ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60, 63, 260, 261, 264, 265, 266, 270, and 271

[FRL–5818–9]

Revised Technical Standards for Hazardous Waste Combustion Facilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of data availability and request for comments.

SUMMARY: This document is a notice of availability and invitation for comment on the following information pertaining to the proposed revised standards for hazardous waste combustors (61 FR 17358 (April 19, 1996)): Report on the status of setting national emission standards for hazardous air pollutants (NESHAPS) based on the revised emissions database; Report on the selection of pollutants and source categories, including area and major sources; report on the status of various implementation issues, including compliance dates, compliance requirements, performance testing, and notification and reporting requirements; and report on the status of permit requirements, including waste minimization incentives.

DATES: Written comments must be submitted by June 2, 1997.

ADDRESSES: Commenters must send an original and two copies of their comments referencing docket number F–97–CS4A–FFFFF to: RCRA Docket Information Center, Office of Solid Waste (5305G), U.S. Environmental Protection Agency Headquarters (EPA, HQ), 401 M Street, SW., Washington, DC 20460. Deliveries of comments should be made to the Arlington, Virginia address listed below. Comments may also be submitted electronically through the Internet to: rcra-docket@epamail.epa.gov. Comments in electronic format should also be identified by the docket number F–97–CS4A–FFFFF. All electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. For other information regarding submitting comments electronically or viewing the comments received or supporting information, please refer to the proposed rule (61 FR 17358 (April 19, 1996)).

Commenters should not submit electronically any confidential business information (CBI). An original and two copies of the CBI must be submitted under separate cover to: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, 401 M Street, SW., Washington, DC 20460.

Public comments and supporting materials are available for viewing in the RCRA Information Center (RIC), located at Crystal Gateway One, 1235 Jefferson Davis Highway, First Floor, Arlington, Virginia. The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, except for Federal holidays. To review docket materials, the public must make an appointment by calling 703–603–9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost $0.15 per page.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at 1–800–424–9346 or TDD 1–800–553–7672 (hearing impaired). In the Washington metropolitan area, call 703–412–9810 or TDD 703–412–3323. The RCRA Hotline is open Monday–Friday, 9 a.m. to 6 p.m., Eastern Standard Time. The RCRA Hotline can also provide directions on how to access electronically some of the documents and data referred to in this notice via EPA's Cleanup Information Bulletin Board System (CLU-IN). The CLU-IN modem access phone number is 301–589–8366, or Telnet to clu-in.epa.gov for Internet access. The files posted on CLU-IN are in Portable Document Format (PDF) and can be viewed and printed using Acrobat Reader.

For more detailed information on specific aspects of this notice, contact Larry Denyer, Office of Solid Waste (5302W), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, 703–308–8770, e-mail address: denyer.larry@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

The Agency specifically solicits comment on the following documents:

(1) Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database, April 1997.

(2) Draft Technical Support Document for HWC MACT Standards (NODA), Volume II: Evaluation of CO/HC and DRE Database, April 1997.

(3) Draft Technical Support Document for HWC MACT Standards (NODA), Volume III: Evaluation of Metals Emissions Database to Investigate Extrapolation and Interpolation Issues, April 1997.

In preparing this notice, the Agency considered comments on the proposed rule, including those listed below. EPA is soliciting responsive comments regarding certain data and information presented in these comments:

(1) Cement Kiln Recycling Coalition
(2) Chemical Manufacturers Association
(3) Coalition for Responsible Waste Incineration
(4) Don Clay Associates
(5) The Dow Chemical Company
(6) Environmental Technology Council
(7) Holnam Inc.
(8) Lafarge Corporation
(9) Molten Metal Technology, Inc.
(10) The Natural Resources Defense Council, Inc.
(11) Rollins Environmental Services, Inc.
(12) Safety-Kleen Corp.
(13) Texas Natural Resource Conservation Commission
(14) vonRoll/WTI

Readers should note that only comments about new information discussed in this notice will be considered by the Agency. Issues related solely to the April 19, 1996 proposed rule and other subsequent notices that are not directly affected by the documents or data referenced in today's Notice of Data Availability are not open for further comment.

Glossary of Acronyms

acfm—Actual Cubic Feet per Minute
ACI—Activated Carbon Injection
APCD—Air Pollution Control Device
BIF—Boiler and Industrial Furnace
BTF—Beyond-the-Floor
CAA—Clean Air Act
CEMS—Continuous Emissions Monitoring System
D/F—Dioxins/Furans
ESP—Electrostatic Precipitator
gr/dscf—Grains per Dry Standard Cubic Foot
HAP—Hazardous Air Pollutant
HC—Hydrocarbons
HWC/HWI—Hazardous Waste Combustor/Incinerator
IWS—Ionizing Wet Scrubber
LVM—Low-volatile Metals
LWAK—Lightweight Aggregate Kiln
MACT—Maximum Achievable Control Technology
MTEC—Maximum Theoretical Emission Concentration
NESHAPs—National Emission Standards for HAPs
NODA—Notice of Data Availability
NPRM—Notice of Proposed Rulemaking
NSPS—New Source Performance Standards
PM—Particulate Matter
RCRA—Resource Conservation and Recovery Act
SRE—System Removal Efficiency
SVM—Semi-volatile Metals
TEQ—Toxic Equivalent
µg/dscm—Micrograms per Dry Standard Cubic Meter

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Part One: Background and Overview of Today's Notice

I. Background

On April 19, 1996, EPA proposed revised standards for three source categories of hazardous waste combustors (i.e., hazardous waste incinerators and hazardous waste-burning cement kilns and lightweight aggregate kilns (LWAKs)), 61 FR 17358. After an extension, the comment period closed on August 19, 1996.

The Agency subsequently published two Notices of Data Availability (NODA). The first NODA, published on August 23, 1996 (61 FR 43501) invited comment on information pertaining to a peer review of three aspects of the proposed rule, additional analyses of fuel oils that would be used to establish a comparable fuels exclusion, and information on a synthesis gas process. The comment period on that NODA closed on September 23, 1996. The second NODA, published on January 7, 1997 (62 FR 960) provided notice and opportunity to comment on an updated hazardous waste combustor database containing the emissions and ancillary data that the Agency plans to use to develop the final rule. The comment period on that NODA closed on February 6, 1997.

EPA's proposal to revise standards for hazardous waste incinerators and hazardous waste-burning cement kilns and LWAKs is under joint authority of the Clean Air Act, as amended, (CAA) and the Resource Conservation and Recovery Act, as amended (RCRA). The proposed emission standards were developed under the CAA provisions concerning the maximum level of achievable control over hazardous air pollutants (HAPs), taking into consideration the cost of achieving the emission reduction, any non-air quality health and environmental impacts, and energy requirements. These Maximum Achievable Control Technology (MACT) standards, also re ferred to as National Emission Standards for Hazardous Air Pollutants (NESHAPs), were proposed for the following HAPs: dioxins/furans (D/F), mercury, two semi-volatile metals (lead and cadmium), four low volatility metals (antimony, arsenic, beryllium, and chromium), particulate matter, and hydrochloric acid/chlorine gas. Other toxic organic emissions were addressed by standards for carbon monoxide (CO) and hydrocarbons (HC).

Because of the joint authorities for this rule, the proposal also contained an implementation scheme to harmonize the RCRA and CAA programs to the maximum extent permissible by law. In pursuing a common-sense approach towards this objective, the proposal sought to establish a framework that: (1) Provides for combined (or at least coordinated) CAA and RCRA permitting of these facilities; (2) allows maximum flexibility for regional, state, and local agencies to determine which of their resources will be used for permitting, compliance, and enforcement efforts; and (3) integrates the monitoring, compliance testing, and record keeping requirements of the CAA and RCRA so that facilities will be able to avoid two potentially different regulatory compliance schemes.

II. Overview of Today's Notice

The Agency received a large number of public comments in response to the proposal. The Agency evaluated the public comments received and their applicability to the proposed rule. In those instances where comments provided new information or new insights, the Agency has reevaluated certain aspects of the proposal based on this new information. The Agency is issuing this NODA in an effort to inform the public of: (1) Significant changes the Agency is considering on aspects of the proposal based on public comments and new information; and (2) the Agency's own reevaluation (and to some degree narrowing) of MACT standard-setting approaches based on new data and (at least in part) on public comments.

Part Two: Standards for Hazardous Air Pollutants (NESHAPs)

I. Regulation of Area Sources

In this section, we solicit comment on making a positive area source finding to subject hazardous waste combustor area sources to the same MACT standards that would apply to major sources and on whether, under such a finding, area sources should be subject to Title V permit requirements.

A. Approach To Regulate Area Sources, as Proposed

A major source is a source that has the potential to emit (considering controls) either 10 tons per year of any hazardous air pollutant or 25 tons of any combination of HAPs. Area sources are any sources which are not major sources.

The Agency proposed to subject area sources to MACT standards under authority of CAA section 112(c)(6). See 61 FR at 17365. That section requires the Agency to subject to MACT standards [1] all sources in source categories that account for not less than 90 percent of the aggregate emissions of each enumerated pollutant. [2] The enumerated pollutants emitted by hazardous waste combustors (HWCs) include mercury (Hg), D/F, and other polycyclic organic HAPs. The Agency explained at proposal that HWCs were significant emitters of D/F and Hg, and that much of the human health risk from emissions of HAPs from HWCs comes from these high priority HAPs, and D/F in particular.

We received many comments pertaining to this part of the proposal, and we will address those comments in the final rule. The area source issue is discussed in today's notice because commenters said that another, more appropriate reading of section 112(c)(6) is that this authority could be used to apply MACT control to area sources only for the enumerated HAPs, not the full array of HAPs that the Agency proposed to regulate (e.g., particulate matter (PM), semivolatile metals (SVM), low volatile metals (LVM)). Nonetheless, were EPA to adopt this reading, the Agency continues to believe that area sources need to be regulated for this full array of HAPs.

In light of issues commenters raised, we solicit comment on an alternative approach that would subject area sources to all of the MACT standards for major sources based on the Agency making a positive area source finding.

B. Positive Area Source Finding For HWCs

Area sources must be regulated by technology-based standards [3] if the area source category is listed pursuant to section 112(c)(3) based on the Agency's finding that these sources (individually or in the aggregate) present a threat of adverse effects to human health or the environment. Such a finding is termed a positive area source finding. The Agency is today soliciting comment on whether a positive area source finding is appropriate for hazardous waste incinerators and hazardous waste burning cement kilns and lightweight aggregate kilns.

A positive area source finding would be based on the risk assessment performed for the proposed rule and ultimately the final rule. Even though the sources modeled in support of the proposed rule may have met the definition of a major source, EPA believes their HAP emissions, other than HCl, are also representative of area source emissions. This is because, as discussed below, these example sources may be able to reduce their HCl emissions to become area sources without reducing emissions of D/F, Hg, or other metal HAPs that could pose significant health risk.[4]

Many comments were submitted on the risk assessment methodology used to support the proposed rule. We are considering these comments in development of the final rule and are making appropriate changes to the risk methodology, including modeling additional facilities. These changes could affect the Agency's findings for both major and area sources. The Agency is not today reopening the comment period on the risk assessment.

1. Risks that could be posed by area source incinerators. We showed at proposal that baseline emissions from incinerators could pose high end individual lifetime cancer risks from D/F up to 9E–5. See 61 FR at 17389. In addition, although the risk from low volatile metals (i.e., As, Be, Cr, and Sb) was not estimated to exceed 4E–6, the example sites modeled were not representative of the short stacks of many on-site incinerators. The direct inhalation component of the individual cancer risk estimates may increase when incinerators with short stacks are included in the risk assessment supporting the final rule.

2. Risks that could Be posed by area source cement kilns. The Agency showed at proposal that baseline emissions from cement kilns could pose high end individual lifetime cancer risks from D/F up to 9E–5. See 61 FR at 17402. Although several high D/F-emitting cement kilns have recently reduced their D/F emissions significantly, a revised risk assessment may well show that cement kilns (both area and major sources) can pose significant health risk at current emission levels.

3. Risks that could Be posed by area source lightweight aggregate kilns. Although the Agency did not show high baseline D/F cancer risks for LWAKs at proposal, the risk assessment assumed extremely low D/F emissions—0.04 ng TEQ/dscm—based on very limited data from a single LWAK. However, as discussed below in section II.G, new data from two additional LWAKs show substantially higher emission levels—up to 4.1 ng TEQ/dscm. At these emission levels, the high end individual lifetime cancer risk from D/F could exceed 1E–5.

4. Basis for a positive area source finding. In evaluating these estimated risk levels to determine whether they are sufficient to make a positive area source finding, the Agency considered other factors which EPA believes to be relevant in determining how to exercise its discretion regarding area source determinations for these sources:

a. HWC area sources can pose the same hazard to human health or the environment as major sources. An area source may have the same emission rates of HAPs other than hydrogen chloride (HCl, the principal HAP that causes a HWC to be a major source) as a major source, and thus pose essentially the same hazard to human health or the environment. In other words, sources could have HCl emissions low enough to avoid a major source classification, but have emissions of D/F that could pose a health risk given that there is no direct correlation between HCl and D/F emissions.[5]

In addition, some HWCs that would currently be classified as major sources because of their HCl emissions may be able to lower their HCl emissions to become area sources. The Agency projects that all LWAKs are currently major sources principally because of their HCl emissions, and that approximately 80 percent of cement kilns are major sources, again because of HCl. These HWCs may be able to lower their HCl emissions to otherwise become area sources.[6]

Sources have until the compliance date of the MACT standards (i.e., three years after publication in the **Federal**

[1] For area sources, section 112(c)(6) requires the Agency to establish either MACT standards under section 112(d)(2), or generally available control technology (GACT) standards under section 112(d)(5). Given the similarities between major and area source HWCs as discussed in subsequent sections of the text, area sources should be subject to MACT.

[2] Section 112(c)(6) enumerates the following high-priority hazardous pollutants for special regulation: alkylated lead compounds, polycyclic organic matter, hexachlorobenzene, mercury, polychlorinated biphenyls, and 2,3,7,8-tetrachlorodibenzofurans and p-dioxin.

[3] That is, MACT standards under section 112(d)(2) or GACT standards under section 112(d)(5).

[4] From a technical perspective related to the nature of common air pollution control devices, reducing HCl emissions would not generally reduce emissions of other HAPs.

[5] For well-designed and operated combustion systems, D/F emissions are related primarily to post-combustion particle surface catalyzed reactions and the temperature of the combustion gas (the optimum temperature window for formation is 450–750 °F), virtually irrespective of HCl concentrations in the gas.

[6] Some commercial incinerators may also be able to lower their allowable HCl emission levels to become area sources. It could be more problematic for on-site incinerators to lower their emissions to become area sources because facility-wide HAP emissions must be considered when making the major/area source determination. For example, on-site incinerators located at large chemical production facilities would need to reduce HAP emissions at a large number of sources.

Register) to make a major source determination. Many kilns spiked chlorine in the hazardous waste feed during compliance testing to get approval to feed chlorine (and emit HCl/Cl2) at levels ostensibly higher than normal. Given that sources ''have the potential to emit'' at these ostensibly higher than normal emission rates, these emission rates must be used for the major source determination. See CAA section 112(a)(1), definition of major source. These sources may be able to operate successfully at lower allowable chlorine feedrates and emission rates, however. If so, they can elect to retest their units and base the major/area source determination on potentially lower HCl/Cl2 emission rates.

b. RCRA sections 3004(o)(2) and 3004(q) essentially command regulation of all HWCs. Under this RCRA mandate, the Agency has regulated all (i.e., both major and area sources) hazardous waste incinerators since 1981 (see 46 FR 7678 (Jan. 23, 1981) as amended at 48 FR 14295 (Apr. 1, 1983)) and all hazardous waste burning cement and lightweight kilns since 1991 (see 56 FR 7134 (Feb. 21, 1991)). Deferring regulation of HWCs to the CAA would not be appropriate unless all HWC sources were covered. In addition, although somewhat more than half of the commercial incinerators appear to be area sources, the majority of on-site incinerators are likely to be major sources.[7] The public expectation is that all HWCs would continue to be regulated.[8]

c. MACT controls are reasonable and appropriate for both major and area sources. The emission control equipment (and where applicable, feedrate control) defined as floor or beyond-the-floor (BTF) control for each source category is applicable and appropriate to area sources. There is nothing unique about the types and concentrations of emissions of HAPs from area sources versus major sources that would make MACT inappropriate for an area source.

d. Area source HWCs contribute significantly to D/F and Hg emissions. Both area and major source HWCs contribute significantly to aggregate emissions of D/F and Hg, two high priority HAPs. See CAA section 112(c)(6) and proposal discussion at 61 FR at 17366.

For these reasons, the Agency is taking comment on making positive area source findings for each of the three source categories covered by the proposal. Again, the effect would be to subject all sources within these categories to MACT standards, which also would be the effect of the original proposal.

C. Title V Permitting Requirements for Area Sources

Under § 63.1(c)(2), area sources subject to MACT (or GACT) are subject to the requirement to obtain a Title V permit unless the standard for the source category (e.g., Subpart EEE for HWCs) specifies that: (1) States will have the option to exclude area sources from Title V permit requirements; or (2) States will have the option to defer permitting of area sources. The Agency has determined that if it makes a positive area source finding and subjects area sources to MACT standards as discussed above, the Agency would also consider subjecting area sources immediately to Title V permitting requirements, as provided by § 63.1(c)(2)(iii). The Agency has determined that area source compliance with Title V permit requirements would not be ''impracticable, infeasible, or unnecessarily burdensome''. See CAA section 502(a). As noted above, area sources can be virtually identical to major sources with respect to size, type of combustor, and commercial versus on-site status, except that their mass emissions of HCl are lower. Thus, waiver of Title V permitting would not be warranted.

In addition, if the Agency were to waive the Title V permit requirement for area sources, we would be concerned about the confusion it would likely create for the regulated community and the public if the air emissions standards for some hazardous waste combustors (even in the same source category) were addressed in the Title V permitting process and the air emissions standards for others were addressed in the RCRA permitting process. Since a source can make modifications to their emissions levels that could change their major/area source determination, a source could move from one permitting program to the other, creating difficulties for the permitting agencies in tracking sources and for the public in trying to participate in or follow the permitting process. Therefore, it appears most appropriate from an implementation standpoint to subject area sources to Title V permitting. In this way, all HWCs (both major and area sources) would be subject to the same Title V permitting requirements.

II. Revisions to Proposed Standards Using the Revised Emissions Database and Data Analysis Methods.

In this section, the Agency discusses comments on the revised emissions database and the revised standards that would result from applying an engineering evaluation and data analysis methods to that revised database. In addition, we discuss several issues that are generic to the MACT standards for all three source categories: (1) Consideration of PM as a surrogate for non-Hg metal HAPs; (2) options for controlling emissions of organic HAPs; and (3) emissions variability.

A. Notice of Data Availability on the Revised Emissions Database

On January 7, 1997 the Agency published a NODA on an updated database of emissions and ancillary information. See 62 FR 960. The Agency updated the database used at proposal to correct errors and include additional emissions data. The NODA explained that the updated database would be used to identify MACT standards for the final rule and to evaluate economic impacts and, for RCRA purposes, risks associated with the final MACT standards.

The Agency received comments on the revised database from 16 stakeholders representing the cement industry, lightweight aggregate industry, and on-site and commercial incinerators. The database was revised again to accommodate the comments received on the database NODA. The Agency then re-analyzed the database to determine the MACT floor standards discussed below.

We received several specific comments (i.e., as opposed to generic and undocumented comments that, for example, the Agency's data are inconsistent with the commenter's) that were not accompanied with supporting documentation. Most of these comments pertain to miscellaneous data on feedstream feedrates and equipment design information that do not have a significant impact on developing MACT floor standards under the data analysis methods discussed in today's NODA. Where there was a significant possibility that the data might affect the Agency's determinations, references were re-checked to determine the more accurate number to be used.

The Cement Kiln Recycling Coalition (CKRC) provided an extensive run-by-run, HAP-by-HAP comparison of the Agency's database with theirs. While

[7] Only approximately 30 percent of incinerators appear to be major sources. This estimate is based on only the incinerators' stack emissions, however. Given that facility-wide emissions of HAPs are considered when making a major source determination, many on-site incinerators are likely to be classified as major sources because they are located at large petrochemical facilities.

[8] It would be particularly problematic from a RCRA perspective for commercial incinerators that are area sources to be exempt from MACT standards.

potentially useful in some cases, their submission unfortunately did not distinguish between significant versus insignificant differences; nor did they verify which data were more accurate for the purposes in question. Within current time constraints, the Agency has identified which appear to us to be significant and relevant differences and then checked these data to determine which appear to be more accurate and has made necessary changes. The current database, as updated and revised, is appropriate and sufficient considering the engineering and data analysis methods discussed below to identify MACT standards. For example, although there may still remain differences between CKRC's and the Agency's database regarding electrostatic precipitator (ESP) and fabric filter design and performance characteristics, those characteristics are not germane to the engineering and data analysis methods for determining relevant MACT standards, as discussed below. In these situations, the Agency has elected not to revise inconsequential data, particularly where it is not clear which data are more accurate.

Some overall decisions on data quality issues have also been made for purposes of revising the database. Regarding assigning values to reported nondetects, we are assuming that nondetected values were present at one-half the detection limit. We considered assuming nondetected values were present at the full detection limit, but found in most cases no significant difference in the MACT data analysis results. It represents a judgment by the Agency based on its experience that, for assessing standards and risk, this more conservative approach increases our confidence that standards and risk are appropriate and acceptable.

In addition, we are excluding data from sources no longer burning hazardous waste, as suggested by several commenters on the proposed rule. Although such data may well be indicative of the capabilities of control equipment and thus relevant, the resulting database is still large enough to ensure that potential final MACT standards can be judged to be achievable (or not as the case may be) without including these more controversial data. Regarding older emissions data when more recent data was available for a source, we are considering all data sets for sources that currently burn hazardous waste. Both recent and old data are instructive in assessing the capabilities of the control equipment at these operating facilities.

