporator overheads and other low level waste streams are sent to the Effluent Treatment Facility. At this facility, the wastewaters undergo decontamination through a series of pH adjustments, solids filtration, heavy metal and organic adsorption, reverse osmosis, and ion exchange. After these treatment steps have been completed, the treated effluent is analyzed and discharged to the environment through an NPDES permitted outfall. These treatment steps concentrate the contaminants into smaller volumes of waste which are further concentrated by evaporation. The ETF evaporator bottoms are eventually transferred to the Saltstone facility for disposal in the grout.
EPA has indicated that situations which are expected to pose little risk should be excluded from regulatory controls, and that regulations should provide flexibility in dealing with site-specific factors and cost-effective control alternatives. Treating and disposing of the LLW fraction with the current Saltstone treatment process results in no significant risks or impacts to human health and the environment. Installing additional treatment for removing organics to UTS levels would actually result in increased risk due to 1) releases and exposure resulting from the organic treatment process and from the treatment and disposal of the subsequent mixed wastes that would be generated from this process, 2) increased risks associated with the extended time the high level radioactive waste would have to remain in the aging million gallon storage tanks,and 3) environmental impacts associated with construction of additional process facilities.

RESPONSE

The Agency is not imposing additional treatment requirements on wastes for which BDAT

is established as a specified method of treatment (*i.e.*, HLVIT). That is, these wastes do not have to be further treated for UHCs.

The commenter also raised a question regarding a residual from the treatment of a characteristically hazardous wastewater (hazardous due to high pH, metals and benzene). The residual is then stabilized and does not exhibit a characteristic. The stabilized waste is considered to be a new point of generation. Assuming the residual does not exhibit a characteristic, it is not considered a hazardous waste, and any UHCs present would not be required to be treated.

DCN PH4P089
COMMENTER ASTSWMO
RESPONDER AC
SUBJECT RADI
SUBJNUM 089

COMMENT

11. The proposed handling of previously treated mixed wastes contaminated with characteristic metal is suitable. Mixed wastes that have met the applicable standard at the time they were treated should be considered in compliance even if the standards were to change before actual disposal takes place. This is consistent with the Storage Prohibition [40 CFR 268.50(e)], where wastes that have met the applicable treatment standards are excluded from the storage prohibition. Disposal capacity inadequacy for mixed wastes continues to be a major problem for LDR compliance. The retreatment of previously stabilized mixed wastes to address new standards for characteristic metal waste will benefit no one while increasing the dangers of handling these wastes.

RESPONSE

The Agency thanks the commenter for their support.

DCN PH4P113
COMMENTER Chemical Manufacturers Association
RESPONDER AC
SUBJECT RADI
SUBJNUM 113

COMMENT

C. The treatment standards for previously stabilized mixed radioactive and characteristic metal wastes should not be changed. As the Agency points out, to require more stringent treatment standards for radioactive wastes that have been previously stabilized could increase threat to human health and the environment. Knowing this and taking into consideration that the only reason these wastes have not already been land disposed is that capacity has not been available makes it quite reasonable and, in fact necessary, for the Agency to accept those LDR standards which existed at the time of stabilization for these mixed wastes that have been stabilized at "pre Phase IV" standards.

RESPONSE

The Agency thanks the commenter for their support.

Phase IV Second Supplemental Proposed Rule:
Comments and Responses on TC Metals Mixed with Radioactive Wastes

1. 2P4P-00014 Westinghouse Electric Corporation

Section III.D.6., Proposed Revision for UTS for Silver, page 26046

EPA requested comment- on quantities of silver non-waste waters that would be land disposed. The September 1996 Mixed Waste Inventory Report for the Savannah River Site, a Department of Energy (DOE) facility managed by Westinghouse, shows 7,240 m^3 of mixed low level wastes that include D011. There is also 126,325 m^3 of high level wastes that include D011. Since these wastes are radioactive, it is unlikely that any silver would be reclaimed or recycled. Some of these waste streams will be macro encapsulated for land disposal. Others will be incinerated or vitrified into glass.

Response

The Agency thanks the commenter for providing the data on quantities of radioactive mixed wastes. The Agency recognizes the lack of available treatment capacity for characteristic and listed mixed radioactive metal bearing wastes and believes that any new commercial capacity that is available for mixed radioactive wastes must be used for mixed wastes that were regulated in previous LDR rulemakings and whose variances have already expired. Therefore, the Agency is granting a two-year national capacity variance for mineral processing wastes mixed with radioactive wastes.

Stabilization of characteristic and listed mixed radioactive metal bearing wastes that have previously achieved the statutory treatment standard requirements do not have to be retreated. Likewise, for those characteristic and listed mixed radioactive metal bearing wastes that will not be treated until after the promulgation of Phase IV, will be required to meet the revised treatment standards, including being promulgated in today's Phase IV rulemaking. For those radioactive mixed metal bearing wastes that can not meet these revised UTS if any should petition the Agency for a treatability variance under 40 CFR 268.44.

2. 2P4P-00023 U.S. Department of Energy (DOE)

On May 12, 1997, the Environmental Protection Agency (EPA) published a Supplemental Proposed Rule regarding revision of the universal treatment standards (UTS) for twelve metal constituents and corresponding revisions to the waste-specific land disposal restrictions (LDR) treatment standards for nonwastewater forms of characteristic metal wastes, mineral processing wastes, and other metal-bearing wastes. The Supplemental Proposed Rule also: (1) requested comment on several specific options concerning the regulation of secondary materials from

mineral processing and the regulation of materials being co-processed in Bevill-exempt mining units; (2) presented new information on threats to human health and the environment from Bevill mining and mineral processing wastes and requested comment on whether such wastes, which are currently excluded from federal hazardous waste regulations, warrant regulatory controls; (3) proposed an exclusion from the definition of solid waste for certain materials reused by wood preserving operations; (4) proposed regulations clarifying the standards used by EPA for deciding whether to grant variances from LDR treatment standards; and (5) proposed regulations to implement a prohibition on the use of most hazardous wastes as fill material.

The Department of Energy (DOE) appreciates the opportunity to provide comments on the May 12, 1997 Supplemental Proposed Rule (hereinafter referred to as the Phase IV second supplemental proposal). The enclosed comments combine the viewpoints and concerns identified by DOE field organizations and program offices. This consolidated DOE response to the Phase IV second supplemental proposal focuses on several issues raised in the LDR Phase IV rulemaking series [consisting of the initial LDR Phase IV proposed rule (60 FR 43654, August 22, 1995), the Phase IV first supplemental proposal (61 FR 2338, January 25, 1996), a notice of data availability on Phase IV issues (61 FR 21418, May 10, 1996), and the Phase IV second supplemental proposal] that are of particular concern to the Department.

DOE reiterates its support for EPA's proposal in the initial Phase IV proposed rule to allow characteristic metal mixed wastes that have undergone stabilization prior to the effective date of the Phase IV final rule, to comply at disposal with the LDR metal treatment standards that were in effect at the time the wastes were stabilized (notwithstanding that actual disposal may occur after the effective date of the Phase IV final rule). The enclosed comments also respond to information provided in the second supplemental proposal (62 FR 26063) concerning the protective capability of vitrification technology. Furthermore, DOE comments support a number of EPA's contemplated regulatory amendments regarding revised treatment standards for characteristic metal wastes, clarification of treatment variance rules, and banning use of prohibited hazardous waste as fill material. Finally, a number of comments and suggestions are provided relative to the proposed regulatory language presented in the second supplemental proposal.

The enclosed comments have been divided into two sections: general and specific. The general comment addresses a broad concern. The specific comments relate directly to potential regulatory approaches and issues raised in particular sections of the Phase IV second supplemental proposal. For clarity, each specific comment is preceded by a reference to the section of the second supplemental proposal to which it applies and a brief description in bold-face type of the issue within that section to which DOE's comment is directed.