Finally, we screened out so-called ''normal'' emissions data from the MACT analyses. Although doing so may appear counterintuitive at first blush, one must consider that facility compliance will generally be based on operating limits established during the MACT performance test (except if compliance is based on a continuous emissions monitoring system (CEMS)). During these MACT performance tests, sources will likely operate under the same worst-case conditions as they did during trial burns and Boiler and Industrial Furnace (BIF) rule certification of compliance testing. Operating under worst-case conditions with respect to emissions and operating parameters gives operators a wide allowable envelope of operating limits needed to efficiently and economically operate the combustor and yet maintain compliance. Considering normal emissions data in the MACT analysis could inappropriately result in the Agency establishing a MACT standard based on normal emissions and conditions while the source would be operating under worst-case conditions to demonstrate compliance. Thus, emissions while complying with operating limits would be inappropriately constrained to below current normal emission levels, even for sources equipped with well-designed and operated MACT floor control.

B. PM as a Surrogate for Non-Hg Metals

The Agency proposed a MACT PM standard as a surrogate for non-D/F organic HAPs (that are adsorbed onto the PM) and for the metal HAPs not individually regulated under the proposed metal standards (i.e., Co, Mn, Ni, and Se). See 61 FR at 17376.

Since proposal, the Agency has reconsidered in the context of this joint RCRA-CAA rulemaking whether a MACT PM emission standard could serve as a surrogate for six non-Hg metal HAPs for which the Agency did propose specific standards—semivolatiles (Cd and Pb) and low volatiles (As, Be, Cr, and Sb). This issue arises, in part, because the risk assessment at proposal on the MACT standards estimated that the high-end individual lifetime cancer risks using 90th percentile metal emission levels were well below 10^{-6} for cement kilns and LWAKs. For incinerators, the highest estimated cancer risks exceeded 10–6 but were below 10^{-5}.[9]

To evaluate PM as a surrogate for non-Hg metals in the context of this joint RCRA-CAA rulemaking, questions that must be addressed are: (1) Would a MACT PM standard control the six non-Hg metals to MACT emission levels in the special context of hazardous waste combustors; and (2) would there be significant health risk at MACT emission levels that would have to be addressed with RCRA controls (based at least in part on site-specific risk assessments using omnibus authority)?

Because, in the case of hazardous waste combustors, there are significant levels of metals in the hazardous waste-derived fuel being burned, the Agency has initially concluded that a MACT PM emission standard in this particular rule may not adequately control the six non-Hg metals to the nominal MACT emission levels. The residual risk that could result from emissions of some of the six non-Hg metals could be significant[10], and regulation of these problematic metals under RCRA would therefore be warranted. From an implementation standpoint, this result of mixed statutory controls is not desirable. Although establishing six additional specific limits on the non-Hg metals eliminates this particular implementation disadvantage, this would add to the compliance and implementation burdens on facility and regulator alike. Consequently, it does not currently appear appropriate to use PM as a surrogate for all six toxic, non-Hg metals.

In investigating this issue, however, we determined that antimony (Sb), one of the four low volatile metals, may not warrant direct control. That is, the MACT PM standard may serve as an adequate surrogate for Sb to ensure that it is not emitted at levels that pose a health risk.[11] We also considered whether beryllium (Be), another LVM, warranted control given that it is not generally present in significant concentrations in hazardous waste, and baseline emissions of Be do not appear to be posing a health hazard. Given that Be is a toxic carcinogen, however, direct MACT controls should be provided even if current feedrates (and emission rates) are low.

Only a preliminary analysis (see discussion below) was used to investigate whether some of the

[9] Note, however, that the example incinerators modeled for the risk assessment had relatively tall stacks which may not result in the higher ground level concentrations (and thus higher direct inhalation risk) that could result from small incinerators.

[10] This is at least partly because a PM control device alone does not give the same targeted degree of control for individual metals that a combination of metal feed control plus a PM control device does.

[11] Sb is a non-carcinogen with relatively low toxicity compared with the other five non-Hg metals, and would have to be present in hazardous waste (and emitted PM) at extremely high levels (perhaps over 1000 times the current levels) to pose a health hazard. Current data suggest that metals feedrates generally are either not increasing or increasing at much lower rates.

remaining semivolatile and low volatile metals—Cd, Pb, As, and Cr—may warrant only indirect control through a PM standard for any or all of the HWC source categories. We continue to believe that direct standards are warranted for these four metals (either individually or in volatility groups). For purposes of public comment, we have identified MACT standards for these individual metals in case individual standards are ultimately deemed more appropriate than continuing to group the metals by relative volatility. However, we remain concerned about the compliance and implementation complexities that would be introduced. (See the discussion below of revised SVM and LVM standards for each source category.)

We solicit further comment on how to ensure appropriate and effective control of non-Hg metal HAPs while ensuring that the regulatory scheme and associated compliance elements are implementable and not unnecessarily burdensome. Some of the pertinent issues are highlighted below for commenter response.

1. *Can PM serve as a surrogate for SVM and LVM?* A MACT PM standard would provide MACT emissions control technology (i.e., the air pollution control device) for non-Hg metals. This is because stack emissions of non-Hg metals in combustion gases are controlled by the PM control device. Thus, MACT control (i.e., the emission control device) for PM would also be MACT control for non-Hg metals.

However, emissions of non-Hg metals from HWCs are also controlled by the feedrate of non-Hg metals (for kilns, the feedrate of non-Hg metals in hazardous waste) in addition to the PM control device. Thus, a MACT PM standard alone may not result in control of non-Hg metals to MACT emissions levels because emissions of non-Hg metals will vary at a given PM level as feedrate varies (i.e., emissions of non-Hg metals will be a greater percentage of PM emitted as the feedrate rises).

Some commenters have argued that PM is not a good surrogate for non-Hg metals emissions. When sources (within a source category) are considered in the aggregate, a poor correlation between PM and non-Hg metals emissions appears to exist. This is because sources have various feedrates of the metals and because different types of PM control devices have different collection efficiencies for these metals.[12], [13] Nonetheless, at a given source with a given non-Hg metal feedrate, metal emissions will correlate with PM emission levels. Although the correlation will be different for more volatile versus less volatile metals, emissions of these metals will increase as PM emissions increase.

In summary, although there is a correlation between PM and non-Hg metal emissions on a facility-specific basis, and the MACT PM standard likely would ensure use of MACT emission control device for these metals, it may not ensure attainment of MACT emission levels of these metals. Given the potential for HWCs to emit high levels of some of these metals, metal-specific emission controls—MACT standards—are warranted either individually or in volatility groups.

2. Which non-Hg metals warrant specific control by establishing MACT emission standards? As an alternative to establishing MACT standards for SVM and LVM as proposed, we are re-evaluating which non-Hg metals warrant special control and whether to establish individual MACT emission standards for them.[14] As discussed above, our preliminary analysis indicates that standards may not be warranted for Sb. We are continuing to investigate whether any of the remaining metals—As, Be, Cd, Cr, and Pb—may not warrant direct emission standards but may warrant only indirect controls via the PM standard. Further, we are investigating how the metal standards should be structured: (1) MACT standards for individual metals; or (2) MACT standards for volatility groupings (SVM and LVM) if we determine, as currently contemplated, that direct standards for all five remaining metals are warranted (i.e., as proposed).

For cement kilns and LWAKs, we examined a comparison of potentially allowable emission levels for non-Hg metals under the BIF rule and actual allowable (i.e., levels emitted during Certificate of Compliance (CoC) testing) emission levels. (Note that the actual allowable levels are generally much higher than normal emission levels because sources spiked metals during CoC testing.) A wide margin exists—generally an order of magnitude or greater—between BIF potentially allowable emission levels and CoC allowable emission levels. This means that: (1) Cement kilns and LWAKs are not emitting these metals at levels posing a risk using BIF risk assessment procedures; and (2) cement kilns and LWAKs are feeding these metals at rates well below those that would be allowed under BIF risk-based limits and, thus, indirect PM control under MACT may similarly keep feedrates (and emission rates) of these metals low.

We also examined data on the percentage of emitted particulate matter that each non-Hg metal would have to comprise to pose a health risk, assuming BIF risk assessment procedures were applied. Under this analysis, Pb and Sb would have to comprise from 10–100 percent of emitted PM to pose a health risk. Data suggest that these percentages are not approached in today's operations by a wide margin.

These preliminary analyses were performed assuming BIF risk assessment procedures. Thus, our evaluation may not be representative of results that will be forthcoming shortly using updated, more detailed procedures for evaluating risks under the final MACT standards. For example, the risk assessment for this rule considers indirect exposure (i.e., ingestion and food-chain uptake) while BIF procedures consider only direct inhalation. On the other hand, BIF direct inhalation exposure assessment procedures are more conservative (i.e., result in a higher estimate of risk) than those that will be used for the final MACT standards because the Agency has revised those procedures in part to consider more realistic exposure scenarios. Nonetheless, the analyses discussed above are viewed as suggestive that regulation of each and every semivolatile and low volatile metal as proposed may not be warranted.

We could not perform similar preliminary analyses for incinerators because we do not have dispersion coefficients readily available that would be representative of the short stacks used by many on-site incinerators. However, a review of the emissions database indicates that, as expected, some incinerators—both commercial and on-site incinerators—emit much higher levels of these metals than cement kilns or LWAKs. Nonetheless, we may find (as may be the case for cement kilns and LWAKs) that Sb may not warrant a direct metal-specific standard for incinerators as well, either as part of the LVM group or an individual standard.

[12] In addition, metal collection efficiency of the PM control device varies at different metal feedrates.

[13] See, for example, comments submitted by Chemical Manufacturers Association, RCRA Docket # F–96–RCSP–FFFFF comment # RCSP–00128.

[14] Other metal HAPs (other than Hg and the six toxic metals covered at proposal) would be controlled indirectly by the PM standard and any individual or volatility group metal standards. This is essentially unchanged from the proposal.

C. Options for Controlling Emissions of Organic HAPs

Based on evaluation of the revised emissions database, the Agency is soliciting comment on options to control emissions of organic HAPs by: (1) Establishing MACT standards for carbon monoxide (CO) and/or HC emissions as surrogate indicators of good combustion conditions;[15] and (2) ensuring that sources achieve 99.99 percent destruction and removal efficiency (DRE).[16] These options are presented in Part Three: Implementation, Sections II and III, because the DRE issue has implementation implications, and the CO/HC issue relates to the DRE issue.

D. Accounting for Emissions Variability in Establishing Emission Standards

At proposal, the Agency used a statistical approach to identify an emission level that MACT floor control could achieve routinely considering that the emissions database was comprised of ''short-term'' test data. See 61 FR at 17366. To identify an appropriate standard, a computed variability factor considering within-test condition emissions variability was added to the log-mean of the highest test condition average for any source using floor control. The log-mean of the runs for the standard-setting test condition is the ''design level'—the emission level the source would be designed to meet to ensure emissions were less than the standard 99 percent of the time, assuming a source had average within-test condition emissions variability (average based on all sources using floor control).

We are concerned that this computed variability factor approach may be inappropriate in this particular rulemaking.[17] For example, this computed variability factor led to illogical results for the PM standards for incinerators and LWAKs. In the case of PM, the calculated standard using the computed variability factor is 50 percent higher than the current legally-mandated RCRA PM limit for incinerators. For LWAKs, using the variability factor results in a PM standard of approximately 0.04 gr/dscf (corresponding to a design level of 0.022 gr/dscf) nearly twice as high as any PM emission value in the entire LWAK database. Further, given that floor control would be a fabric filter, our engineering evaluation[18] (and the LWAK database itself) indicates that a fabric filter can readily achieve levels of 0.022 or below, not the calculated 0.04.

These inappropriate and illogical results may flow from either the variability factor itself or the test condition average identified as the standard-setting test condition (to which the variability factor is added). For example, the variability factor itself (which considers within-test conditions emissions variability) could be inappropriately high if there are outlier runs within test conditions that are not screened out. Although runs in many test conditions appear to be outliers (and analytical tests may show them to be outliers) it can be difficult to justify screening them out unless there is a specific technical explanation (e.g., unique design or operation feature or inadequacy) that can be identified. Unfortunately, this information is often not available for many potential outlier data.

As noted, identifying the standard-setting test condition inappropriately could be a factor. We have very limited information on the design, operation, and maintenance characteristics of the emission control devices and combustors. Accordingly, we have had to define MACT floor control very generically (e.g., ESP or fabric filter), as discussed below, without attempting to specify design, operation, and maintenance characteristics.

Given these concerns and the statute's direction to establish the maximum but achievable floor standard, we request comment on an alternative approach to account for emissions variability. This alternative has two elements. First, when a large data set from sources using floor control[19] exists, the range of emission levels from those sources should adequately reflect emissions variability. That is, a standard established as the highest test condition average for sources using floor control represents an emission level that the control technology is capable of achieving, considering normal variability in combustor operations, emission control device operations, and test methods. Where these data show that many sources using floor control can achieve well below the standard, this demonstrates that additional emissions variability considerations are not warranted. Source(s) with emission levels close to the standard should be able to determine how to emit at levels below the standard based on the specific design, operation, and maintenance information available to them, especially since many other sources with the same basic equipment are doing so.[20] Second, where only a small set of data from sources using floor control exists, the range of emission levels from these sources may be less likely to reflect emissions variability. In this case, consideration of an additional variability factor (to be added to the highest test condition average for a MACT-control facility) may be appropriate.

The impact of this alternative approach has been examined. We do not have a large data set in the expanded universe for two standards: D/F standards for incinerators equipped with waste heat recovery boilers and D/F standards for LWAKs. In each case, we have data from only three sources, and consequently floor control is based on the suite of controls used by all three sources.[21] If the data set were large, we would identify the floor level as the test condition with the highest run average. But, given the small data set, it is reasonable from an engineering vantage point to identify the standard as the highest single run for the highest test condition (when the unit was properly operated).

We discuss below engineering and data analysis methods and the resulting standards for each HAP and source category where a computed variability factor is not used to establish emission standards.

[15] The Agency proposed to establish MACT standards for both CO and HC, but solicited comment on whether a standard based on one surrogate or the other may be sufficient. See 61 FR at 17376.

[16] The Agency proposed to retain DRE as a RCRA standard because of concerns that it would be difficult to self-implement under MACT implementation procedures. See 61 FR at 17447. The Agency is reconsidering this issue and solicits comment on alternative approaches to ensure compliance with the DRE standard, including incorporating DRE as a MACT standard.

[17] See, for example, proposed rule (61 FR at 17367).

[18] See USEPA, ''Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database'', April 1997.

[19] Or, in the case of LWAKs, where the data set is essentially complete (i.e., where we have data from all or most of the sources in the source category).

[20] No patterns in process design or operation in the information we have explain why some sources thought to be using floor control had significantly higher emissions than other sources thought to be using floor control. Where floor control is based on an emission control device, these high emitters are likely not in fact using floor controls—considering the suite of design, operation, and maintenance factors that affect performance of the control equipment but on which the Agency has no data. Where floor control is based on finite control such as combustion gas temperature or feedrate control, the high emitters may be experiencing emissions during the compliance test on the high end of the range of emissions variability.

[21] When data are available from fewer than 30 sources, MACT floor is defined as the median emission limitation achieved by the best five performing sources. Thus, the best performing three sources (representing the median (and better performers)) define MACT in this case.

Finally, we are using an engineering evaluation to identify a design level for each standard for purposes of estimating economic impacts and, for RCRA purposes, the risk associated with the design level for a given MACT standard. The design level is the emission level to which the control equipment must be designed to ensure compliance with the standard. For the RCRA risk analysis of the final MACT standards, we will analyze risks under the more realistic assumption that a source is emitting at the design level on average, rather than right at the standard all of the time.

Based on discussions with several air pollution control device vendors and facility operators, a design level of 70 percent of the standard is deemed appropriate because it is within the range of reasonable values that may be encountered—50 percent to 90 percent. To the extent that industry engineering experience suggest that a different design level assumption would be more typical and reasonable, we invite commenters to provide that information.

We also considered whether the design level as a percentage of the standard (i.e., design factor) should vary depending on whether the control is finite (e.g., temperature control or feedrate control) versus an emission control device that is affected by various parameters, or the type of emission control device (e.g., metals controlled by feedrate and an ESP or fabric filter). However, we do not have enough information to establish such tailored and case-specific design factors. If commenters supply sufficient information, we will consider using this approach.

As noted, we will use the design factor to estimate costs of retrofitting for all sources with emissions exceeding the standard. For these sources, we will estimate the costs of upgrading emission control equipment to meet the design level. For sources using floor control (i.e., sources in the expanded universe) that have emissions greater than the design level, however, we will not attribute retrofit costs for compliance. Given that these sources are using floor control and that, as discussed above, the large data set of sources using floor control and meeting the floor standard amply accounts for emissions variability, we will presume that these relatively high emissions for such floor-controlled sources represent the high end of the range of emissions variability. In other words, when these sources retest emissions under the same conditions, their emissions should meet the standard.

E. Re-Evaluation of Proposed MACT Standards for Incinerators

We discuss in this section the basis for the revised standards for incinerators that result from applying engineering and data analysis to the revised emissions database. We also discuss refinements to analytical approaches used in the proposal for identifying floor controls and levels.[22] A comparison of the originally proposed and potentially revised standards for existing and new sources is presented in the table below:

TABLE II.E.—REVISED STANDARDS FOR EXISTING AND NEW INCINERATORS [1]

HAP or HAP surrogate	Existing sources		New sources	
	Proposed standard	Revised standard	Proposed standard	Revised standard
D/F (ng TEQ/dscm)	0.20	0.20	0.20	0.20
Hg (µg/dscm)	50	40	50	40
PM (gr/dscf)	0.030	0.015	0.030	0.015
HCl/Cl2 (ppmv)	280	75	67	75
CO (ppmv)	100	100	100	100
HC (ppmv)	12	10	12	10
SVM (µg/dscm)	270	100	62	100
LVM (µg/dscm)	210	55	60	55

[1] All emission levels are corrected to 7% O_2.

1. *Subcategorization considerations.* Since proposal, the Agency has refined potential options for subdividing the incinerator source category to determine if subdivided standards would be appropriate: (1) Small [23] versus large sources; (2) commercial versus on-site sources; and (3) small on-site sources versus large on-site and commercial sources. In large part, commenters believed that small, on-site incinerators should have less stringent standards to reduce costs of compliance. However, given that our analysis shows that the revised standards for the small on-site sources would either remain the same or be more stringent under these options, we continue to believe that subdividing would be inappropriate.[24]

We also received comments from the US Department of Energy (DOE) suggesting that DOE's mixed waste [25] incinerators had several unique features (discussed below) that would warrant subcategorization.[26] We are investigating whether DOE's incinerators pose unique implementation and compliance problems and therefore are considering several options for the final rule: (1) no subcategorization; (2) subcategorization for mixed waste incinerators; and (3) deferral of MACT regulation for mixed waste incinerators (with RCRA rules continuing to apply).

Under the No Subcategorization Option, we would find that the MACT controls and emission standards applicable to other incinerators are appropriate for DOE's mixed waste incinerators. Under this option we could still define special compliance requirements that account for any unique features of mixed waste incinerators.

[22] Additional details of the engineering and data analysis evaluations performed on the revised emissions database can be found in the Agency's background document: USEPA, ''Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database'', April 1997.

[23] An analysis of gas flowrates in actual cubic feet per minute (ACFM) indicated that a maximum flowrate of 20,000 acfm would be within the range of values that could be selected to designate small versus medium incinerators. We performed a similar analysis at proposal and selected a flowrate of 23,127 to designate small incinerators. See 61 FR at 17372.

[24] The Agency requested at proposal comments on other means of reducing costs to small, on-site incinerators (e.g., waiving requirements for CEMS). We will consider all submitted comments on options to reduce costs on these units in the final rule.

[25] Mixture of low level radioactive waste and hazardous waste.

[26] See summary of DOE/EPA meeting at RCRA Docket # F–96–RCSP–FFFFF item # S00270.

Under the Subcategorization Option, we would find that because of unique design or operating features, the MACT controls or emission standards identified for other incinerators are not appropriate for mixed waste incinerators. MACT standards unique to these incinerators would be developed, and special compliance requirements could be defined.

Under the Deferral Option, we would determine that we do not have the resources to make an appropriate MACT determination on mixed waste incinerators in time to meet the schedule for the HWC rulemaking (i.e., the Phase I rule establishing MACT standards for incinerators, cement kilns, and LWAKs). Regulation of mixed waste incinerators would be deferred to the Phase II rule where the Agency will establish MACT standards for hazardous waste burning boilers, halogen acid furnaces, and sulfur recovery furnaces. The RCRA rules which now apply would continue to do so.

DOE suggests that its mixed waste incinerators have several unique features that would require subcategorization and special compliance standards:

• Each of DOE's four conventional incinerators meet the Agency's definition of small incinerators (i.e., <20,000 acfm gas flow rate), and one is batch-operated only once or twice a year with a gas flow rate of 3,000 acfm.

• Several mixed waste thermal treatment units meeting the Agency's definition of an incinerator are small vitrification devices designed to process metal bearing wastes and feed wastes with extremely low organic content.

• Given that most of the mixed waste incinerators are very small units, a mass-based emission limit would be more appropriate than a concentration-based emission limit.

• Approximately 95 percent of the mixed waste that is incinerated is "legacy waste" generated during production of nuclear weapons from 1943 until 1989 and may contain high levels of mercury that cannot be lowered by source reduction.

• Control of mercury emissions using activated carbon injection (ACI) would be problematic because the spent carbon would be a mixed waste, and if it contained more than 260 ppm of mercury, mercury retorting would be required under the Agency's land disposal restrictions even though there are no retorters in the country that manage mixed waste (and so a variance would have to be obtained under § 268.44).

• Given that CEMS are not yet demonstrated for multi-metals (and a CEMS requirement for mercury alone is also problematic for the final Phase I rule), compliance with MACT metal emission limits would be based on feedrate limits for metals in feedstreams, a potentially unworkable approach for mixed waste since sampling and analysis of radioactive feedstreams raises serious human health concerns.

• DOE has negotiated plans and agreements with States under Site Cleanup Agreements mandated by RCRA section 3021(b) and CERCLA section 120(e), and such plans and agreements would probably require renegotiation (and delay) to comply with the proposed MACT standards.

The Agency is continuing to investigate these issues and will make a determination regarding the appropriate regulatory option in the final rule.