1. DOE reiterates its support for EPA's proposal in the initial Phase IV proposed rule to allow characteristic metal mixed wastes, that have undergone stabilization prior to the effective date of the Phase IV final rule, to comply at disposal with the land disposal restriction (LDR) metal standards that were in effect at the time the wastes were stabilized, notwithstanding that actual disposal may occur after the effective date of the Phase IV final rule.

In the preamble to the initial LDR Phase IV proposed rule, the U.S. Environmental Protection Agency (EPA) discussed its intention to allow characteristic metal mixed wastes (i.e., radioactive wastes that exhibit the characteristic of toxicity for one or more metals) that have undergone stabilization prior to the effective date of the Phase IV final rule, to comply at disposal with the LDR metal standards that were in effect at the time the waste was stabilized [60 FR 43654, 43683; Aug. 22, 1995]. EPA acknowledged that there is a good possibility that when these previously treated characteristic metal mixed wastes are disposed, the Phase IV final rule will be in effect and the metal portion of such wastes will be subject to revised, potentially more stringent, treatment standard levels. Even so, EPA stated its belief that the prior stabilization of such wastes achieves the statutory minimized threat standard, and to require re-treatment would not minimize threat, but could increase it. DOE recognizes that EPA has not revisited this aspect of the Phase IV proposed rule in the Phase IV second supplemental notice because no new information has become available prompting the Agency to modify or augment its earlier proposal. Nevertheless, DOE considers this issue to be very important and wants to take this opportunity to again support EPA's August 1995 proposal and to restate some of the Department's concerns.

a. As was stated in DOE's comments in response to the initial Phase IV proposed rule, [FN1: DOE Comments, Land Disposal Restrictions -- Phase IV: Issues Associated with Clean Water Act Treatment Equivalency, and Treatment Standards for Wood Preserving Wastes and Toxicity Characteristic Metal Wastes, Specific Comment V.D.3, Item 1, p. 33-35 (Nov. 20, 1995).] requiring re-treatment of previously stabilized wastes that are in storage awaiting development of disposal capacity, simply because a revision to the LDR treatment standards becomes effective before the stored wastes can be disposed, makes sense only if the benefits associated with re-treatment outweigh both the risks to workers and the costs. DOE agrees with EPA's conclusion in the case of previously stabilized characteristic metal mixed wastes, that the hazards from added worker radiation exposure associated with re-treatment would probably offset any gain in protection of human health and the environment that could result from compliance with the Phase IV final metal treatment standards.

b. Because stabilization is only one possible type of treatment that could be performed on characteristic metal mixed wastes to achieve compliance with LDR treatment standards, DOE recommends that EPA broaden the final Phase IV compliance exception to cover previously treated, stored, characteristic metal mixed wastes that comply with the LDR treatment standards applicable at the time of treatment, regardless of the treatment method used to achieve compliance (e.g., stabilization, macro encapsulation of non-debris wastes).

c. DOE is particularly concerned that the final Phase IV compliance exception for previously treated characteristic metal mixed wastes be appropriately codified. Therefore, DOE suggested the following possible regulatory language in its comments in response to the Phase IV proposed rule,[FN2: DOE Comments, Land Disposal Restrictions --Phase IV: Issues Associated with Clean Water Act Treatment Equivalency, and Treatment Standards for Wood Preserving Wastes and Toxicity Characteristic Metal Wastes, Specific Comment V.D.3, Item 1, p. 34 (Nov. 20, 1995).]

and continues to advocate that this or similar language be added to 40 CFR 268.30(d) [as proposed at 60 FR 43654, 43694; Aug. 22, 1995].