2. *Dioxins and Furans (D/F)* a. MACT floor for existing sources. We proposed a MACT floor standard of "0.20 ng TEQ/dscm or gas temperature at the PM control device ≤400°F" based on floor control of temperature at the PM control device. During subsequent analysis of the revised database, we noticed again that incinerators equipped with waste heat boilers have significantly higher D/F emissions than other incinerators. This is likely because the heat recovery boiler precludes rapid temperature quench of combustion gases to a temperature of ≤400°F (usually with a wet scrubber), which would be floor control for non-waste heat boilers. Floor control for waste heat boilers would be rapid quench of combustion gases at the exit of the boiler to a temperature of ≤400°F.

Based on the revised database, the floor standard for waste heat boilers would be "0.20, or 12 ng TEQ/dscm and a temperature of ≤400°F at the PM control device." Given that the waste heat boiler expanded universe (i.e., the entire database) is comprised of only three sources, the highest single run for the test condition with the highest run average is a reasonable floor level. (Note that if this were a large data set, we would define the floor level simply as the highest test condition average.) This floor level is 50 percent higher than the highest test condition average, and thus appears to be a level that waste heat boilers should be able to meet routinely using floor control.

The floor standard for non-waste heat boilers would be "0.20, or 0.40 ng TEQ/dscm and a temperature of ≤400°F at the PM control device." This standard is based on arraying emission levels for sources using floor control and screening out four test conditions with anomalously high emissions. Three of these test conditions were from sources for which we had other test conditions with emissions averages well below 0.40 ng TEQ.

We did not originally propose separate standards for waste heat boilers because the floor standard at proposal was "0.20 ng TEQ/dscm or temperature at the PM control device of <400°F." Waste heat boilers could meet that standard, and moreover, we proposed a BTF standard of 0.20 ng TEQ/dscm for all incinerators (a preference we do not depart from in today's notice). Today, however, we are presenting the option of stating the standard in the form of a TEQ level combined with a maximum temperature at the PM control device. This form of the standard is consistent with the revised data, and would result in somewhat lower emissions. This is because, without the TEQ limit, some sources could exceed that TEQ level at the specified temperature.

b. BTF considerations for existing sources. Incinerators can be equipped with ACI at temperatures ≤400 °F to achieve D/F levels below 0.20 ng TEQ/dscm. Given the limited application of the technology to control D/F emissions from hazardous waste incinerators and given that control efficiency is likely to decrease at D/F emission levels below 0.20, a BTF standard of 0.20 ng TEQ/dscm would continue to be appropriate. See proposal for extended discussion, 61 FR at 17382.

Another option arising from the refinement of our original analysis is to establish a BTF standard for waste heat boilers at "0.20, or 0.40 ng TEQ/dscm and a temperature of ≤400 °F at the PM control device", and to remain at the floor standard for non-waste heat boilers. These standards would ensure that most, but not all, sources would have emissions ≤0.20 ng TEQ/dscm. Given that only a few sources would need to take additional measures to get their emissions below 0.20, however, it would be appropriate to establish a 0.20 BTF standard, assuming this level remains appropriate after considering statutory factors for establishing standards more stringent than the floor.

c. MACT floor for new sources. At proposal, we identified the same floor control for new sources as for existing sources: wet scrubbing and ≤400 °F at the PM device. This is because the sources with the lowest emissions used this control. In re-evaluating the database for this NODA, however, an engineering evaluation may be more appropriate to identify ACI as floor control because one source (i.e., the single best controlled source) uses it. Even though most sources using rapid quench by wet scrubbing can achieve D/F levels less than 0.20 TEQ, some sources using wet scrubbing have higher D/F levels. ACI operated at 400 °F or lower can universally achieve D/F levels of 0.20 ng TEQ/dscm or less and is thus the better performing technology. (Note that waste heat boilers cannot use rapid quench of combustion gases but can use ACI.)

Although the source equipped with ACI (Waste Technologies Industries) is achieving D/F levels of 0.07 ng TEQ/dscm, we believe that it is appropriate to conclude that ACI can routinely achieve a standard of 0.20 ng TEQ/dscm given the limited application to date of the technology for hazardous waste incinerators and the uncertainties about how much ACI control efficiency is reduced at extremely low D/F emission concentrations. However, we specifically invite comment on the potential levels that can be reached with ACI, and on industry-wide achievability of 0.07 ng TEQ/dscm as the floor for new sources.

d. *BTF considerations for new sources.* At proposal, BTF for new sources was based on performance of ACI given that floor control was based on performance of rapid quench. Under today's analysis, MACT floor for new sources would be based on ACI. Although carbon beds would be able to achieve lower emissions, they are not thought to be cost-effective (particularly if the floor for new sources was well below 0.20 ng TEQ/dscm), and a BTF standard would likely not be appropriate.

3. *Mercury (Hg).* a. MACT floor for existing sources. At proposal, the Agency identified floor control as either (1) feedrate control of Hg at an maximum theoretical emission concentration (MTEC) not to exceed 19 μg/dscm, or (2) wet scrubbing with feedrate control of Hg at an MTEC not to exceed 51 μg/dscm. We proposed a floor standard of 130 μg/dscm.

Mercury emissions from incinerators are currently controlled by limiting the feedrate of Hg combined with some removal by air pollution control systems (APCS). There are two APCS techniques currently used by hazardous waste incinerators (HWIs) to control Hg: wet scrubbers and ACI. Although primarily intended for acid gas control, nearly all incinerators employ wet scrubbers that capture the soluble forms of Hg species (e.g., mercury salts). ACI is used by one incinerator for control of Hg (and D/Fs). The Agency also has data from one additional facility using ACI; however, these data were generated during a demonstration testing program.

Review of the updated Hg data in the revised database shows that feedrates vary substantially. Generally the higher feedrates are the result of Hg spiking. We re-evaluated the revised database for today's notice using a data analysis method similar to that used at proposal to determine floor levels: (1) Rank Hg emissions from lowest to highest; (2) define as floor control the air pollution control device (APCD) and associated highest Hg MTEC for the 6 percent of sources with the lowest emissions; and (3) define as the floor standard the highest test condition average emissions of any test condition operated at or below the Floor MTEC. Using the revised database, MACT control would be defined as wet scrubbing with a MTEC of 50 μg/dscm, and the revised floor standard would be 40 μg/dscm. Nearly 60 percent of HWIs for which we have data are achieving this level.

b. BTF considerations for existing sources. The Agency originally considered flue gas temperature reduction to 400 °F or less followed by ACI as the BTF option for improved Hg control. As discussed at proposal, EPA believes that ACI incinerator applications can achieve Hg emission reductions greater than 90 percent. In the Notice of Proposed Rulemaking (NPRM), the Agency proposed a BTF standard of 50 μg/dscm.

As mentioned above for existing sources, the Agency has in its database Hg data from one facility (with two test conditions) currently employing ACI as a permanent application. Both test conditions achieved Hg removal efficiencies between 97 and 98 percent at varying Hg feedrates. The Agency also has data from a second facility generated during a demonstration test that show about a 98 percent effectiveness at capturing Hg though at one of the highest feedrates in the database. These data, in addition to ACI applications on full-scale municipal waste combustors and medical waste incinerators,[27] support the Agency's assumption that ACI systems can readily achieve capture efficiencies of 90 percent or more on incinerators.

In light of the revised database, EPA can initially identify 4 μg/dscm as the potential BTF standard based on ACI and flue gas temperature reduction to 400 °F or less. This is based on a source achieving the floor level of 40 μg/dscm and then applying ACI with a 90 percent removal efficiency. However, a BTF level of 4 μg/dscm will likely raise significant cost-effectiveness considerations. Given that the floor level discussed today would be substantially lower than the proposed floor, a BTF standard of 4 μg/dscm would be less cost-effective than the BTF levels of 30 μg/dscm and 5 μg/dscm analyzed at proposal.

c. MACT floor for new sources. At proposal, the floor control for new sources was similar as for existing sources: wet scrubbing with feedrate control of Hg at an MTEC not to exceed 51 μg/dscm. We proposed a floor standard of 115 μg/dscm.

As discussed for existing sources, both wet scrubbing and ACI are used for Hg control. The single best performing source for Hg control in our database, measured by lowest emissions, is a wet scrubber with Hg feedrate, expressed as a MTEC, of 50 μg/dscm. Since MACT for new HWIs is identical to MACT for existing sources, analysis of emissions using these or better controls would result in a floor level for new HWIs of 40 μg/dscm.

The Agency also considered a MACT floor based on ACI, a technology more effective at Hg control than typical wet scrubbing applications. The three test conditions in the database indicate that ACI was effective in removing over 97 percent of Hg. However, the Hg feedrate during the single best ACI test condition was higher than the feedrate associated with the single best performing wet scrubber. In fact, Hg feedrates during the ACI test conditions ranged from 5 to 300 times greater than the wet scrubber MTEC level. To determine an emissions level that ACI could routinely achieve, we applied a capture efficiency of 90 percent to a Hg MTEC of 500 μg/dscm, a typical feedrate identified by a MTEC breakpoint analysis. Thus, using the revised database, the floor level for the ACI evaluation would be 50 μg/dscm which is slightly higher than the wet scrubber floor analysis. The floor for new sources based on the wet scrubber evaluation appears to be more appropriate because the floor level for new sources should be at least as stringent as for existing sources.

d. BTF considerations for new sources. At proposal, BTF for new sources was based on ACI. Similar to existing sources, the Agency re-considered the use of ACI as the BTF technology. We identified a level of 4 μg/dscm as a potential BTF standard for new sources based on ACI and flue gas temperature reduction to 400 °F or less. As discussed for existing sources, this BTF level based on ACI will likely raise significant cost-effectiveness considerations.

4. *Particulate Matter (PM).* a. MACT floor for existing sources. At proposal, EPA defined floor control based on either (1) a fabric filter with an air-to-

[27] USEPA, Section 5 of ''Draft Technical Support Document For HWC MACT Standards, Volume III: Selection of Proposed MACT Standards and Technologies,'' February 1996.

cloth ratio of 10 acfm/ft^2, or (2) a venturi scrubber used with an ionizing wet scrubber (IWS). The resulting floor level, which included a statistically-derived variability factor, was 0.107 gr/dscf. Since this level is higher than the current federal standard of 0.08 gr/dscf, the Agency identified the floor level as 0.08 gr/dscf.

Today, in light of the revised database, EPA is taking comment on two refined engineering and data analysis methods to identify the PM MACT floor for HWIs. The evaluation technique and results from both analyses are presented below.

For the first (and possibly EPA's preferred) data method, EPA would use the following steps to identify the PM floor level: (1) Identify all PM control equipment currently in use within the HWI source category, regardless of measured performance; (2) identify as MACT control those PM APCD applications used by at least 6 percent of sources that could be expected to routinely and consistently achieve superior PM performance relative to all control strategies considered; and (3) identify an emissions level that well-designed, operated and maintained MACT controls can readily achieve based on generally-accepted technical and engineering information.

Using this approach, MACT controls would be fabric filter, IWS, and ESP. Based on the revised database, EPA's evaluation of the MACT floor performance level readily achievable by a well designed, operated and maintained MACT control device (fabric filter, IWS, ESP) is 0.015 gr/dscf. Note that even though the PM MACT floor is based on fabric filter, IWS and ESP APCDs, a source is not required to employ MACT floor control but rather only achieve the standard.

Approximately 75 percent of sources employing MACT (measured by available test condition data) currently are achieving 0.015 gr/dscf. An evaluation of the remaining PM data exceeding 0.015 gr/dscf from sources ostensibly employing MACT indicate that 20 to 40 percent of these data may be inappropriate for inclusion (e.g., an incinerator with multiple test conditions well below and a few above 0.015 gr/dscf). Generally, over 50 percent of HWIs, regardless of the PM control currently employed, are currently achieving a 0.015 gr/dscf level.

The second refined data evaluation method EPA is considering for PM Floor analysis is similar to the standard-setting process applied at proposal. This evaluation is a four-step process: (1) Rank all PM emissions data and identify the MACT floor controls used by the best performing 6 percent of sources; (2) develop the expanded universe to include all sources employing MACT control, without further characterizing MACT control (e.g., air-to-cloth ratio of the fabric filter, specific collection area for an ESP) as done in the proposal because of the absence of reliable detailed design, operating, and maintenance information in the database; (3) for each PM test condition, evaluate the corresponding SVM system removal efficiency (SRE) and screen out sources that have relatively poor SREs (i.e., outliers above a breakpoint in the data array), which are indicators of poor design, operation, and maintenance characteristics of the MACT controls at the source; and (4) identify the MACT floor equal to the highest test condition average of all test conditions in the PM expanded universe.

Using this alternative evaluation approach as applied to the revised database, MACT would be based on any of the following PM controls: (1) Fabric filter, (2) IWS, (3) ESP, or (4) venturi scrubber burning liquid low ash wastes. The resultant MACT floor would be 0.029 gr/dscf. Over 70 percent of HWIs, regardless of the PM control equipment employed, are currently achieving this level. A potential drawback of using this second alternative evaluation technique is that nearly 75 percent of the available incinerator PM data do not have corresponding SVM data such that a SRE could be calculated. This impacts our ability to identify and screen out poorer performing MACT APCDs from the expanded universe, a critical step in evaluating an appropriate performance level achievable by MACT control. As a result, this evaluation technique may not be appropriately identifying a PM floor level representative of MACT. For these reasons, the first data method evaluation appears to be more reliable and sound for the Agency's revised database. The Agency requests comments on the both data analysis methods presented.

In the NPRM, the Agency proposed that sources maintain continuous compliance with the PM standard through the use of a PM CEMS. A decision whether to require incinerators to install a PM CEMS will be made at the completion of an on-going demonstration testing program to determine if at least one PM CEMS can meet the proposed performance specifications. Since the floor standards discussed above were based on manual test method data, the Agency will re-evaluate at the completion of the CEMS testing program whether these PM floor standards would be appropriate in the event that the final rulemaking requires continuous compliance with a PM CEMS. The Agency will notice the results and conclusions of the demonstration test program in the docket for the HWC rule.

b. BTF considerations for existing sources. In the NPRM, the Agency proposed a BTF level of 0.030 gr/dscf and solicited comment on an alternative BTF level of 0.015 gr/dscf based on improved PM control.

Based on the revised database, we can evaluate a reduced PM emissions level lower than 0.015 gr/dscf as the BTF standard (in conjunction with corresponding BTF reductions in SVMs and LVMs) for existing HWIs. This would require an improved PM collection technology such as the use of more expensive bag material for fabric filters or increased plate area or power input to an ESP. Given that the alternative floor level analyses presented today would be substantially lower than the proposed floor and BTF levels, significant cost-effectiveness considerations come into play and suggest that a BTF standard may not ultimately prove to be appropriate.

c. MACT floor for new sources. At proposal, the Agency defined floor control as a fabric filter with an air-to-cloth ratio of less than 3.8 acfm/ft^2. The proposed floor level was 0.039 gr/dscf.

Based upon our evaluation of the revised database, the floor control and emission level discussed above for existing sources would also appear to be appropriate for new sources. If this eventuates, then MACT floor control would be a well-designed and properly operated PM control device (e.g., fabric filter, IWS, or ESP), and the MACT floor for new HWIs would be around 0.015 gr/dscf.

d. BTF considerations for new sources. At proposal, EPA proposed the same BTF standard of 0.030 gr/dscf (based on improved PM control) as that proposed for existing sources.

Today, given the cost-effectiveness considerations discussed above for existing sources, the Agency is inclined to think that a BTF standard beyond a PM floor level of 0.015 gr/dscf (and corresponding BTF reductions for SVMs and LVMs) would not ultimately prove to be acceptable.

5. Semivolatile metals (SVM) (cadmium and lead) a. MACT floor for existing sources. At proposal, EPA defined floor control as either (1) a venturi scrubber with a MTEC not to exceed 170 µg/dscm, (2) a combination of an ESP and wet scrubber with a MTEC not to exceed 5,800 µg/dscm, or (3) a combination of venturi scrubber and IWS with a MTEC less than 49,000

µg/dscm. The proposed floor level was 270 µg/dscm.

HWIs use a combination of good PM control and limiting hazardous waste feedrates to control SVM emissions. SVMs, which typically vaporize at combustion chamber temperatures and recondense onto small-size particulates in the APCD, are controlled most efficiently by technologies that are effective at capturing fine PM. EPA's revised database shows that SVM emissions vary substantially from 2 to nearly 30,000 µg/dscm.

The refined data analysis method used by EPA to evaluate and identify a MACT floor would be based directly on the results from the PM floor analyses discussed above. As mentioned there, a floor of 0.015 gr/dscf would appear to represent the MACT floor for HWIs based on good PM control. Since SVMs are controlled, in part, by a well-designed and operated PM control devices, it follows that sources achieving this PM performance level at typical SVM feedrates should also be controlling SVMs emissions.

Therefore, in its refined SVM analyses of the revised database, the Agency first considers all SVM data when corresponding PM measurements are below 0.015 gr/dscf. To identify the SVM floor from these data, we would determine either the highest SVM test condition average or the level that excludes sources achieving substantially poorer SVM control than the majority of sources. It is most likely appropriate to use the latter approach—excluding sources with significantly poorer SVM performance—because their higher SVM emissions may be the result of exceedingly high SVM feedrates or some other factor that cannot be readily identified with available information (e.g., sampling or analysis anomalies). An SVM emissions breakpoint analysis is the approach for excluding these poorer performing test conditions.

Applying this evaluation technique to the revised HWI SVM database results in a MACT floor of 100 µg/dscm. Approximately 53 percent of all HWI SVM test condition data, regardless of PM emissions level, are currently achieving this emissions level.

As discussed above for PM, the Agency is soliciting comment on an alternative evaluation of the HWI PM data which identified a floor of 0.029 gr/dscf. Conducting the same SVM floor analysis discussed above when PM measurements were below 0.029 gr/dscf also results in the same floor of 240 µg/dscm. Approximately 60 percent of all HWI SVM test condition data, regardless of PM emissions level, are currently achieving this emissions level.

Finally, as discussed in an earlier section, a preliminary analysis indicates that MACT standards may not be warranted for one HAP metal, antimony. Since the number of metals being considered for MACT standards may change, we are investigating the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). Using the refined method discussed above for SVM, we analyzed the revised database with respect to Cd and Pb data. The floor analysis corresponding to PM measurements below 0.015 gr/dscf would result in the following floor levels: Cd 20 µg/dscm, and Pb 95 µg/dscm. The alternative data analysis method for individual metals when corresponding PM measurements were below 0.029 gr/dscf would result in the following floor levels: Cd 57 µg/dscm, and Pb 95 µg/dscm.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for SVMs based on improved PM control below 0.030 gr/dscf. However, the Agency concluded that a BTF standard would not be cost-effective given that the floor level alone would result in an estimated 94 percent SVM reduction in emissions.

As discussed for PM BTF considerations, we also re-evaluated the possible appropriateness of using a reduced PM emissions level based on improved PM control as a BTF standard (taking into consideration corresponding BTF reductions in SVMs) for existing HWIs. Given that the alternative PM floor level analyses presented today would be lower than the proposed floor and BTF floor levels, significant cost-effectiveness considerations emerge and suggest that a BTF standard for either SVMs or individual Pb or Cd standards based on improved PM control may not ultimately prove to be cost-effective.

If, however, the revised risk assessment yet to be conducted would show significant risk at a SVM floor standard of either 100 µg/dscm or 240 µg/dscm, which are floor levels from the two data analysis methods discussed above, the Agency will determine whether a BTF standard based on control of SVM feedrate to levels below those at the floor would be appropriate. This feedrate limitation would in turn reduce SVM emissions. The BTF standard and the corresponding level of feedrate control would be dictated by considerations of cost-effectiveness and the need to establish more stringent RCRA-related controls.

c. MACT floor for new sources. At proposal, the Agency defined floor control, based on the best performing source, as a combination of venturi scrubber and IWS with a MTEC less than 49,000 µg/dscm. The proposed floor level for new HWIs was 240 µg/dscm.

Based upon our re-evaluation of the database, the floor control and emission level discussed above for existing sources for PM and SVMs would also appear to be appropriate for new sources. In this event, MACT floor control would be a well-designed, operated and maintained PM control device (e.g., fabric filter, IWS, or ESP) achieving the PM floor level of 0.015 gr/dscf, and the MACT floor would be around 100 µg/dscm.

As discussed above, the Agency is soliciting comment on an alternative evaluation of the revised SVM database which concludes that MACT floor control is a well designed, operated and maintained PM control device (i.e., fabric filter, IWS, or ESP) achieving a PM level of 0.029 gr/dscf. The floor analysis considering all revised SVM data when corresponding PM measurements are below 0.029 gr/dscf results in a floor for new sources of 240 µg/dscm.

Finally, we have evaluated what individual metal floor levels for new sources would be. When PM measurements are below 0.015 gr/dscf, the analysis would result in floor levels for Cd of 20 µg/dscm and for Pb 95 µg/dscm. Under the alternative data analysis method for individual metals when PM measurements were below 0.029 gr/dscf, floor levels would be 57 µg/dscm for Cd and 95 µg/dscm for Pb.

d. BTF considerations for new sources. In the NPRM, the Agency proposed a BTF level of 62 µg/dscm based on improved PM control below 0.030 gr/dscf.

As discussed for PM, a reduced PM emissions level based on improved PM control could be considered in evaluating a potential BTF standard (considering corresponding BTF reductions in SVMs and LVMs) for new HWIs. Because the PM floor level presented today would be substantially lower than the proposed floor and proposed BTF floor level, cost-effectiveness issues are again raised and suggest that a BTF standard for either SVMs or individual Pb or Cd standards based on improved PM control may likewise ultimately prove to be inappropriate.

6. Low volatile metals (LVM) (arsenic, beryllium, and chromium). a. MACT Floor for Existing Sources. At proposal, EPA defined floor control as either (1) a venturi scrubber with a MTEC not to exceed 1,000 µg/dscm, or (2) an IWS with a MTEC less than 6,200 µg/dscm.

The proposed floor level was 210 µg/dscm, which included antimony.

HWIs use a combination of good PM control and limiting hazardous waste feedrates to control LVM emissions. LVMs are less likely to vaporize at combustion temperatures and therefore partition primarily to the residue or adsorb onto particles in the combustion gas. EPA's database shows that LVM emissions from HWIs vary widely from 1 to over 130,000 µg/dscm.