> §268.30 Waste specific prohibitions -- wood preserving wastes, and characteristic wastes that fail the toxicity characteristic.
>
> (d)The requirements of paragraphs (a) and (b) of this section do not apply if:

5) The wastes are radioactive wastes mixed with or containing D004 -D011 wastes, which have been treated to meet Subpart D treatment standards in effect prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive wastes mixed with D004 - D011]. Such wastes must have been treated prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive wastes mixed with D004 - D011] to be excluded from application of paragraph (b).

d. Finally, in future proposals of LDR treatment standards (whether such proposals address listed or characteristic wastes), DOE urges EPA to consider including, if appropriate, compliance exceptions for affected mixed wastes similar to the one put forth in the initial Phase IV proposed rule. Such compliance exceptions would preclude re-treatment to meet revised LDR treatment standards of affected mixed wastes that have been treated before the effective date of a revised standard to meet the applicable standards at the time of treatment, and are in storage awaiting development of disposal capacity. In 1995 and early 1996, DOE signed 31 compliance orders (pursuant to the Federal Facility Compliance Act) with EPA or States that require compliance with approved Site Treatment Plans (STPs). The approved STPs provide overall schedules for achieving compliance with LDR storage and treatment requirements for mixed waste at each site. As a result, DOE is moving forward with actions (e.g., appropriate NEPA reviews and RCRA permitting activities) to support treatment of thousands of cubic meters of mixed waste to meet the LDR treatment standards applicable at the time of treatment. Once treated, the wastes will be stored (potentially for an extended period) until suitable mixed waste disposal capacity becomes available. If EPA revises otherwise applicable LDR treatment standards during the period that such wastes are in storage, DOE could be required to re-treat the stored wastes before disposal, unless EPA also adopts an exception. For the same reasons that justify granting an exception from revised LDR treatment standards for previously treated characteristic metal mixed wastes (see item a., above), EPA should consider incorporating similar exceptions into future rulemakings (where appropriate and where revised standards are more stringent). Such exceptions would allow previously treated mixed waste affected by a revised LDR treatment standard to comply with the standard that was in effect at the time the waste was treated rather than the revised standard because the hazards from added worker radiation exposure associated with re-treatment would probably offset any gain in protection of human health and the environment that could result from compliance with the revised standard.

1. p. 26046, col. 3 -- EPA states its belief that silver wastes are generally recycled due to their economic value. As a result, the Agency speculates that there may be little or no land

disposal of silver wastes, hence little or no impact from applying a new treatment standard. EPA is seeking information on quantities of silver nonwastewaters that would be affected by LDR treatment standards.

Many DOE sites generate, or have stored inventories of mixed wastes assigned the D011 waste code, among other codes. Data reported in the 1995 DOE Mixed Waste Inventory Report, as revised by updated information submitted to the states during 1996, indicate that approximately 41,350 cubic meters of nonwastewater D011 mixed wastes (in the form of mixed low level wastes and mixed transuranic wastes) were stored at 25 DOE sites as of December 1996. Additional nonwastewater D011 mixed wastes are projected to be generated at 20 of these sites during the coming 5 years. If practicable, DOE may use metal removal/recovery technologies to manage some nonwastewater D011 mixed waste streams. However, due to the radioactive nature of nonwastewater D011 mixed waste streams, DOE is treating or plans to treat most such streams using macro encapsulation, stabilization, vitrification, or incineration technologies. Treatment residues from these technologies that meet LDR treatment standards will be land disposed as appropriate when capacity becomes available.

page 6, section b.

In General Comment 1 (p. 1), DOE discusses its support for EPA's proposal in the initial Phase IV proposed rule to allow characteristic metal mixed wastes, that have undergone stabilization prior to the effective date of the Phase IV final rule, to comply at disposal with the LDR metal standards that were in effect at the time the wastes were stabilized. However, if EPA decides for some reason not to grant such an exception, DOE believes a treatment variance based on the "inappropriate" test might be fitting for situations such as the previously stabilized mixed wastes located at the Department's West Valley Demonstration Project (WVDP). [FN3: As discussed in the preamble to the initial LDR Phase IV proposed rule [60 FR 43654, 43683, col. 3], and in DOE's comments submitted in response [Specific Comment V.D.3, item 1.b, p. 33 (Nov. 20, 1995)], approximately 21,000 drums being stored at the WVDP contain formerly characteristic metal mixed wastes that have been stabilized to meet currently applicable LDR treatment standards. Continued storage of such drums in accordance with the WVDP Site Treatment Plan is expected until approved disposal capacity becomes available. However, at the present time it appears that disposal capacity is unlikely to be approved before the final LDR Phase IV rule becomes effective. Therefore, unless EPA adopts an exception or grants a variance, the final LDR Phase IV rule, if promulgated as proposed, would mandate re-treatment of the previously stabilized wastes at WVDP because it would impose revised treatment standards for characteristic metal wastes that would be more stringent than existing standards. DOE is concerned that re-treatment of the previously stabilized wastes would create hazards to workers from added radiation exposure, and would be expensive compared with any gain in protection of human health and the environment resulting from compliance with the revised LDR treatment standards.] Therefore, should EPA decide against the exception, DOE requests that the Agency consider mentioning the WVDP situation in the preamble to the final revised 40 CFR 268.44 as an example of circumstances that should qualify for an LDR treatment variance based on the

"inappropriate" test.

Response

The Agency agrees with the commenter that prior stabilization of such wastes achieves the statutory minimize threat standard, and to require re-treatment could increase risk significantly. Therefore, no further treatment is required for mixed waste where already stabiilized to meet an existing treatment standard but have not yet been disposed. For those characteristic and listed mixed radioactive metal bearing wastes that will undergo treatment post promulgation of the Phase IV, they will be required to meet the standards being finalized in today's rule. In addition, the Agency recognizes the lack of available treatment capacity for previously untreated wastes and, therefore, is granting a two-year national capacity variance for mineral processing wastes mixed with radioactive wastes.

DCN PH4P067
COMMENTER Horsehead/Zinc Corp.
RESPONDER AC
SUBJECT SULF
SUBJNUM 067

COMMENT

EPA should increase the UTS level for sulfide to ensure that wastewater treatment systems can both meet the UTS for sulfide and effectively treat characteristic metal wastewaters.

RESPONSE

The Agency reviewed the basis for the sulfide standard in 40 CFR 268.48 and found it was only intended to apply to F039. Today, the Agency is clarifying and correcting 268.48 UTS table to limit sulfide to F039 and not to the mineral processing wastes identiifed by commenters. These mineral processing wastes will of course be subject to the “DEACT” standard for reactive sulfide waste streams, as set out in 268.40(a)(1) and (a)(5). The Agency will continue to determine if a separate UTS standard for sulfide from reactive wastes from the mineral processing and other sectors is needed and if so, will propose a standard in the near future.

DCN PH4P067
COMMENTER Horsehead/Zinc Corp.
RESPONDER AC
SUBJECT SULF
SUBJNUM 067

COMMENT

III. EPA SHOULD INCREASE THE SULFIDE UTS LIMIT FOR WASTEWATERS.

One of the current thrusts of the Clinton Administration is to introduce some common-sense flexibility in RCRA's LDR program (for example, earlier this year the President proposed several"rifle shot" legislative reforms to RCRA). One example of the exercise of such flexibility already available in the current program, without any need for legislation, would be to retract the applicability of the UTS to Class I underground injection control ("UIC") wells. As ZCA pointed out in the comment it submitted on EPA's proposed Phase III LDR rule, the decision in Chemical Waste Management v. EPA, 976

F.2d 2 (D.C. Cir. 1992), does not compel the application of the UTS to Class I UIC wells. Neither the Chemical Waste Management decision nor RCRA section 3004(m) requires EPA to impose rigid treatment standards for decharacterized wastes managed in Class I wells. Section 3004(m) requires only that EPA establish land disposal treatment standards that "substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized." 42 U.S.C. § 6924(m). Thus, the treatment of hazardous constituents in characteristic wastes is not mandated unless those constituents are present at levels that threaten human health or the environment. ZCA and HRD therefore support the Administration's efforts to exempt decharacterized wastes from LDR treatment requirements if they are managed in Clean Water Act or Clean Water Act-equivalent systems.