To identify a LVM MACT floor, the Agency used the same data analysis method applied to the revised SVM database. As was determined in the PM analysis of the revised database, a floor of 0.015 gr/dscf represents MACT for HWIs based on good PM control. Considering all LVM data from sources achieving a PM level 0.015 gr/dscf or better, the Agency's evaluation of the revised HWI data results in a LVM floor of 55 µg/dscm (excluding sources above a breakpoint and therefore achieving substantially poorer LVM emissions than the majority of sources). Over 70 percent of HWI LVM test condition data are currently achieving this emissions level.

As discussed earlier, the Agency is soliciting comment on an alternative evaluation of the revised HWI PM data which identified a floor of 0.029 gr/dscf. Evaluating the revised LVM data using this method results in a LVM floor of 190 µg/dscm. Approximately 90 percent of HWI LVM test condition data are currently achieving this level.

Finally, as discussed in an earlier section, a preliminary analysis indicates that MACT standards may not be warranted for one HAP, antimony. Since the number of metals being considered for MACT standards may change, we are investigating the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). Using the refined method discussed above for LVM, we analyzed the revised database with respect to As, Be, and Cr (hexavalent). The floor analysis corresponding to PM measurements below 0.015 gr/dscf results in the following floor levels: As 21 µg/dscm, Be 2 µg/dscm, and Cr (hexavalent) 3 µg/dscm. The alternative data analysis method for individual metals when corresponding PM measurements were below 0.029 gr/dscf results in the following Floor levels: As 21 µg/dscm, Be 2 µg/dscm, and Cr (hexavalent) 5.5 µg/dscm.

The Agency is concerned that some of the potential floor standards for some individual metals (e.g., Be, Cr (hexavalent)) may be present at levels approaching practical quantitation limits (PQLs). PQLs are the lowest level of quantification that the Agency believes a competent analytical laboratory can be expected to reliably achieve. The Agency will investigate whether this issue may need to be addressed in the development of any individual metals standards that may be considered for the final rulemaking. We invite comment on the issue of PQLs and LVM BTF standards.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for LVMs based on improved PM control below 0.030 gr/dscf. However, the Agency concluded that a BTF standard would not be cost-effective given that the floor level alone would result in an estimated 91 percent LVM reduction in emissions.

As discussed for PM, a reduced PM emissions level based on improved PM control could be considered in evaluating a potential BTF standard (taking into consideration corresponding BTF reductions in LVMs and SVMs) for existing HWIs. Because the PM floor level presented today would be substantially lower than the proposed floor and BTF floor levels, a BTF standard for either LVMs or individual As, Be, and Cr (hexavalent) standards based on improved PM control would raise significant cost-effectiveness concerns and may not be appropriate.

If, however, the revised risk assessment yet to be conducted would show significant risk at a LVM floor standard of either 55 µg/dscm or 190 µg/dscm, which are floor levels from the two data analysis methods discussed above, the Agency will determine whether a BTF standard based on control of LVM feedrate to levels below those at the floor would be appropriate. This feedrate limitation would in turn reduce LVM emissions. The BTF standard and the corresponding level of feedrate control would be dictated by considerations of cost-effectiveness and the need to establish more stringent RCRA-related controls.

c. MACT floor for new sources. At proposal, the Agency defined floor control, based on the best performing source, as a venturi scrubber with a MTEC less than 1,000 µg/dscm. The proposed floor level for new HWIs was 260 µg/dscm.

Based upon our re-evaluation of the database, the floor control and emission level discussed above for existing sources for PM and LVMs would also appear to be appropriate for new sources. MACT floor control is a well-designed, operated and maintained PM control device (e.g., fabric filter, IWS, or ESP) achieving the PM floor level of 0.015 gr/dscf, and analysis of the revised data results in a LVM MACT floor of 55 µg/dscm.

As discussed above, the Agency is soliciting comment on an alternative evaluation of the revised LVM database which identifies MACT floor control as a well-designed, operated and maintained PM control device (e.g., fabric filter, IWS, or ESP) achieving a PM level of 0.029 gr/dscf. The floor analysis considering all revised LVM data when corresponding PM measurements are below 0.029 gr/dscf results in a floor for new sources of 190 µg/dscm.

Finally, individual metal floor levels for new sources, when PM measurements are below 0.015 gr/dscf, are: As 21 µg/dscm, Be 2 µg/dscm, and Cr (hexavalent) 3 µg/dscm. Under the alternative data analysis method for individual metals when PM measurements are below 0.029 gr/dscf, the floor levels are: As 21 µg/dscm, Be 2 µg/dscm, and Cr (hexavalent) 5.5 µg/dscm. [Note: The same PQL concerns would be present here as well.]

d. BTF considerations for new sources. In the NPRM, the Agency proposed a BTF level of 60 µg/dscm based on improved PM control below 0.030 gr/dscf.

As discussed for PM BTF considerations, the Agency considered a reduced PM emissions level based on improved PM control as the BTF standard (taking into consideration corresponding BTF reductions in LVMs and SVMs) for new (and existing) HWIs. Because the alternative PM floor level presented today is substantially lower than the proposed floor and BTF floor levels, a BTF standard for either LVMs or individual As, Be, or Cr (hexavalent) standards based on improved PM control may be inappropriate in light of the cost-effectiveness issues inherent in this scenario.

7. *Hydrochloric Acid and Chlorine (HCl/Cl2).* a. MACT Floor for Existing Sources. At proposal, the Agency defined floor control as wet scrubbing with a chlorine MTEC (i.e., maximum theoretical emission concentration) up to 2.1E7 ''µg/dscm and proposed a floor standard of 280 ppmv. While evaluating the revised database, we investigated another data analysis method whereby floor control would be defined as wet scrubbing combined with chlorine feedrate control to achieve an emission level of 75 ppmv.[28] Under this method,

[28] Although a specific feedrate (i.e., MTEC) level is not used to define MACT floor, feedrate control is part of floor control to achieve the 75 ppmv standard using wet scrubbing (i.e., a source would probably not be able to feed chlorine at extremely high rates and still achieve the standard using wet scrubbing). Further, as discussed below in the text,

emissions data from sources using wet or dry scrubbing were arrayed from lowest to highest (without explicit regard to chlorine feedrate) and sources achieving substantially poorer HCl/Cl2 control than other sources were screened from the analysis. Accordingly, after five of 48 test conditions were screened from the analysis for anomalously high emission rates,[29] the floor standard was established as the highest remaining test condition average—75 ppmv.[30] Nearly 90 percent of test conditions [31] in the revised database have emission levels below 75 ppmv.

The Agency requests comment on whether this alternative approach to define floor control and a floor level would be more appropriate than the proposed approach.

b. BTF considerations for existing sources. At proposal, the Agency determined that a BTF standard would not be warranted. Specifically, the Agency noted that risk from emissions at the floor standard would not likely trigger the need for additional control under RCRA.

Although that may prove to be the case as well for the alternative standard discussed in today's notice (i.e., 75 ppmv), the risk assessment accompanying the final rule will consider incinerators with short stacks and will also consider acute risk from HCl and Cl2 during short-term exposures. The risk assessment at proposal modeled emissions only from incinerators with relatively tall stacks, and did not consider acute exposure to HCl and Cl2. If, however, the revised risk assessment yet to be conducted shows significant risk at a floor standard of 75 ppmv, the Agency will determine whether a BTF standard would be appropriate considering cost-effectiveness of such a standard and the need to establish more stringent controls under RCRA. In that case, BTF control could be based on a minimum system removal efficiency (e.g., 99.9 percent) and/or control of chlorine feedrate.

c. MACT floor for new sources. At proposal, the Agency identified floor control for new incinerators as wet scrubbing with an MTEC of 1.7E7 μg/dcsm See 61 FR at 17388. Although the floor control for new sources was based on the single best performing source and was more stringent than floor control for existing sources, the floor emission level was the same for new and existing sources: 280 ppmv.

When evaluating the revised emissions database considering various data analyses methods for today's notice, we determined that floor control for new sources should be the same as for existing sources: Wet scrubbing with chlorine feedrate control to achieve an emission level of 75 ppmv. This is state-of-the-art control for these HAPs. Accordingly, the floor standard for new sources would be 75 ppmv under this data analysis method.

d. BTF considerations for new sources. The Agency proposed BTF control for new incinerators as 99 percent SRE and a BTF standard of 67 ppmv. This standard was based on applying 99 percent reduction to the test condition in the database with the highest average emission without an emission control device (i.e., 1100 ppmv). Then, considering other factors including a computed emissions variability factor, the Agency determined that a BTF standard of 67 ppmv would be appropriate.

In retrospect, as we discussed above, virtually all sources are already equipped with some form of scrubber and 90 percent are achieving emission levels of 75 ppmv or below. Thus, this would be an appropriate floor control and standard for new sources. As discussed above for existing sources, a BTF standard appears to be unnecessary, unless the upcoming final risk analysis indicates that more stringent controls under RCRA would be warranted. A BTF standard could be based on a minimum system removal efficiency (e.g., 99.9 percent) and/or control of chlorine feedrate.

8. *Carbon Monoxide (CO).* As proposed, the Agency continues to believe that floor control for CO (as a surrogate for organic HAPs) for both existing and new sources would be operation under good combustion practices. The preponderance of the revised emissions data indicate that a floor standard of 100 ppmv over an hourly rolling average (HRA) would be readily achievable. In addition, the Agency continues to believe that a BTF standard for CO based on better good combustion practices is likely to raise significant cost-effectiveness considerations.

9. *Hydrocarbons (HC).* The Agency proposed that floor control for HC (as a surrogate for otherwise unaddressed organic HAPs) for both existing and new sources would be operated under good combustion practices and that a floor standard of 12 ppmv over an hourly rolling average (HRA), would be appropriate. In evaluating the revised emission database for today's notice, we used the same general approach for HC as at proposal—the entire database was arrayed from the lowest to the highest emission levels and assumed that test conditions beyond a breakpoint were not operated under good combustion practices. Based on that analysis, a floor level for HC of 10 ppmv, HRA, results. (This 10 ppmv standard does not include a variability factor for reasons discussed above, unlike the proposed standard of 12 ppmv that did.) Not only does the revised database show that the preponderance of the data are below 10 ppmv, but engineering experience and other engineering information suggests that a HC level of 10 ppmv is readily achievable using good combustion practices.

As discussed at proposal, the Agency continues to be concerned about cost-effectiveness considerations related to BTF controls for HC based on operating under better combustion practices.

F. Re-Evaluation of Proposed MACT Standards for Cement Kilns

We discuss in this section the basis for the revised standards for cement kilns that result from applying engineering and data analysis to the revised emissions database.[32] A comparison of the proposed and potentially revised standards for existing and new sources is presented in the table below:

sources with anomalously high emissions were screened from consideration. One reason that a source may have anomalously high emissions is that it may be feeding unusually high levels of chlorine.

[29] The anomalously high emissions could have been caused by: (1) Poor design, operation, or maintenance of the scrubber, and thus the device would not represent MACT (e.g., a dry scrubber was screened from the analysis because dry scrubbers are generally less efficient than wet scrubbers); (2) unusually high chlorine feedrates; or (3) sampling or analysis anomalies.

[30] The floor standard under this alternative analysis method—75 ppmv—would be substantially lower than the proposed floor standard—280 ppmv—even though feedrate control of chlorine would not be used explicitly to help define floor control under this alternative method because, to identify the proposed standard, the Agency: (1) Selected as the standard-setting test condition the highest test condition for sources appearing to be using floor control without screening anomalous test conditions; and (2) added a computed emissions variability factor to emissions from that standard-setting test condition.

[31] Considering approximately 50 test conditions where emissions levels on both HCl and Cl2 were available.

[32] Additional details of the engineering and data analysis evaluations performed on the revised emissions database can be found in the Agency's background document: USEPA, ''Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database'', April 1997.

TABLE II.F.—REVISED STANDARDS FOR EXISTING AND NEW CEMENT KILNS

HAP or HAP Surrogate	Existing sources		New sources	
	Proposed standard	Revised standard	Proposed standard	Revised standard
D/F (ng TEQ/dscm)	[1] 0.20	0.20	0.20	0.20
Hg (µg/dscm)	50	72	50	72
PM (gr/dscf)	0.030	0.030	0.030	0.030
HCl/Cl2 (ppmv)	630	120	67	120
CO (ppmv)	100	100	100	100
HC (ppmv):				
Main Stack [2]	20	20	20	20
By-Pass	6.7	10	6.7	10
SVM (µg/dscm)	57	670	55	670
LVM (µg/dscm)	130	63	44	63

[1] All emission levels are corrected to 7% O_2.
[2] Not applicable to preheater and/or precalciner kilns.

1. *Subcategorization considerations.* After analyzing comments submitted by the Cement Kiln Recycling Coalition (CKRC) on the proposed rule, including information on the types of cement kilns that are currently burning hazardous waste, we considered whether the following subcategories would be appropriate: (1) Short kilns with separate by-pass and main stacks; (2) short kilns with a single stack that handles both by-pass and preheater or precalciner emissions; (3) long dry kilns that use kiln gas to dry raw meal in the raw mill; and (4) others (i.e., wet kilns, and long dry kilns not using raw mill drying). Each of the first three categories is comprised of only one cement kiln facility while the kilns at the remaining 19 facilities are in the fourth category: wet kilns or long dry kilns that do not use raw mill drying. We find that these subcategories should be considered because the unique design or operating features of these kilns could have a significant impact on emissions of one or more HAPs that the Agency proposed to regulate.

To determine whether special standards would be appropriate for any of the three unique cement kiln types, we identified floor control and emission levels considering data only for the other kilns (i.e., wet kilns, and long dry kilns not using raw mill drying). We then considered whether the unique kiln types could apply the those MACT controls and achieve those emission standards. It appears that these unique kilns can employ the MACT controls and achieve the corresponding emission levels identified in today's notice for the other kilns (i.e., wet kilns, and long dry kilns not using raw mill drying). Thus, subcategorization would not appear to be needed to determine achievable MACT floors for all cement kilns burning hazardous waste.

2. *Dioxins and Furans (D/F).* a. MACT Floor for Existing Sources. At proposal, the Agency identified floor control as ''temperature control at the inlet to the ESP or fabric filter at 418 °F''. The proposed floor emission level was ''0.20 ng TEQ/dscm, or temperature at the inlet to the ESP or fabric filter not to exceed 418 °F''.

Upon re-evaluation of the revised database, we have identified an alternative data analysis method that seems more appropriate to identify floor control and the floor emission level. Based on an engineering evaluation of these data and other available information, floor control would be ''temperature control at the inlet to the ESP or fabric filter at 400 °F''. This results in a floor emission level of ''0.20 ng TEQ/dscm, or 0.40 ng TEQ/dscm and temperature at the inlet to the ESP or fabric filter not to exceed 400 °F''.[33]

Temperature control to 400 °F or lower is appropriate for floor control because, from an engineering perspective, it is within the range of reasonable values that could have been selected considering that: (1) The optimum temperature window for surface-catalyzed D/F formation is 450–750 °F; and (2) below 350 °F, kiln gas can fall below the dew point which can increase corrosion in ESPs and fabric filters and reduce performance of the control devices. In addition, approximately 20 percent of the test conditions in our revised database reflect operations at temperatures of 400 °F or below. Thus, this temperature level is readily achievable.

To identify an emission level that temperature control ≤400 °F could achieve, it is appropriate to pool the available emissions data for hazardous waste burning kilns with data from nonwaste burning kilns.[34] This is because we are not aware of an engineering reason why hazardous waste burning would affect emissions of D/F. In fact, when the data sets are evaluated separately, the highest emitting HW cement kiln operating the ESP or fabric filter at temperatures ≤400 °F had D/F emissions of 0.28 ng TEQ/dscm. The highest emitting nonwaste cement kiln operating at those temperatures had D/F emissions of 0.37 ng TEQ/dscm. We believe that the difference in emission levels is simply a reflection of many design, operation, and maintenance factors on which we have little or no information, but which could affect D/F emission levels. An appropriate emission level associated with that operating temperature for all cement kilns would be 0.40 ng TEQ/dscm. Thus, the floor standard would be: ''0.20 ng TEQ/dscm, or 0.40 ng TEQ/dscm and temperature at the inlet to the ESP or fabric filter not to exceed 400 °F''.

b. BTF considerations for existing sources. The Agency proposed a BTF standard of 0.20 ng TEQ/dscm based on ACI operated at a temperature of ≤400

[33] The standard would be expressed in the form of a TEQ level combined with a maximum temperature at the PM control device. This form of the standard is consistent with the revised data and would result in somewhat lower emissions (i.e., because without the TEQ limit, some sources could exceed that TEQ level at the specified temperature). Thus, expressing the standard in this form better achieves the statutory mandate to establish standards that provide the maximum degree of reduction that is achievable in practice.

[34] We considered whether nonwaste cement kiln emission data should be pooled with HW cement kiln data for other HAPs and determined that emissions of other HAPs, except for PM, could be affected by hazardous waste burning. For example, hazardous waste can have higher levels of chlorine and metals such as Pb. With respect to PM, although it appears appropriate to pool the data sets, the better-suited data analysis method is based on the New Source Performance Standard, not an analysis of the emissions database. Thus, pooling of data would not affect the standard derived from that data analysis method. See discussion on the PM standard in the text.

°F. We continue to believe that this BTF standard is appropriate given the concerns the Agency has expressed about the risks posed by D/F emissions, and the Hg reductions that ACI would also provide. See 61 FR at 17392. Only sources emitting between 0.20 and 0.40 ng TEQ/dscm with temperature control alone would need to take further measures to reduce D/F levels to 0.20 ng under the BTF standard. Although these sources could achieve D/F emission levels well below 0.20 ng TEQ/dscm using ACI (i.e., ACI removal efficiency should be in the 95–99 percent range), a 0.20 ng TEQ/dscm appears still to be appropriate because it may allow some sources to meet the standard more cost-effectively by lowering gas temperatures at the ESP or fabric filter below 400 °F. Further, a BTF standard of 0.20 ng TEQ/dscm would likely avoid the need to provide further controls under RCRA authority.

c. MACT floor for new sources. At proposal, the Agency identified floor control for new sources as ''temperature control at the inlet to the ESP or fabric filter at 409 °F''. The proposed floor emission level was ''0.20 ng TEQ/dscm, or temperature at the inlet to the ESP or fabric filter not to exceed 409 °F''.

Upon evaluation of the revised database, the floor control and emission level discussed above for existing sources would also be appropriate for new sources (i.e., ''temperature control at the inlet to the ESP or fabric filter at 400 °F'' corresponding to an emission level of ''0.20 ng TEQ/dscm, or 0.40 ng TEQ/dscm and temperature at the inlet to the ESP or fabric filter not to exceed 400 °F''. This is because our engineering evaluation of available information and facility operating experience indicates that the best controlled source is one that is controlling temperature control at the inlet to the fabric filter at 400 °F.

d. BTF considerations for new sources. The Agency proposed ACI as BTF control and a BTF standard of 0.20 ng TEQ/dscm. We continue to believe that this BTF standard is appropriate for new sources for the same reasons discussed above in the context of existing sources.

3. *Mercury (Hg).* a. MACT floor for existing sources. At proposal, the Agency identified floor control as hazardous waste feedrate control not to exceed an MTEC of 110 µg/dscm. EPA proposed a floor standard of 130 µg/dscm.

All cement kilns employ either ESPs and fabric filters for PM control. However, since Hg is generally in the vapor form in and downstream of the combustion chamber, including the air pollution control device, ESPs and fabric filters do not achieve good mercury control. Mercury emissions from cement kilns are currently controlled by the BIF rule which establishes limits on the maximum feedrate of Hg in total feedstreams (e.g., hazardous waste, raw materials, coal). Thus, MACT is based on hazardous waste feed control.

Review of the revised database indicate that cement kilns only infrequently conducted Hg spiking of the hazardous wastes (contrary to the Agency's initial information), and thus the Hg content in the wastes during testing is likely representative of the Hg content during typical operations. The revised data also show that raw materials can represent a significant source Hg input to the kiln system. Since cement kilns do not employ a dedicated device capable of Hg control, the Agency believes that the Hg data are essentially ''normal'' even though generated during worst case compliance testing conditions for other parameters.

To evaluate these revised data for the purpose of determining a MACT floor, the Agency used the following data analysis steps: (1) Rank Hg emissions from lowest to highest; (2) conduct a breakpoint analysis on the ranked Hg emissions data, and (3) establish the floor standard as the test condition average of the breakpoint source. The breakpoint analysis reflects an engineering-based evaluation of the data and ensures that the few cement kilns spiking extra Hg do not drive the floor level to levels higher than the preponderance of this ''normal'' data indicates is routinely achievable. The Agency's analysis results in a MACT floor level of 72 µg/dscm. The revised database indicates that approximately 80 percent of cement kilns are achieving this floor level.

b. BTF considerations for existing sources. The Agency proposed a BTF standard of 50 µg/dscm based on flue gas temperature reduction to 400 °F or less followed by ACI. EPA continues to believe that ACI is an appropriate BTF technology for cement kilns. Although ACI is not employed for Hg control at any full-scale HW cement kiln, the Agency is not aware of any cement kiln flue gas conditions that would preclude the applicability of ACI—which has been demonstrated for other similar types of combustion applications. As discussed in the NPRM, EPA assumes that cement kilns employing ACI to meet a BTF standard would install the ACI system after the existing ESP or fabric filter, and then add on a new fabric filter to remove the injected carbon with the adsorbed Hg. Although adding a new fabric filter in series is an expensive approach, it will enable cement kilns to continue current cement kiln dust (CKD) recycling practices by avoiding potential internal build-up of Hg from CKD recycling.

In the NPRM, the cement kiln BTF standard was based on the assumption that an ACI system could routinely achieve Hg emissions reductions of 80 to 90 percent. The Agency received public comments from, among others, the cement manufacturing industry questioning whether a ACI application on a cement kiln could routinely achieve capture efficiencies as proposed. The commenters went on to say that removal efficiencies of approximately 60 percent were perhaps more realistic. We will address these comments specifically as part in the final rulemaking, but for the purposes of today's analysis, EPA has assumed an ACI effectiveness of 60 percent in identifying BTF levels for cement kilns. Thus, the BTF standard for cement kilns would be 30 µg/dscm based on an ACI efficiency of 60 percent applied to the potential floor level of 72 µg/dscm.