In a more specific context raised in the Phase IV Proposal, EPA should exercise its flexibility by increasing the UTS level for sulfide in wastewaters, which is currently 14 mg/l.

Non-reactive sulfides commonly are used to treat wastes by chemical precipitation, which frequently increases the sulfide level in the treated waste stream. EPA has even identified chemical precipitation wastewater treatment as BDAT for several metal-bearing hazardous wastes, including K048-K052. See 57 Fed. Reg. 958, 964 (January 9, 1992). Since the Phase IV rule represents the first widespread application of the UTS to characteristic metal wastes, it is likely that many characteristic metal wastes will be treated with sulfides in chemical precipitation. Retaining the current sulfide level of 14 mg/l for UTS wastewaters in the Phase IV Proposal may significantly and unnecessarily increase the treatment costs for metal wastewaters because of the possibility that current treatment systems, which are fully protective of human health and the environment, would not achieve the sulfide wastewater UTS limit, principally because the treatment itself may increase the sulfide level. As EPA recognizes, chemical precipitation using sulfide is a longstanding, effective, and environmentally protective method of waste treatment. 57 Fed. Reg. at 964. Therefore, EPA should increase the UTS wastewater sulfide limit to ensure that wastewater treatment systems are able to continue using an effective treatment agent and consistently comply with the UTS.

RESPONSE

was only intended to apply to F039. Today, the Agency is clarifying and correcting 268.48 UTS table to limit sulfide to F039. Therefore, the current UTS standard for sulfide is applicable only to

processing wastes will, of course, be subject to the "DEACT" standard for reactive sulfide waste streams as set out in 268.40 (a)(1) and (a)(5). The Agency will continue to determine if a

is needed, and if so will propose one in the future.

requirements when they are managed in Clean Water Act or Clean Water Act-equivalent systems, the Agency notes that this issues is not addressed in this rulemaking. EPA recognizes, chemical

waste treatment 57 FR 954. The Agency is currently conducting a 5-year study to assess the effects of decharacterized wastes placed in surface impoundments, and the issue of RCRA

study.

DCN PH4P115

RESPONDER AC
SUBJECT SULF

COMMENT

CFI also wishes to comment upon the designation of sulfide-bearing

designation of sulfide as a constituent that is not amenable to biological treatment is based on a list submitted by the Chemical

1993 Supplemental Information report on potential responses to Chemical Waste Management, Inc. v. EPA.5

its members, CFI's experience is that some sulfide-bearing waste streams are amenable to biological treatment and thus it is

nonamenable. CFI's wastewater treatment system has achieved consistently high treatability for sulfide-bearing waste streams.

sulfide-bearing wastestreams, it is likely that other manufacturing entities are achieving similar or better treatability efficiencies.

CFI would be pleased to provide whatever data it has available on this subject to EPA, if EPA would find these data useful.

RESPONSE

The Agency thanks the commenter for providing additional information on sulfide-bearing waste streams and, if appropriate, might consider this issue in a separate rulemaking.