Ultimately adopting a BTF standard of 30 µg/dscm for cement kilns will likely involve close scrutiny of cost-effectiveness and other factors, including the costs of retrofits that sources will need to undertake (e.g., installing the ACI system, add-on of a new fabric filter, managing the captured carbon) relative to the emissions reductions achieved. Without pre-judging this issue, the Agency's experience to date suggests that the final analysis may well reveal significant drawbacks associated with the BTF level.

c. MACT floor for new sources. At proposal, the Agency identified floor control for new sources as hazardous waste feedrate control not to exceed an MTEC of 28 µg/dscm. EPA proposed a floor standard of 82 µg/dscm.

The Agency believes that the floor control and emission level discussed above for existing sources would also be appropriate for new sources. Thus, the MACT floor for new cement kilns would be 72 µg/dscm based on the revised database.

d. BTF considerations for new sources. At proposal, BTF for new sources was based on ACI and we proposed a BTF standard of 50 µg/dscm.

As discussed for existing sources, the Agency is considering the use of ACI and flue gas temperature reduction to 400 °F as the BTF technology. In evaluating the revised database, EPA has identified a level of 30 µg/dscm as the BTF standard for new sources based on ACI. This is based on a source achieving the MACT new floor level of

72 μg/dscm and then applying ACI with a 60 percent removal efficiency. For the same reasons identified for existing sources, the Agency is concerned about whether this BTF level based on ACI will ultimately prove to be cost-effective for new cement kiln sources.

4. *Particulate Matter (PM).* a. MACT floor for existing sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio of 2.3 acfm/ft^2. The floor analysis led to a level of 0.065 gr/dscf, but due to concerns with the appropriateness of using a statistically-derived variability factor, the Agency instead established the floor standard based on the cement kiln New Source Performance Standard (NSPS). The NSPS is a process emissions rate that converts to an approximate flue gas concentration of 0.03 gr/dscf.

Today, EPA is taking comment on two data analysis methods to identify the PM floor standard for cement kilns. The first data analysis method would be to establish the floor standard equivalent to the NSPS, which is 0.3 lbs PM per ton of dry raw material feed. Currently, approximately 20 percent of HW cement kilns are subject to the NSPS. Cement kilns achieve the NSPS with well-designed and properly operated ESPs or fabric filters.

A second data analysis method considered and potentially preferred would be to express the NSPS as a stack gas concentration limit as done in the NPRM. The conversion of the NSPS to a concentration standard will vary by kiln process type (e.g., wet, dry, preheater, preheater/precalciner) because the amount of flue gas generated per ton of raw material feed varies by process type. Based on typical factors of flue gas quantities generated per ton of raw material feed and flue gas moisture content, the NSPS equates to a PM concentration of approximately 0.03 gr/dscf for wet process kilns (also the least energy efficient) and 0.05 gr/dscf for preheater kilns (the most energy efficient). The total HW cement kiln universe is comprised of 41 kilns with varying process types: 27 wet, 12 long dry, one preheater/precalciner, and one preheater. Of the cement kilns currently subject to the NSPS standard, four are wet, two are long dry, one preheater/precalciner, and one preheater.

Notwithstanding that the concentration equivalent of the NSPS can vary by process type, establishing the floor standard for all cement kilns at 0.030 gr/dscf appears to be appropriate regardless of manufacturing process utilized, for the following reasons: (1) The majority (66 percent) of the cement kilns are wet process kilns for which the NSPS concentration equivalent is 0.030 gr/dscf. For these kilns, this floor method would not differ from the initial NSPS method used in the proposal. (2) Our database shows non-wet process kilns have at least one test condition (in addition to three quarters of all non-wet process kiln data) achieving 0.030 gr/dscf. Therefore, achievability of the floor appears to be satisfied. (3) Even though wet process kilns typically have lower inlet grain loadings than the non-wet processes, non-wet kilns are achieving the 0.030 gr/dscf level. Again, the achievability requirement is met. Thus, the Agency believes that it is appropriate to establish the MACT floor for existing sources at 0.030 gr/dscf.

In the NPRM, the Agency proposed that sources maintain continuous compliance with the PM standard through the use of a PM CEMS. A decision whether to require cement kilns to install a PM CEMS will be made at the completion of an on-going demonstration testing program to determine if at least one PM CEMS can meet the proposed performance specifications. Since the floor standards discussed above were based on manual test method data, the Agency will re-evaluate at the completion of the CEMS testing program whether these PM floor standards would be appropriate in the event that the final rulemaking requires continuous compliance with a PM CEMS. The Agency will make available the results and conclusions of the demonstration test program in the docket for the HWC rule.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF level of 0.015 gr/dscf based on improved PM control. However, we determined that such a standard would not likely be cost-effective. We did not have adequate data to ensure that, given the high inlet grain loading caused by entrained raw material, cement kilns could routinely achieve 0.015 gr/dscf and below with a single fabric filter or ESP.

In light of the revised database, the Agency again considered a BTF PM emissions level based on improved PM control. Because the floor level of 0.030 gr/dscf presented today is the same as the proposed floor, a BTF standard lower than 0.030 gr/dscf (even with corresponding BTF reductions for SVMs and LVMs) appears not to be cost-effective based on information developed at proposal.

c. MACT floor for new sources. At proposal, the Agency defined floor control as a fabric filter with an air-to-cloth ratio of less than 1.8 acfm/ft^2. The floor analysis lead to a level of 0.065 gr/dscf. Due to concerns with the appropriateness of the statistically-derived variability factor, the Agency instead established the floor standard based on the cement kiln NSPS. The NSPS is a process emissions rate that the Agency converted to an approximate flue gas concentration of 0.030 gr/dscf.

Upon evaluation of the revised database discussed for existing sources, EPA continues to believe that the floor standard discussed above for existing sources would also be appropriate for new sources. Therefore, MACT floor control is a well-designed and properly operated PM control device (e.g., fabric filter, ESP), and the MACT floor for new cement kilns would be 0.030 gr/dscf.

d. BTF considerations for new sources. In the NPRM, EPA considered a BTF standard based on improved PM control to be consistent with existing sources. However, we found that the BTF level would not be cost-effective.

Today, as discussed above for existing source BTF considerations and based upon examining the revised database in light of the findings at proposal, a BTF standard beyond a PM level of 0.030 gr/dscf (and corresponding BTF reductions for SVMs and LVMs) would not appear to be cost-effective.

5. *Semivolatile Metals (SVM) (cadmium and lead).* a. MACT Floor for Existing Sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio less than 2.1 acfm/ft^2 and a HW MTEC of 84,000 μg/dscm. The proposed floor level was 57 μg/dscm.

Cement kilns use a combination of good PM control and limiting hazardous waste feedrates to control SVM emissions. SVMs are controlled most efficiently by technologies, such as fabric filters, which are effective at capturing fine PM. EPA's database shows that SVM emissions vary substantially from 1 to over 6,000 μg/dscm.

The engineering evaluation and data analysis method used by EPA to evaluate and identify a MACT floor from the revised database is an extension of the PM floor analyses of the revised database. As discussed in the PM analysis, a floor of 0.030 gr/dscf could represent MACT based on good PM control. Since SVMs are controlled, in part, by a well-designed and operated PM control device, it follows that sources achieving this PM performance level should also be controlling SVM emissions at typical SVM feedrates. Therefore, in its refined SVM analysis of the revised database, EPA would first consider all SVM data when corresponding PM measurements are below 0.030 gr/dscf. To identify the SVM floor from these data, we would identify the floor at the level that excludes (by breakpoint analysis) sources achieving substantially poorer SVM control than the majority of sources. As noted earlier in the case of HWIs, it is appropriate to exclude sources with significantly poorer SVM performance because their higher SVM emissions may be the result of exceedingly high SVM feedrates or some other factor that shows the test condition did not actually reflect MACT floor controls. The Agency does not have available information to otherwise screen out these non-MACT test conditions from the expanded universe for SVM.

The Agency's evaluation of the revised cement kiln SVMs data results in a MACT floor of approximately 670 μg/dscm. Approximately 85 percent of SVM test condition data are currently achieving this emissions level.

Finally, as discussed in an earlier section, a preliminary analysis indicates that MACT standards may not be warranted for one HAP metal, antimony. Since the number of metals being considered for MACT standards may change, we are investigating the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). Using the refined method discussed above for SVM, we analyzed the revised database with respect to Cd and Pb data. The floor analysis corresponding to PM measurements below 0.030 gr/dscf would result in the following floor levels: Cd 60 μg/dscm, and Pb 560 μg/dscm.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for SVMs based on improved PM control below 0.030 gr/dscf. However, the Agency concluded that a BTF standard would not be cost-effective given that the SVM Floor level of 57 μg/dscm alone would result in an estimated 94 percent SVM reduction in emissions.

As discussed for PM BTF considerations, the Agency also re-evaluated the possible appropriateness of using a reduced PM emissions level based on improved PM control as a BTF standard (with corresponding BTF reductions in SVMs and LVMs). Even though the SVM floor standard is higher than at proposal, our preliminary judgment is that significant cost-effectiveness considerations will likely be encountered in a final analysis of whether to establish a BTF standard for either SVMs or for Pb or Cd individually.

If, however, the revised risk assessment yet to be conducted would show significant risk at a SVM floor standard of either 670 μg/dscm, the Agency will determine whether a BTF standard based on control of HW SVM feedrate to levels below those at the floor would be appropriate. This feedrate limitation would in turn reduce SVM emissions. The BTF standard and the corresponding level of feedrate control would be dictated by considerations of cost-effectiveness and the need to establish more stringent RCRA-related controls.

c. MACT floor for new sources. At proposal, the Agency defined floor control, based on the best performing source, as a fabric filter with an air-to-cloth ratio less than 2.1 acfm/ft^2 and a HW MTEC of 36,000 μg/dscm The proposed floor level for new cement kilns was 55 μg/dscm.

Upon evaluation of the revised database, EPA believes that the floor control and emission level discussed above for existing sources for SVMs would also be appropriate for new sources. In this event, MACT floor control would be a well-designed, operated and maintained PM control device (i.e., fabric filter or ESP) achieving the PM floor level of 0.030 gr/dscf. The Agency's evaluation of the revised SVM data results in a MACT floor of 670 μg/dscm.

Finally, based on the revised database, individual metal floor levels for new sources are identical to those for existing sources. Thus, individual Cd and Pb standards are: Cd 65 μg/dscm and Pb 550 μg/dscm.

d. BTF Considerations for new sources. In the NPRM, the Agency considered a SVM BTF level, but determined that a BTF standard would not be cost-effective.

As discussed for existing sources, the Agency considered a more stringent PM emissions level for improved control of PM, SVM and LVM emissions for new cement kilns in light of the revised database. Even though the SVM floor standard is higher than at proposal, our preliminary judgment is that significant cost-effectiveness considerations will likely be encountered in a final analysis of whether to establish a BTF standard for either SVMs or for Pb or Cd individually.

6. *Low Volatile Metals (LVM) (arsenic, beryllium, and chromium).* a. MACT floor for existing sources. At proposal, EPA defined floor control as either (1) a fabric filter with an air-to-cloth ratio less than 2.3 acfm/ft^2 and a HW MTEC of 140,000 μg/dscm, or (2) an ESP with a specific collection area of 350 ft^2/kacfm. The proposed floor level was 130 μg/dscm, which included antimony.

The engineering and data analysis method used by EPA to evaluate the revised database and identify a MACT floor for LVMs is also related directly to the PM floor analysis. As was determined in the PM analysis, a floor of 0.030 gr/dscf represents MACT for cement kilns based on good PM control. Considering all LVM data from sources achieving a PM level 0.030 gr/dscf or better, EPA's evaluation of the revised cement kiln data would result in a LVM floor of 63 μg/dscm (excluding sources above a breakpoint and therefore excluding those with substantially poorer LVM emissions than the majority of sources). Approximately 90 percent of cement kiln LVM test condition data are currently achieving this emissions level.

Finally, as discussed for SVMs, EPA is continuing to investigate the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). The Agency analyzed individual As, Be, and Cr (hexavalent) data and established individual metal floor levels consistent with the engineering evaluation and data analysis method. Where PM measurements are below 0.030 gr/dscf, the result would be: As 10 μg/dscm, Be 1.1μg/dscm, and Cr (hexavalent) 4.6 μg/dscm.

The Agency is concerned that some of the potential floor standards for some individual metals (e.g., Be, Cr (hexavalent)) may be present at levels approaching practical quantitation limits (PQLs). PQLs are the lowest level of quantification that the Agency believes a competent analytical laboratory can be expected to reliably achieve. The Agency will investigate whether this issue may need to be addressed in the development of any individual metals standards that may be considered for the final rulemaking. We invite comment on the issue of PQLs and LVM BTF standards.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for LVMs based on improved PM control below 0.030 gr/dscf. However, the Agency concluded that a BTF LVM standard would not be cost-effective.

As discussed for PM, a reduced PM emissions level based on improved PM control could be considered in evaluating a potential BTF standard (taking into consideration corresponding BTF reductions in LVMs and SVMs) for existing CKs. Because both the PM and LVM floor levels presented today would be similar to the proposed floor, a BTF standard for either LVMs or individual As, Be, and Cr (hexavalent) standards based on improved PM control would likely raise significant cost-effectiveness concerns and may not ultimately be appropriate.

c. MACT floor for new sources. At proposal, the Agency defined floor control, based on the best performing source, as a fabric filter with an air-to-cloth ratio less than 2.3 acfm/ft^2 and a HW MTEC of 25,000 μg/dscm. The proposed LVM floor level for new CKs was 44 μg/dscm.

Based upon our re-evaluation of the database, the floor control and emission level discussed above for existing sources for LVMs would also appear to be appropriate for new sources. MACT floor control is a well-designed and properly operated PM control device (i.e., fabric filter, ESP) achieving the PM floor level of 0.030 gr/dscf. The Agency's evaluation of the LVM data results in a MACT floor of 63 μg/dscm.

Finally, individual metal floor levels for new sources are identical to those for existing sources. Thus, the standards would be: As 10 μg/dscm, Be 1.1 μg/dscm, and Cr (hexavalent) 4.6 μg/dscm.

d. BTF considerations for new sources. In the NPRM, the Agency considered a LVM BTF level, but determined that a BTF standard would not be cost-effective.

As discussed for existing sources, the Agency considered a more stringent PM emissions level for improved control of PM, SVM and LVM emissions for new CKs. Because both the alternative PM and LVM floor levels presented today are lower than the proposed floors, a BTF standard for either LVMs or individual As, Be, or Cr (hexavalent) standards based on improved PM control may be inappropriate in light of the cost-effectiveness concerns inherent in this scenario.

7. *Hydrochloric Acid and Chlorine* (*HCl/Cl_2*). a. MACT floor for existing sources. At proposal, the Agency identified floor control for total chlorine (i.e., HCl + Cl_2) as feedrate control of chlorine in the hazardous waste at an MTEC not to exceed 1.6 g/dscm, and proposed a floor standard of 630 ppmv. When we evaluated the revised database prior to today's notice, we used a data analysis method similar to that used at proposal. The floor control would be defined the same way as proposed, but the floor standard would be 120 ppmv. This standard should be readily achievable given that 93 percent of the test conditions in the revised database are meeting that level.

We used the following data analysis steps for both the proposed standard and today's alternative standard: (1) Rank emissions from lowest to highest; (2) define as floor control the highest hazardous waste chlorine MTEC for the 6 percent of sources [35] with the lowest emissions; and (3) define as the floor standard the highest test condition average emissions of any test condition operated at or below the floor MTEC (i.e., the expanded universe). We then refined the data analysis method in two respects based on an engineering evaluation of the revised database: (1) We did not add a computed emissions variability factor [36]; and (2) several test conditions were deleted from the expanded universe where an engineering evaluation revealed that SREs were significantly worse than the majority of other SREs.

In the case of total chlorine emissions for CKs, it appears not to be appropriate to use a breakpoint analysis to screen from the expanded universe sources that are not achieving an appropriate removal efficiency. This is because total chlorine is removed incidentally by reactions with the alkaline raw materials (e.g., limestone). Thus, it is difficult to reason that poor SRE is caused by poor design, operation, or maintenance of the control system. Nonetheless, we believe it is still appropriate to screen out clearly anomalous SREs because they are likely indicative of an incorrect MTEC value or emission measurement. An incorrect value for either could affect the floor standard.[37]

b. BTF considerations for existing sources. At proposal, the Agency defined BTF control as wet scrubbing with a 99 percent removal efficiency, but determined that a BTF standard would not be cost-effective. Given that the alternative floor level presented today would be substantially lower than the proposed floor, a BTF standard would be less cost-effective. Thus, we believe that our final analysis is likely to conclude that a BTF standard would not be warranted.

c. MACT floor for new sources. At proposal, the Agency defined floor control for new sources as hazardous waste feedrate control for chlorine at an MTEC of 1.6 g/dscm or less. The proposed floor standard was 630 ppmv, the same as the floor standard for existing sources.

Given that the alternative data analysis method discussed above for existing sources did not change the expanded universe, except to screen out test conditions with anomalous SREs, MACT floor control and the floor emission level would be the same as for existing sources: hazardous waste feedrate control for chlorine at an MTEC of 1.6 g/dscm or less, resulting in a floor standard of 120 ppmv (i.e., after screening out test conditions with anomalous SREs).

d. BTF considerations for new sources. The Agency proposed a BTF standard for new sources of 67 ppmv based on wet scrubbing. Given that under the revised data analysis method discussed today the floor standard would be much lower than proposed, the Agency believes that the economic impact analysis being conducted in support of the final rule is likely to raise significant concerns about cost-effectiveness. In that event, the Agency would promulgate the 120 ppmv floor standard for new sources.

8. *Carbon Monoxide* (CO). The Agency proposed the same MACT floor standards for CO for existing and new CKs, and determined that BTF controls would not be cost-effective. Floor control was defined for kilns with by-pass ducts as operation under good combustion practices and the standard was 100 ppmv, HRA, measured in the by-pass duct. For kilns without a by-pass duct (i.e., long wet and dry kilns), no CO standard was proposed given that CO levels in the main stack would not be an indicator of combustion efficiency. This is because CO can be generated by process chemistry (i.e., dissociation of CO_2 to form CO) and evolution from trace organics in the raw material feedstocks, as well as from combustion of fuels.

The Agency continues to believe that the proposed CO standard for kilns equipped with a by-pass duct would be appropriate. However, under one option being considered for limiting CO (and HC) emissions, kilns without a by-pass duct would also be required to comply with a CO limit based on the level achieved during the performance test demonstrating compliance with the HC limit. See discussion in Part Two, Section II.C.

Finally, the Agency continues to believe that a BTF standard for CO based on better combustion practices is likely to raise significant cost-effectiveness considerations.

9. *Hydrocarbons* (HC). The Agency proposed the same MACT floor standards for HC for existing and new CKs, and determined that BTF controls would not be cost-effective. Floor

[35] Or where we had data from fewer than 30 sources, the three sources with the lowest emissions (i.e., 3 represents the median of the five best performing sources).

[36] See previous discussion in the text. As we discussed at proposal (61 FR at 17396), the computed variability factor for this standard resulted in a standard that did not comport with engineering information on the APCDs at issue, engineering experience on facility performance within this source category, or the emissions database.

[37] The floor standard without screening the anomalous SREs would have been 160 ppmv.

control was defined for kilns with by-pass ducts as operation under good combustion practices and the standard was 6.7 ppmv, based on an hourly rolling average (HRA and measured in the by-pass duct. For kilns without a by-pass duct (i.e., long wet and dry kilns), floor control was defined as good combustion practices and use of raw materials with relatively low organic content, and the standard was 20 ppmv, HRA, measured in the main stack.

In evaluating the revised database for today's notice, the 20 ppmv standard still appears to be appropriate for the main stack of long kilns [38]. When considering by-pass kilns, however, the revised database still lacks HC emissions data for the only two CKs currently burning hazardous waste in units equipped with by-pass ducts. These two sources are complying with the BIF rules by documenting that CO levels are below 100 ppmv, HRA. [39] Under one attractive option for compliance with the CO and HC standards (i.e., sources would have the option of complying with either the CO or HC standard; see discussion in Part Two, Section II.C), we would expect that these two sources would continue to comply with the CO limit. Thus, it may not be necessary to establish a HC limit for them. However, given that it may be prudent to establish a HC limit for these by-pass kilns, we would transfer the good combustion practices-based HC standard for incinerators—10 ppmv, HRA—to these kilns. This is appropriate because: (1) Good combustion practices is floor control for CO and HC for these kilns as well as for incinerators; and (2) given that the good combustion practices-based CO standard is the same for incinerators and by-pass kilns, the good combustion practices-based HC standard should also be the same.

As discussed at proposal, the Agency continues to be concerned about cost-effectiveness considerations related to BTF controls for HC based on operating under better combustion practices.

G. Re-Evaluation of Proposed MACT Standards for Lightweight Aggregate Kilns

We discuss in this section the basis for the revised standards for LWAKs that could result from applying various engineering evaluation and data analysis methods to the revised emissions database [40]. A comparison of the proposed and potentially revised standards for existing and new sources is presented in the table below:

TABLE II.G:—REVISED STANDARDS FOR EXISTING AND NEW LWAKS [1]

HAP or HAP surrogate	Existing sources		New sources	
	Proposed standard	Revised standard	Proposed standard	Revised standard
D/F (ng TEQ/dscm)	0.20	0.20	0.20	0.20
Hg (µg/dscm)	72	47	72	47
PM (gr/dscf)	0.030	0.022	0.030	0.022
HCl/Cl2 (ppmv)	450	130	62	43
CO (ppmv)	100	100	100	100
HC (ppmv)	14	10	14	10
SVM (µg/dscm)	12	76	5.2	76
LVM (µg/dscm)	340	37	55	37

[1] All emission levels are corrected to 7% O_2.

1. *Dioxins and Furans* (D/F). a. MACT floor for existing sources. At proposal, the Agency had D/F emissions for only one LWAK and therefore pooled that LWAK data point with D/F data for CKs to identify MACT standards. Consequently, floor control and the floor emission level for LWAKs were the same as for CKs. The proposed floor control was ''temperature control at the inlet to the fabric filter [41] at 418 °F'', and the proposed floor emission level was ''0.20 ng TEQ/dscm, or temperature at the inlet to the fabric filter not to exceed 418 °F''. The Agency reasoned that pooling D/F data for LWAKs and CKs could be appropriate because both types of devices are designed and operated similarly with respect to factors that can affect surface-catalyzed D/F formation. Both LWAKs and CKs have high PM inlet loadings comprised primarily of entrained raw material and both are equipped with fabric filters that operate within the same temperature range.

Commenters on the proposed rule, however, argued that pooling LWAK and CK D/F data was inappropriate for purposes of establishing MACT standards for LWAKs. Since proposal, the Agency has obtained D/F emissions data from two additional LWAK facilities. These data are included in the revised emissions database and are used to identify the alternative standards presented here.

Based upon evaluation of the revised LWAK D/F database, our engineering evaluation of the data and other information on LWAK performance suggests the floor control can be specified as ''temperature control at the inlet to the fabric filter at 400 °F''. This would result in a floor emission level of ''0.20 ng TEQ/dscm, or 4.1 ng TEQ/dscm and temperature at the inlet to the fabric filter not to exceed 400 °F'.[42] Given that the entire revised database also comprises the expanded universe (all sources using floor control) the highest single run for the test condition

[38] The Agency did not propose a HC standard for the main stack of a preheater or preheater/precalciner kiln. See FR at 17397–8. The Agency is currently developing MACT standards for non-waste burning cement kilns, however. Any standards that the Agency may propose that are applicable to the main stack of a preheater or preheater/precalciner non-waste burning kiln may also be appropriate for the main stack of such hazardous waste burning kilns.

[39] The two kilns operating with by-pass ducts are Medusa's facility in Demopolis, AL, and Lone Star's facility in Cape Girardeau, MO. We note that Holnam has a long wet kiln in Clarksville, MO that has been retrofitted with a mid-kiln sampling port for purposes of monitoring CO in compliance with the BIF rule. That monitoring approach would be acceptable under the MACT rule as well.

[40] Additional details of the engineering and data analysis evaluations performed on the revised emissions database can be found in the Agency's background document: USEPA, ''Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database'', April 1997.

[41] All LWAKs currently burning hazardous waste are equipped with fabric filters.

[42] The standard would be expressed in the form of a TEQ level combined with a maximum temperature at the PM control device. This form of the standard is consistent with the revised data and would result in somewhat lower emissions (i.e., because without the TEQ limit, some sources could exceed that TEQ level at the specified temperature). Thus, expressing the standard in this form better achieves the statutory mandate to establish standards that provide the maximum degree of reduction that is achievable in practice.

with the highest run average would be a reasonable floor level from an engineering perspective. (Note that if this were a large data set, the floor level could be identified simply as the highest test condition average.) This floor level is more than 40 percent higher than the highest test condition average (because of substantial variability among the runs for that test condition), and thus appears to be a level that LWAKs should be able to meet routinely using floor control.

As discussed for CKs, temperature control to 400 °F or less is appropriate for floor control because, from an engineering perspective, it is within the range of reasonable values that could have been selected considering that: (1) The optimum temperature window for surface-catalyzed D/F formation is 450–750 °F; and (2) below 350 °F, kiln gas can fall below the dew point which can increase corrosion in fabric filters and reduce performance of the control device. In addition, more than three LWAKs in the revised database were operated at temperatures of 400 °F or less (even though we do not have D/F emissions data for them). Thus, this temperature level appears to be readily achievable.

Although only two of the three LWAKs for which we have D/F emissions data operated the fabric filter at 400 °F or lower (the third operated at 417 °F), we have fabric filter operating data for other LWAKs when performing emissions testing for other HAPs that document fabric filter operations at 400 °F or lower. The LWAK whose fabric filter was operated at 417 °F had lower D/F emissions than a kiln whose fabric filter was operated at 400 °F. Thus, even though our engineering evaluation did not explicitly include the LWAK whose fabric filter operated at 417 °F, defining MACT floor control as ‘‘temperature control at the inlet to the fabric filter at 400 °F’’ did not result in a lower MACT floor emission level (i.e., lower than 4.1 ng TEQ/dscm). Rather, doing so ensures that LWAKs will be operating at floor levels consistent with sound operational practices for controlling D/F.

b. BTF considerations for existing sources. The Agency proposed a BTF standard of 0.20 ng TEQ/dscm based on ACI operated at a temperature of ≤400 °F.

Upon evaluation of the revised LWAK D/F database, LWAKs appear to be able to achieve a 0.20 ng TEQ/dscm standard simply by rapidly quenching combustion gases at the exit of the kiln to ≤400 °F, and insulating the duct-work leading to the fabric filter to maintain gas temperatures and avoid dew point problems. Although the data are not conclusive, and further testing is warranted to confirm this approach, our engineering evaluation of all available information indicates that this approach should be feasible.[43] If this approach proves to be less effective than anticipated, then ACI can be used to achieve the BTF standard.

We continue to believe that this BTF standard is appropriate given the concerns the Agency has expressed about the risks posed by D/F emissions. See discussion regarding a D/F BTF standard for CKs at 61 FR 17392. Further, a BTF standard of 0.20 ng TEQ/dscm would preclude the need to provide further controls under RCRA authority.

c. MACT floor for new sources. At proposal, the BTF considerations for new LWAKs were the same as for new CKs, and the proposed standards were the same.

Upon evaluation of the revised LWAK D/F database, the floor control and emission level discussed above for existing sources would also appear to be appropriate for new sources (i.e., ‘‘temperature control at the inlet to the fabric filter at 400 °F’’ corresponding to an emission level of ‘‘0.20 ng TEQ/dscm, or 4.1 ng TEQ/dscm and temperature at the inlet to the fabric filter not to exceed 400 °F’’. Our engineering evaluation indicates that the best controlled source is one that is controlling temperature control at the inlet to the fabric filter at 400 °F.

d. BTF considerations for new sources. The Agency proposed ACI as BTF control and a BTF standard of 0.20 ng TEQ/dscm. We continue to believe that this BTF standard is appropriate for new sources for the same reasons discussed above in the context of existing sources. Note that BTF control, as for existing sources, would be defined as rapid quench of kiln gas to ≤400 °F combined with duct insulation, as required, or ACI operated at ≤400 °F.

2. *Mercury* (Hg) a. MACT Floor for existing sources. At proposal, the Agency identified floor control as hazardous waste feedrate control not to exceed an MTEC of 17 μg/dscm. EPA proposed a floor standard of 72 μg/dscm.

All LWAKs employ fabric filters and one source uses a fabric filter and venturi scrubber to control mercury. However, since Hg is generally in the vapor form in and downstream of the combustion chamber, including the air pollution control device, fabric filters alone do not achieve good mercury control. Mercury emissions from LWAKs are currently controlled under the BIF rule, which establishes limits on the maximum feedrate of Hg in total feedstreams (e.g., hazardous waste, raw materials). Thus, MACT is based on hazardous waste feed control.

Review of the updated Hg data in the revised database indicate that LWAKs did not conduct Hg spiking of the hazardous wastes with the exception of one facility, and thus the Hg content in the wastes during testing is likely representative of typical operations. The data from this testing also show that raw materials can represent a significant source Hg input to the kiln system. Since the best performing sources, measured by Hg emissions, do not employ a dedicated device capable of Hg control, the Agency believes that the Hg data are essentially ‘‘normal’’ even though generated during worst case compliance testing conditions for other parameters.

To evaluate these revised data for the purpose of determining a MACT floor, the Agency used the following data analysis steps: (1) Rank Hg emissions from lowest to highest; (2) conduct a breakpoint analysis on the ranked Hg emissions data, and (3) establish the floor standard equal to the test condition average of the breakpoint source. The breakpoint analysis reflects an engineering evaluation of the data and ensures that the one source that spiked elevated quantities of Hg did not drive the floor level upward to levels higher than the preponderance of this ‘‘normal’’ data indicates is routinely achievable. The Agency’s analysis results in a MACT floor level of 47 μg/dscm. The revised database indicates that approximately 75 percent of LWAKs are achieving this floor level.

b. BTF considerations for existing sources. The Agency originally considered a BTF standard based on flue gas temperature reduction to 400 °F or less followed by ACI, but determined that a BTF level would not be warranted.

EPA continues to believe that flue gas temperature reduction to 400 °F followed by ACI is the appropriate BTF control option for improved Hg control at LWAKs. As discussed above for existing CKs, we have assumed an ACI effectiveness of 60 percent in identifying BTF levels for LWAKs for the purposes of today’s analysis. Thus, the BTF standard is 15 μg/dscm which is based on a ACI efficiency of 60 percent applied to the floor level of 33 μg/dscm. Going to a BTF standard of 15 μg/dscm for mercury is consistent with the range examined in the proposal.

[43] See USEPA, ‘‘Draft Technical Support Document for HWC MACT Standards (NODA), Volume I: MACT Evaluations Based on Revised Database’’, April 1997.

However, at proposal, significant cost-effectiveness issues were raised (and commented extensively on). It is likely that those same issues would arise here with respect to a BTF standard of 15 µg/dscm.

c. MACT floor for new sources. At proposal, the Agency identified floor control as hazardous waste feedrate control not to exceed an MTEC of 17 µg/dscm—the same as existing sources. Thus, EPA proposed an identical floor standard of 72 µg/dscm.

For the same reasons discussed for existing LWAKs, the Agency believes that the most appropriate engineering evaluation and data analysis method to identify the floor level is identical to the analysis done for existing sources. Thus, the MACT Floor standard would be 47 µg/dscm for new LWAKs.

d. BTF considerations for new sources. The Agency considered a BTF standard for new sources based on ACI, but determined that it would not be cost-effective to adopt the BTF standard. The Agency continues to consider the use of ACI as the BTF technology. In evaluating the revised database, EPA has identified a level of 15 µg/dscm as the BTF standard for new sources based on ACI and flue gas temperature reduction to 400 °F or less. This is based on a source achieving the MACT new floor level of 33 µg/dscm and then applying ACI with a 60 percent removal efficiency. Again, in light of the reasons identified for existing sources, the Agency has concerns as to whether a BTF level based on ACI will ultimately be warranted for new LWAK sources.

3. *Particulate Matter* (PM). a. MACT Floor for Existing Sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio of 2.8 acfm/ft^2. The MACT floor was 0.049 gr/dscf.

In evaluating the revised database, we examined a refined engineering evaluation and data analysis method to identify a MACT floor. This evaluation was a four-step process: (1) Rank all PM emissions data and identify the MACT floor controls used by the best performing 6 percent of sources. (2) Develop the expanded universe to include all sources employing MACT control, without further characterizing MACT control (e.g., air-to-cloth ratio of the fabric filter) as done in the proposal because we do not have sufficient data on the detailed design, operating, and maintenance characteristics related to test conditions in the revised database. Since all LWAKs use fabric filters for PM control, all test condition data are included in the expanded universe. (3) For each PM test condition, evaluate the corresponding SVM SRE and screen out sources that have relatively poor SREs (i.e., outliers above a breakpoint in the data array), which is an indicator of poor design, operation, and maintenance characteristics of the MACT controls at the source. (4) Identify the MACT floor equal to the highest test condition average of all test conditions in the PM expanded universe.

The Agency's evaluation of the LWAK PM data results in a MACT floor of 0.022 gr/dscf. All LWAK test condition data are achieving 0.022 gr/dscf.

LWAKs typically operate at higher stack oxygen concentrations compared to other combustion systems due to the LWAK manufacturing process (e.g., excess air is forced into the kiln to aid in the expansion of the raw material into lightweight aggregate). Typical stack oxygen concentrations range from 12 to 16 percent, while CKs, for example, typically range from 3 to 8 percent. Since the standards are expressed at 7 percent oxygen, the floor standard of 0.022 gr/dscf would be equivalent to 0.014 gr/dscf at 12 percent oxygen and 0.008 gr/dscf at 16 percent oxygen under the conditions that LWAKs typically operate.

In the NPRM, the Agency proposed that sources maintain continuous compliance with the PM standard through the use of a PM CEMS. A decision whether to require LWAKs to install a PM CEMS will be made at the completion of an on-going demonstration testing program to determine if at least one PM CEMS can meet the proposed performance specifications. Since the floor standard discussed above was based on manual test method data, the Agency will re-evaluate at the completion of the CEMS testing program whether these PM floor standards would be appropriate in the event that the final rulemaking requires continuous compliance with a PM CEMS. The Agency will notice the results and conclusions of the demonstration test program in the docket for the HWC rule.

b. BTF considerations for existing sources. In the NPRM, the Agency proposed a BTF level of 0.030 gr/dscf and solicited comment on an alternative BTF level of 0.015 gr/dscf based on improved PM control.

Based on the revised database, we can evaluate a reduced PM emissions level lower than 0.022 gr/dscf as the BTF standard (in conjunction with BTF reductions in SVMs and LVMs). This would require an improved PM collection technology such as the use of more expensive fabric filter bag material. Given that the alternative floor level analysis presented today would be substantially lower than the proposed floor and BTF levels, significant cost-effectiveness considerations come into play and suggest that BTF levels may not ultimately prove to be warranted.

c. MACT floor for new sources. At proposal, EPA defined floor control for new sources as a fabric filter with an air-to-cloth ratio of 1.5 acfm/ft^2. The MACT floor was 0.054 gr/dscf.

Based upon evaluation of the revised database, the floor control and emission level discussed above for existing sources would also appear to be appropriate for new sources. Therefore, MACT floor control is a well-designed and properly operated fabric filter, and the MACT floor for new LWAKs is 0.022 gr/dscf.

d. BTF considerations for new sources. In the NPRM, EPA proposed a BTF standard of 0.030 gr/dscf based on improved PM control, which was consistent with existing sources.

Today, as discussed above for existing source BTF considerations and based upon examining the revised database in light of the findings at proposal, a BTF standard for new sources beyond 0.022 gr/dscf (and corresponding BTF reductions for SVMs and LVMs) would not appear to be cost-effective.

4. *Semivolatile Metals (SVM) (cadmium and lead)*. a. MACT floor for existing sources. At proposal, EPA defined floor control as either (1) a fabric filter with an air-to-cloth ratio of 1.5 acfm/ft^2 with a hazardous waste (HW) MTEC less than 270,000 µg/dscm, or (2) a combination of a fabric filter and venturi scrubber with an air-to-cloth ratio of 4.2 acfm/ft^2 and a HW MTEC less than 54,000 µg/dscm. The proposed floor level was 12 µg/dscm.

LWAKs use a combination of good PM control and limiting hazardous waste feedrates to control SVM emissions. SVMs are controlled most efficiently by technologies which are effective at capturing fine PM, such as fabric filters which are employed by all LWAKs. EPA's revised database shows that SVM emissions vary substantially from 3 to over 1600 µg/dscm with 60 percent below 80 µg/dscm and the remaining 40 percent above 400µg/dscm.

The refined data analysis method used by EPA to evaluate and identify a MACT floor would be based directly on the results from the PM floor analyses discussed above. As mentioned there, 0.022 gr/dscf would appear to represent the MACT floor for LWAKs based on good PM control. Since SVMs are controlled, in part, by a well-designed and operated PM control devices, it follows that sources achieving this PM performance level should also be controlling SVMs emissions.

Therefore, in its refined SVM analyses of the revised database, the Agency would first consider all SVM data when corresponding PM measurements are below 0.022 gr/dscf. To identify the SVM floor from these data, we identify either at the highest SVM test condition average or the level that excludes sources achieving substantially poorer SVM control than the majority of sources. It is most likely appropriate to use the latter approach—excluding sources with significantly poorer SVM performance—because their higher SVM emissions may be the result of exceedingly high SVM feedrates or some other factor which is not able to be discerned from the data available to the Agency. An SVM emissions breakpoint analysis is the approach for excluding these poorer performing test conditions.

Applying this evaluation technique to the revised LWAK SVM database results in a MACT floor of 76 μg/dscm. Approximately 62 percent of LWAK SVM test condition data are currently achieving this emissions level.

Finally, as discussed in an earlier section, a preliminary analysis indicates that MACT standards may not be warranted for one HAP metal, antimony. Since the number of metals being considered for MACT standards may change, we are investigating the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). Using the refined method discussed above for SVM, we analyzed the revised database with respect to Cd and Pb data. The floor analysis corresponding to PM measurements below 0.022 gr/dscf would result in the following floor levels: Cd 53 μg/dscm, and Pb 67 μg/dscm.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for SVMs based on improved PM control. However, the Agency concluded that a BTF standard would not be cost-effective given that the SVM floor level of 12 μg/dscm alone would result in an estimated 97 percent SVM reduction in emissions.

As discussed for PM BTF considerations, the Agency also re-evaluated the possible appropriateness of using a reduced PM emissions level based on improved PM control as a BTF standard (with corresponding BTF reductions in SVMs and LVMs). Even though the alternative SVM floor standard is higher than at proposal, our preliminary judgement is that significant cost-effectiveness considerations will be nonetheless encountered in a final analysis of whether to establish a BTF standard for SVMs or for Pb or Cd individually.

If, however, the revised risk assessment yet to be conducted would show significant risk at a SVM floor standard of 76 μg/dscm, which would be the floor level resulting from application of the data analysis method discussed above, the Agency will determine whether a BTF standard based on control of SVM feedrate to levels below those at the floor would be appropriate. This feedrate limitation would in turn reduce SVM emissions. The BTF standard and the corresponding level of feedrate control would be dictated by considerations of cost-effectiveness and the need to establish more stringent RCRA-related controls.

c. MACT floor for new sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio of 1.5 acfm/ft^2 with a hazardous waste (HW) MTEC less than 270,000 μg/dscm. The proposed floor level was 5.2 μg/dscm.

Upon evaluation of the revised database, EPA believes that the floor control and emission level discussed above for existing sources for SVMs would also be appropriate for new sources. In this event, MACT floor control would be a well-designed, operated and maintained PM control device (e.g., fabric filter) achieving the PM floor level of 0.022 gr/dscf. The Agency's evaluation of the SVM data results in a MACT floor of 76 μg/dscm.

Finally, based on the revised database, individual metal floor levels for new sources are identical to those for existing sources. Thus, individual Cd and Pb standards are 53 μg/dscm for Cd and 67 μg/dscm for Pb.

d. BTF considerations for new sources. In the NPRM, the Agency considered a SVM BTF level, but determined that a BTF standard would not be cost-effective.

As discussed for existing sources, the Agency considered a more stringent PM emissions level for improved control of PM, SVM and LVM emissions for new LWAKs in light of the revised database. Even though the SVM floor standard is higher than at proposal, as discussed above, cost-effectiveness issues are again raised and suggest that a BTF standard for either SVMs or for Pb or Cd individually based on improved PM control may likewise ultimately prove to be inappropriate.

5. *Low Volatile Metals (LVM) (arsenic, beryllium, and chromium)* a. MACT Floor for Existing Sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio of 1.8 acfm/ft^2 with a HW MTEC less than 46,000 μg/dscm.

The proposed floor level was 340 μg/dscm, which included antimony.

LWAKs use a combination of good PM control and limiting hazardous waste feedrates to control LVM emissions. LVMs are less likely to vaporize at combustion temperatures and therefore partition primarily to the residue or adsorb onto particles in the combustion gas. EPA's database shows that LVM emissions vary from around 20 to 285 μg/dscm.

The engineering evaluation data analysis method used by EPA to evaluate the revised database and identify a MACT floor for LVMs is also related directly to the PM floor analysis. As was determined in the PM analysis, a floor of 0.022 gr/dscf represents MACT for LWAKs based on good PM control. Considering all LVM data from sources achieving a PM level 0.022 gr/dscf or better, EPA's evaluation of the revised LWAK data results in a LVM floor of 37 μg/dscm (excluding sources above a breakpoint and therefore achieving substantially poorer LVM emissions than the majority of sources). Approximately 71 percent of LWAK LVM test condition data are currently achieving this emissions level.

Finally, as discussed for SVMs, EPA is continuing to investigate the appropriate structure of metals standards (e.g., retain the volatility groups or establish individual metals standards). The Agency analyzed individual As, Be, and Cr (hexavalent) data and established individual metal floor levels consistent with the engineering evaluation and data analysis method. Where PM measurements are below 0.022 gr/dscf, the result would be: As 22 μg/dscm, Be 3 μg/dscm, and Cr (hexavalent) 6.2 μg/dscm.

The Agency is concerned that some of the potential floor standards for some individual metals (e.g., Be, Cr (hexavalent)) may be present at levels approaching practical quantitation limits (PQLs). PQLs are the lowest level of quantification that the Agency believes a competent analytical laboratory can be expected to reliably achieve. The Agency will investigate whether this issue may need to be addressed in the development of any individual metals standards that may be considered for the final rulemaking. We invite comment on the issue of PQLs and LVM BTF standards.

b. BTF considerations for existing sources. In the NPRM, the Agency considered a BTF standard for LVMs based on improved PM control. However, the Agency concluded that a

BTF standard would not be cost-effective.

As discussed for PM BTF considerations, the Agency also re-evaluated the possible appropriateness of using a reduced PM emissions level based on improved PM control as a BTF standard (with corresponding BTF reductions in SVMs and LVMs). Considering that the alternative LVM floor standard would be lower than at proposal, our preliminary judgment is that significant cost-effectiveness considerations will likely be encountered in a final analysis of whether to establish a BTF standard for either LVM or for As, Be, or Cr (hexavalent) individually.

c. MACT floor for new sources. At proposal, EPA defined floor control as a fabric filter with an air-to-cloth ratio of 1.3 acfm/ft^2 with a hazardous waste (HW) MTEC less than 37,000 μg/dscm. The proposed floor level was 55 μg/dscm.

Based upon our re-evaluation of the database, the floor control and emission level discussed above for existing sources for LVMs would also appear to be appropriate for new sources. MACT floor control is a well-designed and properly operated PM control device (i.e., fabric filter) achieving the PM floor level of 0.022 gr/dscf. The Agency's evaluation of the LVM data would result in a MACT floor of 37 μg/dscm.

Finally, individual metal floor levels for new sources are identical to those for existing sources. Thus, the standards would be: As 22 μg/dscm, Be 3 μg/dscm, and Cr (hexavalent) 6.2 μg/dscm.

d. BTF considerations for new sources. In the NPRM, the Agency considered a LVM BTF level, but determined that a BTF standard would not be cost-effective.

As discussed for existing sources, the Agency considered a more stringent PM emissions level for improved control of PM, SVM and LVM emissions for new LWAKs. Because the alternative PM and LVM floor levels presented today are lower and approximately equivalent, respectively, than the proposed floors, a BTF standard for either LVMs or individual As, Be, or Cr (hexavalent) standards based on improved PM control may be inappropriate in light of the cost-effectiveness concerns inherent in this scenario.