Phase IV Second Supplemental Proposed Rule:
Comments and Responses on Issues Related to Sulfide

1. 2P4P-00046 Mineral Policy Center

The lack of regulations on the handling of acid generating materials at mines is a huge gap in RCRA. These acid generating sulfide materials (primarily pyrites) are abundant in many metal ores. When exposed to air and water, they generate acid, which is harmful to aquatic life. This acidity, in turn, enhances the toxicity of heavy metals, by dissolving them and making them more available for uptake by organisms. According to the Bureau of Mines, mining contamination, much of it from acid mine drainage, has polluted more than 12,000 miles of river and streams and 180,000 acres of lakes. [FN 1: Robert L.P. Kleinmann, *Acid Mine Drainage,* ENGINEERING AND MINING JOURNAL, July 1989, p. 161.] Another harmful characteristic of acid mine drainage is its insidiousness and longevity. Acid mine drainage can begin many years after a mine closes, but once triggered, can last for centuries and is very difficult to control. Several experts have reported that at present pollution rates, the abandoned Iron Mountain Superfund site in Northern California can be expected to leach acid for at least 3,000 years before the pollution source is exhausted. [FN 2: D. Kirk Nordstrom, et al.. *The Production and Seasonal Variability of Acid Mine Drainage From Iron Mountain, California: .A Superfund Site Undergoing Rehabilitation*, in ACID MINE DRAINAGE: DESIGNING FOR CLOSURE, p. 18 (21 June 199 1).] Thus acid mine drainage can plague the public with environmental and human health risks -- as well as cleanup costs -- in perpetuity.

RCRA's failure to deal with acid generating materials is especially serious because current federal and states regulation do not prescribe adequate requirements for monitoring wastes to test for their potential to generate acid. . Therefore, imposing such testing requirements and other controls on acid generating materials through a RCRA Subtitle C mining program would be a positive step in addressing the long-term environmental and health threats posed by mining wastes.

Response

The Agency notes that Section 3001(b)(3)(A)(ii) of RCRA excludes “solid wastes from the extraction, beneficiation, and processing of ores and minerals” from regulation as hazardous waste under Subtitle C of RCRA,.. absent special study by the Agency and a specific determination that regulation as a hazardous waste is warranted. Therefore, regulation of acid mine drainage and similar mining waste is not within the scope of today’s rulemaking.

7. 2P4P-00088 FMC Corporation

Clarifier Underflow Processing

Clarifier underflow, a non-wastewater, will be pumped to a surge tank and then to a series of lime-treatment (caustic hydrolysis) reactors for phosphorus removal and metals stabilization. The reactors may be followed by gas separation units designed to remove phosphine from the reactor slurry.

Specific reactor and degreaser conditions (residence time, temperature, and degree of agitation, rate, along with distribution design for nitrogen sparging, etc.) must be determined in laboratory tests. Because UTS for non-wastewaters have been lowered for several critical metals in the proposed Phase IV Land Disposal Restriction for Mineral Processing Wastes, required conditions will probably be significantly different than those defined in our previous lab and pilot tests. Additional reagents other than lime, such as sulfides or chlorides, may be required for treatment and are planned for evaluation in the laboratory tests. Residuals from these reagents may affect gas- and solids-handling processes, including sizing and materials of construction, downstream of the reactors. Nitrogen sparging requirements in the reactors and in possible downstream de-gassing units must be defined.

Deficient reactor design could result in a treated non-wastewater stream in which phosphorus removal is inadequate or that fails the new UTS standards. Inadequate gas removal may result in inordinate amounts of phosphine being discharged from reactor solids if no downstream solids handling system is installed (see Limed Solids Handling System discussion below), or could significantly increase the design challenge for the solids handling system. Again, laboratory testing is currently on hold pending "Treatability Study" notification of EPA, and the required 45-day waiting period following such notification.

Lime Treatment Process Phosphine Handling System

Gases from the Caustic Hydrolysis reactors, and from other Lime Treatment System process equipment, will be vented through ducts to a Phosphine Combustion/Scrubbing system. Conceptually, this system will consist of a phosphine burner followed by a combustion-gas scrubber. Specific engineering details that must be established include phosphine burner characteristics, capacity and materials of construction, and combustion gas scrubber type, characteristics, capacity, and materials of construction.