6. *Hydrochloric Acid and Chlorine (HCl/Cl_2)* a. MACT floor for existing sources. At proposal, the Agency identified floor control for total chlorine as either: (1) Hazardous waste feedrate control of chlorine to a MTEC of 1.5 g/dscm or less; or (2) venturi scrubber with hazardous waste MTEC of 14 g/dscm or less. The proposed floor emission level was 2100 ppmv.

Upon evaluation of the revised database, the data analysis method used at proposal appears still to be appropriate and, consequently, floor control would be defined virtually the same as at proposal. However, EPA no longer thinks it appropriate to add a computed emissions variability factor to the standard-setting test condition for large data sets[44]. Thus, the floor emission level would be 1300 ppmv rather than 2100 ppmv.

b. BTF considerations for existing sources. At proposal, the Agency defined BTF control as wet or dry lime scrubbing with a control efficiency of 90 percent and proposed a BTF standard of 450 ppmv.

The Agency continues to believe that wet or dry lime scrubbing can achieve at least 90 percent removal of HCl/Cl2. Therefore, the revised BTF standard would be 130 ppmv assuming that the requisite cost-effectiveness information continues to suggest that a BTF standard is warranted. The two LWAKs that are equipped with wet scrubbers achieved emission levels below 45 ppmv.

c. MACT floor for new sources. At proposal, the Agency defined MACT floor control for new sources as a venturi scrubber with a hazardous waste MTEC of 14 g/dscm or less, and identified a floor level of 62 ppmv.

As for existing sources, the data analysis method used at proposal for new sources is appropriate and, consequently, floor control for new sources would be defined the same as at proposal. Excluding a computed emissions variability, the floor emission level would be 43 ppmv rather than 62 ppmv.

d. BTF considerations for new sources. The Agency did not propose a BTF standard for new sources because the floor standard was based on best available control technology: wet scrubbing. We have no new information in the revised database that would indicate that this conclusion at proposal should be revisited.

7. *Carbon Monoxide* (CO). The Agency proposed a MACT standard for CO of 100 ppmv based on a hourly rolling average (HRA). We continue to believe that this standard is appropriate for the reasons expressed in the preamble to the proposal.

8. *Hydrocarbons* (HC). The Agency proposed a HC level of 14 ppmv based on floor control using good combustion practices. Although we continue to believe that floor control is good combustion practices, our engineering evaluation of the revised database suggests that a floor standard of 10 ppmv, HRA, may be more appropriate. The single LWAK facility in the revised emissions database that could not achieve a HC standard of 10 ppmv (perhaps because of trace organics in the raw material) has stopped burning hazardous waste. Data from that facility have been excluded in the revised analysis. Although the remaining LWAKs appear to be able to meet a HC standard on the order of 6 ppmv, it may be more appropriate to establish the standard at 10 ppmv. This is because we are not aware of an engineering reason that LWAKs using good combustion practices should be able to achieve lower HC emissions than incinerators. Given that the incinerator HC standard would be 10 ppmv, that standard also appears to be appropriate for LWAKs.

Part Three: Implementation

I. Compliance Date Considerations

The Agency proposed that all sources subject to the final rule be in compliance with the final standards three years following the effective date of the rule (61 FR 17416). The proposed compliance period is consistent with the CAA, which defines the maximum compliance period for sources regulated under the statute as three years, with the possibility of a one-year extension for those sources that adequately demonstrate a need for additional time for the installation of emission controls. The Agency proposed the maximum compliance period allowed by the Act because this rule will likely require the majority of units, currently operating under RCRA regulations, to undergo substantial modifications to come into compliance with the potentially more stringent final MACT standards.

The general provisions of 40 CFR Part 63 do not require a demonstration of compliance until 240 days following the compliance date. This 240 day period between the compliance date and the demonstration of compliance is clearly not appropriate for HWCs because these devices are presently regulated under RCRA via enforceable operating limits, and in this interim period the enforceable operating limits would be undefined (61 FR 17415).

Therefore, to provide consistency with the currently-applicable RCRA regulatory compliance scheme, the Agency departed from the general requirements applicable to MACT sources and proposed a revised definition of compliance date. The proposed definition of compliance date would require sources to complete installation of controls and to

[44] See discussion in Part Two, Section II.D.

successfully complete performance testing and certify compliance *within* the three-year compliance period, not by a date 240 days after the three-year compliance period. *Id.* In addition to the revised definition of compliance date, the Agency also proposed a number of extra consequences for HWC sources that are not in compliance by the compliance date: (1) Immediate termination of waste-burning activities; (2) loss of RCRA permit or interim status; (3) a requirement to obtain a new RCRA permit; and (4) compliance with MACT standards for new sources.

In response to the proposal, the Agency received comments suggesting the three-year compliance period would be impossible to meet due to a number of competing factors, and that more time would be necessary to comply with the rule. These factors included permit modification, installation of controls, and documentation of compliance. Furthermore, commenters expressed serious concerns about combining these factors with the consequences of missing the compliance date. Industry commented that under this proposed approach facilities engaged in legitimate efforts to comply with the standards would be forced to terminate waste-burning activities, and be subjected to burdensome consequences that are unnecessary to protect the environment or ensure the public's safety.

However, EPA has become persuaded by commenters concerns regarding the ability of HWC sources in particular to comply with the proposed standards by the compliance date. Sources will have to modify their RCRA permits. Further, some sources may choose to pursue waste minimization strategies. For these reasons, the Agency is considering certain actions that may be finalized in advance of the final HWC rule such as, the streamlined permit modification procedures discussed at 17455 in the proposal; as well as, the waste minimization option for extension of the compliance date to allow for the application of waste minimization controls to meet the final standards discussed at 17417. The streamlined permit modification procedures would reduce the administrative requirements and time necessary to begin modification procedures required to comply with the final standards. The waste minimization compliance date extension option, which provides an additional avenue for facilities to request an extension of the compliance date, would afford facilities that choose to institute waste minimization measures an additional year to complete these actions.

However, even with the special provisions under consideration, sources may require the full amount of time allowed under the CAA to comply. Therefore, the Agency is also considering a revised implementation scheme that will allow for a simplified approach consistent with the implementation of general CAA-MACT rules. This approach would provide both additional relief to sources complying with the final rule, and information regarding a source's compliance status on the compliance date for the Agency. The specifics of this new option are explained in greater detail in the following paragraphs. Comments are requested on this new approach to implementing the HWC MACT standards.

A. Definition of Compliance Date

Today, the Agency is considering a revision to the proposed definition of compliance date. Under this revised approach, HWC sources would follow the CAA-MACT schedule for demonstration of compliance, through MACT performance testing and submission of test results, contained in § 63.7. Under that section, affected sources must conduct performance tests within 180 days following the compliance date, and submit the results of the tests 60 days following the completion of the performance test.[45] This CAA-based approach responds to the comments questioning our revised definition of compliance date and would achieve a more consistent implementation framework. However, because the Agency is concerned about the compliance status of affected sources on the compliance date, the Agency also seeks comment on provisions to enhance the general requirements for HWCs with a requirement for the submission of a ''precertification of compliance'' in the final rule. A precertification of compliance would require facilities to precertify their compliance status on the compliance date. The details of the precertification of compliance are described in greater detail in the following paragraphs.

B. Pre-Certification of Compliance

Today the EPA is seeking comment on an option which would require sources to submit a notification to regulatory agencies that details the operating limits a unit will be operated under in the interim period following the compliance date but before the results of the initial comprehensive performance test are submitted. This notification, the precertification of compliance, would include all of the information necessary to determine the compliance status of an affected source (e.g., automatic waste feed cutoff limits, feedrate limits, emission control device operating limits, etc.) during the 240 day period after the compliance date. At a minimum, the facility would be required to establish operating limits on all of the parameters identified in the proposed monitoring requirements found in table V.2.1 at 17419 of the proposed rule. This approach is appropriate because these facilities are already regulated under RCRA. There should not be any ambiguity for these facilities in terms of being between regulatory regimes at any point in time.

The operating limits in the precertification of compliance would be enforceable limits.[46] However, if following the initial comprehensive performance test, the facility's precertification of compliance designated operating limits are found to have been inadequate to ensure compliance with the MACT standards, the facility will not be deemed out of compliance with the MACT emissions standards. EPA invites comment on this approach, and specifically invites comment on the necessity of establishing operating limits on the entire set of parameters identified in table V.2.1.

C. Consequences of Non-compliance

As mentioned earlier, the Agency proposed a number of serious consequences that would befall a source that misses the compliance date (61 FR 17416). The Agency proposed these consequences to provide an incentive for affected sources to move swiftly to comply with the final standards. In response to the proposal, through written comments from industry and during round table discussions with

[45] In the HWC proposed rule, however, the Agency allowed sources 90 days to submit test results because D/F analyses can require more time than traditional MACT analyses. We continue to believe that this 90-day allowance is appropriate.

[46] The Agency notes that under this scheme facilities are still subject to the RCRA emission limitations, and the associated operating limits and enforcement actions until removal of the air emission limitations from the RCRA permit. However, because on the compliance date all facilities must be compliance with the emission standards of the final MACT rule, the Pre-COC operating limits, which are expected to be more stringent than current RCRA emission standards, take precedence over the RCRA permit limits except where the RCRA permit limits are based on a more stringent standard adopted under the Omnibus provisions of RCRA section 3005. Furthermore, EPA notes that compliance with Pre-COC operating limits that are based on standards that are more stringent than RCRA emission standards assures compliance with the RCRA based emission standards.

affected parties, the Agency received information suggesting that imposition of these consequences through regulatory language was unnecessary. Consequently, the Agency is considering deleting those specific consequences from the regulatory language and relying on the regulating agency's policy regarding enforcement response to govern the type of enforcement response at a facility that fails to meet the compliance deadline.

Upon review of this enforcement process, the Agency is presently inclined to apply the normal CAA enforcement procedures to non-compliant sources in the final rule for hazardous waste combustors.

II. Compliance Requirements

In this section, we discuss several compliance issues: (1) Compliance with carbon monoxide (CO) and/or HC emission standards; (2) compliance with a startup, shutdown, and malfunction plan when not burning hazardous waste; (3) metals extrapolation and interpolation considerations; (4) site-specific variances for cement kilns and LWAKs because of inability to meet the standards solely due to metals or chlorine in raw materials; and (5) emissions averaging for cement kilns with unique design or operating features.

A. Compliance With CO and/or HC Emission Standards

The Agency proposed MACT emission standards for both CO and HC for incinerators and LWAKs as surrogates to control emissions of organic HAPs. Cement kilns would be required to comply with either a CO or HC standard because of raw material considerations. See 61 FR at 17375–6. The Agency explained that relying on only CO or HC alone appeared to have drawbacks, and thus proposed that incinerators and LWAKs comply with emissions standards for both. Nonetheless, the Agency acknowledged that requiring compliance with standards for both CO and HC may be unnecessarily redundant, and requested comment on the following alternative approaches: (1) Giving sources the option of complying with either CO or HC; or (2) establishing a MACT standard for either CO or HC, but not both.

Although the Agency is continuing to evaluate comments and options [47] on how to limit CO and/or HC to control organic HAPs, we invite comment on an additional feature of the first option whereby a source can elect to comply with either the CO or HC standard. Under this approach, a source that elects to comply with the CO standard (rather than the HC standard) would be required to document during the performance test compliance with the HC limit. This is necessary because we have some (limited) data that show a source can have HC levels exceeding the standard discussed in today's notice while meeting the CO limit. Even though the vast majority of the data indicate that HC will be low when CO levels are low, a requirement to confirm this relationship on a site-specific basis may be warranted.

To confirm the relationship during the performance test, the source would use a portable HC monitor to document that HC levels are below the MACT standard. This is not expected to be a burdensome test. Further, however, to ensure that the CO/HC relationship is maintained over the range of operating conditions that the facility may ultimately employ, we are considering whether to require the source to establish limits on key operating parameters than can affect combustion efficiency (and thus HC emissions). The limits would be established based on parameter values observed while demonstrating the CO/HC relationship during the performance test.

We specifically request comment on which key parameters should be limited to ensure that the CO/HC relationship is maintained. Further, we request comment on whether these key parameters should be identified on a national basis or a site-specific basis during review of the performance test protocol. In providing comment, note that the Agency has already proposed to establish site-specific limits on several combustion-related parameters to ensure compliance with the D/F emission standard (e.g., minimum combustion chamber temperature; maximum waste feedrate; and for batch fed units, maximum batch size and feeding frequency, and minimum oxygen concentration in the combustion gas). In addition, note that it may be appropriate to identify as key parameters (for purposes of ensuring that the CO/HC relationship is maintained) those parameters for which limits are currently established during destruction and removal efficiency (DRE) testing, including: (1) Minimum combustion temperature at each combustion chamber or feed location; (2) minimum combustion gas residence time (i.e., maximum combustion gas velocity, or appropriate surrogate); and (3) minimum combustion gas oxygen concentration. If the Agency determines that DRE testing is not necessary for some types of sources as discussed in Section III below, testing to document the CO/HC relationship would be used to establish limits on these heretofore DRE-limited parameters.

B. Startup, Shutdown, and Malfunction Plans

The Agency proposed that startup, shutdown and malfunction plans are not necessary for hazardous waste combustion sources because the allowances that such plans provide are not appropriate for hazardous waste combustors (61 FR 17449). Specifically, the Agency stated that EPA did not need information regarding how quickly a source is able to correct a malfunction to come back into compliance with the standards because affected sources cannot burn waste unless the source is in compliance with all applicable standards.

However, in comments, the Agency was informed of a few situations in which it is appropriate for sources to comply with a startup, shutdown, and malfunction plan. These situations include those in which sources temporarily stop burning hazardous waste but intend to resume burning hazardous waste in the near future. The examples presented to the Agency involve production units (i.e., cement kilns, LWAKs, and possibly on-site incinerators equipped with waste heat boilers to generate steam or heat at a chemical production facility) that must continue operations following waste feed cutoff to maintain production at the facility. Also, commenters cited temporary shutdowns necessary for planned maintenance to be performed on the unit.

In light of these comments, the Agency is rethinking its proposed approach and requests comment on a requirement for sources to comply with the provisions listed in § 63.7 regarding startup, shutdown and malfunction plans, including the reporting requirements of § 63.10(d)(5)(I). These provisions would apply at HWCs when waste is not being fed or does not remain in the combustor, excluding automatic waste feed cutoff events.

Sources would be subject to the standards at all times, and the malfunction plan would only apply during times when the source is either temporarily not burning waste or when

[47] We are also evaluating another option whereby compliance with the HC limit would be required, and a site-specific CO limit (but not lower than 100 ppmv, the proposed MACT standard) would also be established. This option would provide assurance that HC emissions are within allowable levels, and by also limiting CO, it would give the operator advance notice of a potential increase in HC levels, thus helping to avoid an exceedance of the HC standard.

waste no longer remains in the combustor. For example, if a source is temporarily not burning waste and a malfunction occurs that is followed by an exceedance of an applicable standard, the source will not be in violation as long as it is complying with the procedures outlined in the malfunction plan. On the other hand, if a source is burning waste and a malfunction occurs that necessitates an automatic waste feed cutoff followed by an exceedence of a standard, the source would be in violation regardless of whether the source is complying with the malfunction plan.[48]

Therefore, under this option, a source may develop a malfunction plan that details the situations in which the source is intentionally not feeding waste, or that details the situations when certain emission control devices will not be in operation.

C. Metals Extrapolation and Interpolation Considerations

In the NPRM, the Agency discussed the operating conditions under which a source will likely operate to demonstrate compliance with the metals emission limits identified in the proposed rule (61 FR at 17428–30). The Agency also acknowledged in the proposal that operators will likely want to operate their units during comprehensive performance tests close to the edge of the operating envelope so that they can comply with the emission standards and still achieve the necessary operational flexibility required by the facility. EPA further stated that, to achieve a sufficient level of operational flexibility, sources could be expected to engage in the spiking of metals into the waste matrix, which is a practice that concerns the Agency. EPA's concern extends to the overall metals loading to the environment (for example, Hg and Pb), exposure of facility employees, and exposure of surrounding community to higher than normal metals concentrations due to testing procedures that are for the purposes of developing waste feedrate limits and operational flexibility.

Therefore, the Agency has investigated approaches that may provide a method to afford additional metals feedrate flexibility without the need of high metals spiking (otherwise necessary to identify a metals feedrate for an associated metals emission level).[49] One promising approach would use a statistical extrapolation methodology.[50]

Under this approach a source would use the metal feedrates and emission rates associated with a MACT performance test to extrapolate to higher allowable feedrates and emission rates. The Agency believes that the upward extrapolation procedure developed can conservatively be used to allow for higher metals feedrate limits, but still ensure that the facility is well within any applicable MACT (or RCRA) emissions limit.[51] Although downward interpolation (i.e., between the measured feedrate and emission level and zero) was also investigated, the Agency is concerned that downward interpolation may not be conservative primarily because system removal efficiency decreases as metal feedrate decreases. Thus, projected emissions at lower feedrates may in fact be lower than actual emissions. Consequently, the Agency is not inclined to allow downward interpolation.

The Agency expects that any extrapolation methodology would be reviewed and approved by regulatory officials. Sources would request approval to extrapolate feedrates as part of the performance test plan that would be submitted at least 60 days prior to the test date. See § 63.7(b) and (c) and proposed § 63.1208. The review would consider in particular whether: (1) Performance test metal feedrates were appropriate (e.g., whether feedrates were at least at normal levels; depending on the heterogeneity of the waste, whether some level of spiking would be appropriate; and whether the physical form and species of spiked material is appropriate); and (2) whether the requested, extrapolated feedrates were warranted considering historical metal feedrate data. In addition, regulatory officials would review the performance test results in making a finding of compliance required by § 63.6(f)(3) to ensure that emission test results have been interpreted properly and that the extrapolation procedure is appropriate for the source.

The Agency is discussing this approach with some hesitation because facilities would be able to: (1) Feed metals at higher rates without a specific compliance demonstration of the associated metals emissions; and (2) obtain approval to feed metals at higher levels than normal, even though all combustion facilities should be trying to minimize metals feedrates. However, because the Agency remains concerned that sources would otherwise continue to feed metals during compliance testing at high levels,[52] to it may be appropriate to consider this extrapolation approach as a means to reduce unnecessary emissions and costs incurred by facilities (and the health risk to testing personnel) during performance tests.

EPA invites comment on this extrapolation approach, and in particular, as to whether the approach is adequately conservative and practicable.

D. Consideration of Site-Specific Variances for Cement Kilns and LWAKs

The Cement Kiln Recycling Coalition (CKRC) has provided comments on the proposed rule suggesting that two variance procedures be incorporated in the final rule: (1) Waiver of the Hg, SVM, LVM, and/or HCl/Cl2 standards when metals or chlorine in minerals and related process materials cause the source to exceed the standard even though the source is demonstrable using MACT control; and (2) waiver of the HC standard for the main stack of a long kiln that does not monitor CO or HC in the by-pass duct when organics desorbed solely from minerals and related process materials cause the source to exceed the standard in the main stack.

[48] This situation would be considered a violation unless the source can document that the exceedance occurred after waste was no longer in the combustor and the residuals of the waste combustion process had been treated by the pollution control equipment.

[49] See USEPA, Draft Technical Support Document for HWC MACT Standards (NODA), Volume III: Evaluation of Metal Emissions Database to Investigate Extrapolation and Interpolation Issues, April 1997.

[50] Extrapolations would be based on applying a conservative ''universal variability factor'' (UVF) multiplier to the test condition average. The UVF is based on evaluating within-test condition emissions variability for each metal in the Agency's trial burn and BIF certification of compliance metal emissions database. It represents (in log form) a ''residual'' level that 95 percent of the residual population is below, where the residual is defined as the difference between the log of the emission level for each test condition run and the log of the test condition average. The UVF would range from 3x to 5x depending on the volatility grouping for the metal. Given the conservatism of the UVF, a less conservative approach would be used (i.e., melding extrapolating using the UVF with extrapolating from the highest run in a test condition) to extrapolate to feedrate and emission levels close to levels actually tested.

[51] Under the extrapolation approach, sources would be required to feed metals at no less than normal rates to narrow the amount of extrapolation sought. Further, we expect that some spiking would be desired to increase confidence in the measured feedrate levels that will be used to project higher allowable feedrates (i.e., the errors associated with sampling and analyzing heterogeneous wastestreams can be minimized by spiking known quantities). However, the Agency does not want sources to extrapolate to allowable feedrates that are significantly higher than their historical range of feedrates (i.e., extrapolated feedrates should be limited close to the historical levels that a source actually fed). This may work to limit the practical utility of extrapolation.

[52] To achieve operational flexibility due to practical testing and compliance restrictions.

CKRC notes that the Conference Report for the Clean Air Amendments of 1990[53] states that:

For categories and subcategories of sources of hazardous air pollutants engaged in mining, extraction, beneficiation, and processing of nonferrous ores, concentrates, minerals, metals, and related process materials, the Administrator shall not consider the substitution of, or other changes in, metal- or mineral-bearing raw materials that are used as feedstocks or materials inputs, * * * in setting emission standards, work practice standards, operating standards or other prohibitions or requirements or limitations under this section for such categories and subcategories.

It should be noted that this language is not reflected in the legislative text, which states without caveat that MACT standards may be based on ''process changes, substitution of materials or other modifications.'' CAA section 112(d)(2)(A).[54] However, assuming that CKRC's request for these variances has merit, and if the variances are incorporated in the final rule, they would apply to LWAKs as well given that LWAK raw materials could also cause those combustors to exceed the standards using MACT control. We solicit comment on whether these variances are appropriate and workable, and on the potential issues raised below.[55]

1. *Variance for metals or chlorine in minerals and related process materials.* It may be appropriate to waive any MACT standard for a metal or group of metals or the standard for HCl/Cl2 if the source documents that it cannot comply with the standard while using MACT control solely because of raw material feed. As examples, MACT control for Hg would be hazardous waste feedrate control at a specified MTEC. MACT control for SVM and LVM would also be feedrate control at a specified MTEC and compliance with the PM standard. A condition of the variance could be that the source would be required to document that the concentration of metal or chlorine (for which it is seeking the variance) in hazardous waste and any non-mineral feedstock is within the range of normal levels for the industry. This would ensure that metals and chlorine emissions attributable to non-mineral feedstreams are equivalent to those from sources meeting MACT.