System design and capacity will depend not only on estimated gas generation rate and composition from the caustic hydrolysis reactors but on gases generated in other process systems, including the Limed Solids Handling System (see discussion below). The scrubber design will be particularly critical in terms of adequate removal of gas impurities before discharge. Design of both the burner and scrubber, including combustion conditions, scrubber removal efficiency, and materials of construction for both units, will also depend on specific reagents employed in the reactors and other process. Any use of sulfide or chloride reagents, for example, could have a major impact on materials selected for the gas handling system, and the required removal of any gases associated with these reagents could alter the planned gas handling process.

A technology development effort to define specific burner and scrubber conditions is underway, and includes outside engineering experts in the design of burner/scrubber systems as well as FMC engineering resources. A regulatory review of relevant design requirements, standards, and considerations is also underway with our environmental consultants and attorneys. These efforts will result in a system that is adequately designed to handle system gas flows properly and that meets required regulations for combustion systems of this type.

Response

The Agency thanks the commenter for providing supporting information for its request for a capacity variance. The Agency notes that, in response to the first supplemental proposal, reviewed the first three waste streams—Medusa scrubber blowdown, Anderson filter media (AFM) rinsate, and furnace building washdown—for which FMC requested a national capacity variance. EPA subsequently proposed to grant a two-year capacity variance for these waste streams. In response to the second supplemental proposal, FMC requested a national capacity variance for three additional waste streams—NOSAP slurry, precipitator slurry, and phossy water—and stated that it has eliminated the generation of the AFM rinsate waste stream. After careful review of FMC's petition, the Agency has determined that the five waste streams being generated at the Pocatello facility would require a national capacity variance and, therefore, is granting today a two-year national capacity variance for these wastes.

Two commenters raised issues related to the D003 subcategory reactive sulfide standard in 40 CFR 268.48 and its applicability to their processes including mineral processing wastes. We reviewed the basis for the sulfide standard and found that it was only intended to apply to F039 wastewaters.

Today, we are clarifying and correcting 268.48 UTS table to limit sulfides to F039. Therefore, the UTS standard for sulfide, today, will only apply to F039 and not to the mineral processing wastes indicated by commenters. These mineral processing wastes will, of course, be subject to the "DEACT"standard for reactive sulfide waste streams, as set out in 268.40 (a)(1) and (a)(5). The Agency will continue to determine if a separate UTS number for reactive sulfide from mineral processing and other sectors is needed and if so will propose a treatment standard in the future

8. 2P4P-00103 Mining Impact Coalition of Wisconsin Inc.

Since acid mine drainage and resulting Metals contamination of surface and groundwater often take years to (develop, how many current mining operations will ultimately become polluters due to today's inadequate regulatory program? We are extremely concerned with the ever-rising costs associated with almost intractable clean-ups such as the Sumnitville disaster. Due to the difficulty and costs associates with remediation of acid mine drainage should be the first goal. And just like wastes likely to produce acid, any other hazardous materials produced by

mining must be treated in accordance with federal hazardous waste rules. The mining industry loophole must be repealed to protect our surface lakes, streams, rivers and our air and drinking water.

In Wisconsin, a 55-million-ton, polymetallic massive sulfide deposit (zinc and copper) mine proposed by Exxon and Rio Algom's Crandon Mining Company is of major concern. This proposal includes an estimated 22 million tons of waste tailings to be impounded in a waste dump at the site, with an additional 22 million tons to be backfilled underground. These waste tailings are by definition, high sulfide and capable of producing large amounts of acid mine drainage for at a minimum, hundreds of years. The waste heavy metals known to consist in this company's proposal include: mercury, lead, copper, zinc, cadmium, selenium, and many more.

Response

The Agency notes that Section 3001(b)(3)(A)(ii) of RCRA excludes “solid wastes from the extraction, beneficiation, and processing of ores and minerals” from regulation as hazardous waste under Subtitle C of RCRA. Therefore, regulation of acid mine drainage and similar mining waste is not within the scope of today’s rulemaking.