We therefore request comment on the following issues:

- How would normal levels be determined? What statistics should be used? What should be the baseline year for the determination (e.g., a given year (2000, or the compliance date of the rule)?
- Should the variance be granted only if the hazardous waste and/or non-mineral feedstreams have lower than normal levels of metals or chlorine? How much lower (e.g., 25th percentile levels, 40th percentile levels)?
- Would it be necessary to establish the normal levels in the rule, or should they be established initially, on a case-by-case basis?
- Should the Agency be concerned if levels of metals or chlorine in mineral feedstocks decline over time thus enabling the source to meet the standard? If so, what monitoring approach would be appropriate to identify when that occurred?
- When should variance petitions be submitted to the State or EPA regulatory officials (e.g., 120 or 180 days prior to the compliance date)?

2. *Variance for organics in minerals and related process materials.* Although current BIF regulations limit HC levels in kilns to 20 ppmv irrespective of the source of the hydrocarbons[56] and the Agency proposed to maintain that standard under MACT, CKRC notes that some sources have to operate inefficiently to meet the standard. For example, a source may have to operate back-end temperatures at higher than normal levels to oxidize enough of the organics being desorbed to meet the HC standard. This means that more fuel than normal must be fired to provide the extra heat at the back-end.[57]

CKRC has suggested approaches whereby a source can document that hazardous waste is being burned in compliance with either the CO limit of 100 ppmv or the HC limit of 10 ppmv.[58] In situations where the kiln can monitor a representative sample of combustion gas at mid-kiln at least temporarily during a performance test to document compliance with the CO limit of 100 ppmv (or a HC limit of 10 ppmv), limits on key combustion parameters would be established based on operations during the performance test. The operating limits would be continuously monitored to ensure compliance with the CO or HC limits. Limits on the following operating parameters would be established: kiln gas oxygen at the kiln outlet; kiln gas residence time using raw material feedrate as a surrogate; and combustion zone temperature, using an appropriate surrogate or measured at an appropriate location.

CKRC also suggested that sulfur hexafluoride (SF6) could be used as a continuously monitored compliance parameter in lieu of limits on other parameters, except oxygen. This is because SF6 is recognized as a temperature labile compound—it is more stable than most any other toxic compound under a temperature-failure mode of organics destruction. SF6 is not, however, an indicator of oxygen-deficient combustion failure modes—it is destroyed at high temperatures irrespective of oxygen levels. Given that both adequate temperature and oxygen are necessary for good combustion, an oxygen limit as well as an SF6 feed limit and emission limit would be established under this option based on a performance test documenting compliance with either the CO or HC limits at mid-kiln.

Finally, CKRC suggested variance approaches for the more problematic situation where a kiln is not able to sample kiln gas at mid-kiln for compliance with the CO or HC limit. One approach would be to allow a kiln to document compliance with the CO limit of 100 ppmv or the HC limit of 10 ppmv in the main stack when burning hazardous waste but temporarily feeding imported, low organic raw material. Under this approach, as with the approaches discussed above, operating limits on oxygen levels in kiln gas at the kiln outlet, residence time of combustion gas, and combustion zone temperature would be established based on a performance test using the low organic raw material. Also, continuous monitoring of limits on feedrates and emission rates (based on performance testing) of SF6 could be used in lieu of establishing limits on residence time and temperature.

E. Emissions Averaging for Cement Kilns

Several cement kilns have unique design or operating procedures that warrant special consideration in

[53] H.R. Rep. No. 101–952, at p.339, 101st Cong., 2d Sess. (Oct. 26, 1990).

[54] CKRC cites additional authority in its letter to B. Holloway and F. Behan (USEPA) of March 10, 1997 addressing these issues. Available in RCRA Docket # F–97–CS4A–FFFFF.

[55] To meet its RCRA mandate, the Agency would continue to evaluate emissions under the omnibus permit authority to ensure that controls were adequate to protect human health and the environment.

[56] The Agency has acknowledged that HC in the main stack of a long kiln can be generated by desorption of trace organics in raw material feedstocks as well as from fuel combustion.

[57] Higher back-end temperatures may be associated with higher rates of D/F formation.

[58] Neither approach would appear to be appropriate for kilns that feed hazardous waste at locations other than the clinker end. The concern is that the kiln gas that is withdrawn for testing at the mid-kiln location for compliance with the CO or HC limit may not be representative of hazardous waste combustion gases (i.e., either because the hazardous waste is being fired downstream or, if the waste is fired at mid-kiln, the waste combustion gases may not be thoroughly mixed at the point of kiln gas withdrawal for CO and HC monitoring).

demonstrating compliance with the MACT standards, as discussed below.

1. *Preheater or Preheater/Precalciner Kilns with Dual Stacks.* Some preheater or preheater/precalciner kilns are designed with separate main and alkali by-pass stacks. To demonstrate compliance with the emission standards (other than the CO/HC standards where compliance is based on emissions in either the main or by-pass stack), it is appropriate to allow such kilns to document either that both stacks meet the applicable emission limits, or that the stacks meet the limits considering flow-weighted average emissions. This is the approach currently used for compliance for the PM NSPS, and it is appropriate as well for the MACT standards that the Agency has proposed.

2. *Kilns that operate an in-line raw mill.* Some cement kilns vent the kiln gas through the mill that grinds the raw material (i.e., raw mill) to help dry the raw material before charging to the kiln. Such designs are referred to as ''in-line raw mills''. When the raw mill is out of service for maintenance, approximately 10% of the time annually, kiln gas by-passes the mill and is vented to the stack after passing through the PM control device. (Stored milled raw material is charged during these periods of mill downtime.) The Cement Kiln Recycling Coalition indicates that emissions of HAPs that the Agency proposed to regulate can be different when gas is vented through the raw mill versus periods of time when the mill is out of service.[59]

It appears appropriate to base compliance with the MACT emission standards for such kilns on a time-weighted average basis. Sources would use historical information on utilization time for the in-line raw mill to document the time-weighted average and would present this information to regulatory officials as part of the test plan. Further, sources would be required to conduct performance testing under both operating conditions: with the raw mill on-line and off-line.

III. DRE Testing Considerations

In the NPRM, the Agency proposed that the 99.99 percent destruction and removal efficiency (DRE) standard be retained under RCRA authority. See 61 FR at 17447. Although EPA could have proposed the DRE requirement as part of the MACT standards to help control organic HAPs, the Agency explained that doing so would have raised significant practical implementation concerns. This is because MACT standards are generally self-implemented by facilities to a large degree whereas DRE testing has historically involved a detailed and iterative process between a facility and the regulatory agency.

The Agency received comments that raised other concerns, including: (1) Whether it is necessary for a source to actually perform a DRE test to ensure that it is achieving DRE;[60] and (2) how can the Agency ensure that RCRA DRE testing is coordinated with MACT performance testing.

The Agency has reconsidered DRE testing issues and is today requesting comment on options for ensuring compliance with a DRE standard, and how to coordinate DRE testing with MACT performance testing.

A. Options for Ensuring Compliance with a DRE Standard

The Agency has investigated whether compliance with the CO or HC MACT standards would ensure that a source is achieving 99.99% DRE[61]. The vast preponderance of the data indicate that when a source is achieving CO levels under 100 ppmv or HC levels under 10 ppmv, it is virtually always also achieving 99.99% DRE.[62] The Agency's investigation noted, however, an atypical, failure mode for the CO/HC versus DRE relationship: when low organic content waste is fed into a region of a combustor other than the flame zone (e.g., into an unfired afterburner). One test condition of the approximately 455 investigated failed the CO/HC versus DRE relationship for this reason. This was a highly unusual test condition, and does not represent good combustion practice. CO levels were likely low because flame combustion was not occurring, and HC was likely low because the waste could have had only trace levels of toxic organics that did not contribute significantly to the HC loading (but which could nonetheless pose a health or environmental hazard).

Given the general relationship between CO, HC, and DRE and the highly unusual nature of the lone exception, the Agency is considering whether DRE testing is warranted in all cases for sources complying with the MACT CO and HC standards. The DRE test is a complicated, expensive test. In addition, although it can help indirectly to ensure that a source is operating under good combustion conditions, it may not provide the operationally direct level of assurance of good combustion conditions that CO or HC does. The data show that sources can be achieving 99.99% DRE even though CO or HC levels exceed values considered to represent good combustion (i.e., CO of 100 ppmv, HRA, and HC of 10 ppmv, HRA).[63]

Accordingly, the Agency is considering three options for reducing the DRE testing burden, as discussed below.[64] Under all options where DRE testing would be waived, a source would have to be in compliance with the final MACT standards for CO/HC, which will be sufficient to show ensure compliance with the DRE standard as well.[65]

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[59] CKRC Comments, August 19, 1996, pp 112–113, Docket Number RCSP–0170.

[60] The statutory minimum technology requirement for incinerators (see RCRA 3004(o)(B)) requires the ''attainment'' of 99.99 percent destruction and removal efficiency. DRE testing could be replaced by an alternative that is equally or more stringent (e.g., compliance with stringent limits on CO or HC) to ensure attainment of 99.99 percent DRE.

[61] The Agency evaluated approximately 455 DRE test conditions, where CO was less than 100 ppmv and 273 test conditions where HC was less than 12 ppmv, to determine if compliance with stringent CO and HC limits would ensure that 99.99% DRE was being achieved. Ten sources failed DRE even though CO or HC levels were below 100 ppmv or 12 ppmv (on a run average basis), respectively. Nine of the failures could be explained by: (1) Selecting principal organic hazardous constituents (POHCs) that were also common products of incomplete combustion; (2) feeding low concentrations of POHCs (a phenomenon of DRE testing is that it is very difficult to measure 99.99% DRE when POHCs are fed at low concentrations, even though emission concentrations may be trivial); or (3) feeding aqueous waste with such low concentrations of organics that, even under poor combustion conditions, the waste did not generate high levels of CO or HC. See USEPA, ''Draft Technical Support Document for HWC MACT Standards (NODA), Volume II: Evaluation of CO/HC and DRE Database'', April 1997.

[62] It could be argued that this is due to two factors: (1) during successful DRE testing many sources operated at CO or HC levels that were well below the 100/10 levels; and (2) it is not clear that those sources would continue to achieve 99.99% DRE at higher CO or HC levels (but not exceeding the 100/10 levels). This is unlikely to be a major concern, however, because combustion devices operating at CO levels under 100 ppmv are generally considered to be operating under good combustion conditions that would ensure 99.99% DRE in any event.

[63] Under an option the Agency is considering for establishing MACT standards for CO and HC, a source would be able to elect whether to comply with either the CO or HC standard. Although CO is not a direct measure of HC emissions, the Agency is considering requiring sources that elect to comply with the CO standard to document that their HC emissions also meet the standard.

[64] The Agency's analysis to date has focused on the 99.99% DRE standard. We have not investigated whether sources that burn ''dioxin-listed waste'' under § 264.343(a)(2) and are required to demonstrate 99.9999% DRE are likely to achieve that DRE when operating under stringent CO and HC levels. Given that there are few HWCs that are permitted to manage such wastes and given the high toxicity potential of such wastes, the Agency is inclined to continue to require DRE testing at facilities handling those wastes.

[65] Long cement kilns generally cannot meet the stringent CO and HC limits applicable for waste combustion (i.e., 100/10 ppmv) because of organics in raw materials. Thus, the Agency proposed that

B. DRE As a MACT Versus RCRA Standard

In investigating approaches to ensure coordination of DRE testing with MACT performance testing, the Agency has reconsidered whether the DRE standard could be effectively implemented as a MACT standard (to help control organic HAPs). To ensure coordination of DRE and MACT performance testing, the Agency is considering extending the test plan review period from the proposed 60 day period (see proposed § 63.1208(e) and § 63.7(b)(1)) to one year to allow regulatory officials time to consider DRE testing in context with MACT testing. With this opportunity for coordinating the testing, the Agency's concerns expressed at proposal about the difficulty of implementing the DRE standard under the self-implementing regime of MACT may be largely overcome (i.e., if the Agency incorporates into the MACT standards opportunity to review and approve the DRE test protocol). Thus, the Agency is considering incorporating the DRE standard as a MACT standard.

Sources wishing to perform a combined DRE and comprehensive performance test would have to submit the test plan one year in advance of the test. If the review requires more than one year, the Agency can extend the testing date for coordination purposes (assuming the source has made a good faith effort to cooperate with regulatory officials to identify an appropriate test protocol). However, there would be no extensions granted for the initial comprehensive performance test because it is imperative that sources document compliance with the MACT emission standards (including those for the high priority HAPs, D/F, Hg) on schedule. Sources wishing to perform a combined initial comprehensive performance and DRE test would therefore have to be diligent in working with regulatory officials to ensure that the combined test protocol is developed and approved in a timely manner.[66]

The Agency invites comment on these issues, including whether DRE should be incorporated as a MACT standard, and irrespective of that decision, whether a one-year review period provides adequate opportunity to review a combined DRE test and comprehensive performance test protocol.

IV. Notification and Reporting Requirement Considerations

A. Public and Regulatory Notification of Intent to Comply

In the proposed rule, the Agency requested comment on strategies to encourage or require affected sources to comply with the final emissions standards at the earliest possible date. The Agency also asked for views on methods that could be used to determine when a source could realistically conclude whether it will comply in a timely fashion with the final standards (61 FR at 17416). A number of commenters argued for the Agency to require a submission from affected sources that identifies whether and how the facility intends to comply with the final standards. This notification requirement was referred to as a ''Notification of Intent to Comply.'' The purpose of the submission would be to identify the sources that will not comply with the final standards so that those sources could be forced to terminate waste burning activities as soon as possible following the effective date of the final HWC rule.

Other commenters, responding to our request for comment regarding the proposed permit modification options (61 FR at 17455), suggested that all facilities be required to submit a plan that outlines the procedures each facility intends to follow to comply with the final standards. However, the purpose of this submission would be to begin an early process of communication between the public and the facility through the public disclosure of the facility's compliance strategy.

The Agency has reviewed these comments and supports the goals and purposes of a requirement that compels sources to identify their intentions to comply with the final rule, and to describe how they will achieve that compliance. Furthermore, the Agency supports any process that promotes public notification and interaction with respect to a hazardous waste combustor's future operations. To the extent that some limitations on public participation would be the result of a streamlined permit modification process that may be finalized ahead of the HWC MACT rule, promotion of early public notification and intervention in this part of the rule is appropriate and desirable given our general policies in that regard (see, e.g., RCRA Expanded Public Participation Rule, 60 FR 63417 (Dec. 12, 1995)). Therefore, the Agency is considering a notification requirement, based on and growing out of ideas that were presented in comments, that may be applied to sources affected by the final rule. This notification requirement, called the Public and Regulatory Notification of Intent to Comply (PRNIC), would involve the facility submission and public disclosure of a plan that relates to whether and how the facility intends to come into compliance with the final standards.

However, due to enforcement and implementation issues, the Agency is concerned that it is not feasible to use a submission that identifies only a facility's future ''intentions'' as the legal basis to force a facility to terminate waste burning activities before the statutorily based compliance period of three years. Moreover, any official review and approval of such submissions could conceivably slow down the rate at which facilities come into compliance with the final standards. This would thwart the objectives of a streamlined permit and compliance process.

The Agency believes that the most effective application of such a submission is to promote public awareness, as well as discussion between a facility and its community, which will afford them an opportunity to engage in discussions regarding the details of the facility's plans to comply with the final standards. However, the Agency does not intend for this submission to undergo a formal review by the regulatory agencies involved.

The Agency requests comment on this option which requires sources to prepare and submit for public comment a notification identifying the source's intentions to comply with the final rule as well as the strategy they intend to follow to assure compliance by the compliance date. This notification requirement would apply to all sources

such kilns comply with a CO level of 100 ppmv or a HC level of 20 ppmv. Notwithstanding the inability to document good combustion conditions by complying with stringent CO/HC limits, the Agency believes that cement kilns that fire hazardous waste into the clinker end of the kiln will virtually always achieve 99.99% DRE because, to make marketable products, clinker temperatures must be approximately 2700° F, and combustion gas temperatures are typically several hundred degrees hotter than the solids temperature. These temperatures are theoretically high enough to ensure destruction of organic compounds in the waste. Consequently, such kilns should not be precluded from the waivers discussed in the text. If such a kiln were to inject hazardous waste at nonflame zone locations such as mid-kiln or at the raw material end of the kiln, however, we are concerned that DRE may not always be achieved. The kiln would not be eligible for the DRE waiver.

[66] The Agency also considered requiring sources to submit draft test protocols one year prior to the test date, regardless if the comprehensive performance test is to be combined with a DRE demonstration. We determined that may not be appropriate, however, because normal comprehensive performance tests should not require a review process longer than provided by the CAA-MACT general requirement. Therefore, the one-year test review period would only apply for those sources that wish to coordinate the comprehensive performance (or confirmatory) test with a DRE test.

burning waste on the effective date of the final HWC rule, and would require sources to prepare a draft notification, announce the availability of the draft notification as well as a future informal public meeting to discuss the draft notification, hold an informal public meeting, submit the final notification to all appropriate regulatory agencies, and update the notification as necessary.

The Agency intends for the information contained in the draft notification to provide enough detail so that the public can engage in a meaningful review of the facility's compliance strategy. For example, if in the draft notification a facility identifies and describes the type(s) of control technique(s) being considered, the facility should include, as appropriate, waste minimization and/or pollution control options that may have been evaluated.

EPA also requests comment on a requirement for affected sources to hold at least one informal meeting with the public before submitting the final notification to the appropriate regulatory agencies. The goal of this informal meeting is to provide a forum to facilitate dialogue between the affected source and its community. The meeting should provide an open, flexible and informal occasion for the facility and the public to discuss various aspects of the facility's compliance strategy because it provides the public direct input to the facility owners/operators. In addition, the meeting affords facility owner/operators the opportunity to gain an understanding of the public's expectations, which can then be addressed and included in the facility's final submission. The Agency anticipates that the facility and the public will share ideas, educate each other, and continue to establish a framework for sound communication. However, as suggested in comments received from CKRC,[67] the Agency understands that the early timing of the meeting may affect a facility's ability to have complete or fully accurate information, but the Agency believes that the benefits of early public involvement and access to information outweigh the drawbacks of incomplete information. Furthermore, the time period between the effective date of the HWC rule and the informal meeting announcement should provide a facility sufficient time to collect, analyze, select, and plan a compliance strategy. However, comments are invited on other appropriate time periods between the public notification and the informal public meeting, and on the time period necessary to collect the information required for the PRNIC.

Another timing issue relates to when a facility should notify the community regarding the availability of the draft PRNIC. At this stage, the Agency is considering to require that the notification be made on or before 210 days following the effective date of the final HWC rule. This would necessitate that an announcement of the informal public meeting and the availability of the draft PRNIC be made 30 days prior to the meeting in a manner that is likely to reach all affected members of the community. The Agency is considering that this announcement, of the informal public meeting and draft PRNIC availability, should be required in three ways: As a display advertisement in a newspaper of general circulation; as a clearly marked sign on the facility property; and as a radio broadcast. Each of these notices would have to include the date, time and location of the meeting, a brief description of the purpose, a brief description of the facility, a statement asking people who need special access to notify the facility in advance, and a statement describing how the draft PRNIC can be obtained. The Agency requests comment on this approach that requires facilities to hold an informal public meeting prior to the submission of the final PRNIC to the regulatory authorities.

An additional requirement of the notification approach being considered involves the submission, to the appropriate regulatory agencies, of the final PRNIC 270 days following the effective date of the final HWC rule. The submission would contain the following information: The name and location of the owner operator; the location of the source; a statement as to whether the source is a major or area source; a description of any waste minimization and pollution control technique(s) considered; a description of the emission monitoring technique(s) considered; a description of the waste minimization and pollution control technique(s) effectiveness; a description of the evaluation process used to select the waste minimization and/or pollution control technique(s); and an outline of the key dates in the process that the facility plans to follow to implement the selected waste minimization and/or pollution control technique(s). This submittal should also capture the major comments or ideas that were discussed in the public meeting or that were submitted in response to the release of the draft PRNIC.

The final requirement of the notification approach being considered involves updates to the final PRNIC following a significant change in the facility's implementation strategy. A significant change would be analogous to a change that would trigger a RCRA class two or class three permit modification request, and would apply only to changes that depart from the strategy described in the final PRNIC. Examples of some changes that may be considered significant changes are as follows: A change in the pollution control technique to be implemented; a request for permit modification; a request for an extension of the compliance date; or a decision to stop or to continue burning waste that is contrary to the final PRNIC. Additionally, all sources could be required to notify the public via a mailing to the facility's mailing list within 30 days following a determination that a significant change has occurred in the facility's implementation strategy. The change would have to be described in writing and made available to requesting parties via placement in an information repository or through direct transmittal. This requirement would be in keeping with the spirit of the PRNIC, which is to keep the public informed of any significant changes in the facility's compliance and implementation plan.

The Agency invites comment on this submittal and the submittal process, and requests information on the benefits and burden associated with such a process. The Agency specifically invites comment on the use of permit modification criteria to identify a significant change that would necessitate an update to the PRNIC.

B. Data Compression Allowances

The Agency is considering allowing the use of data compression techniques in the recording of continuously monitored parameters under this rule. This is in response to comments on the proposed rule regarding the additional burden associated with the proposed monitoring and recording requirements and specific requests to allow data compression. We are also considering revisions to parts 264, 265 and 266 that would be conforming revisions to ensure that the RCRA rules are consistent with similar provisions of the proposed part 63 rules.

Commenters raised the issue of an additional burden by the proposed monitoring and recording requirements. We do not agree that the proposed requirements pose significant additional record keeping burdens from current regulations (i.e., BIF rule) or existing

[67] Memorandum, from Craig Campbell (CKRC) to Matthew Hale Jr. (EPA), regarding compliance plans under the HWC MACT Rule, dated March 18, 1997.

permit requirements under RCRA. However, we are interested in reducing the information burden—for example, how much is recorded if the data is automatically evaluated under an established set of specifications, while maintaining the integrity of the data for compliance evaluation purposes.

Briefly, data compression is the process by which a facility automatically evaluates whether a specific data point needs to be recorded. Data compression does not represent a change in the continuous monitoring requirement proposed in rule. One-minute averages will continue to be generated. However, with data compression, each one-minute average will be automatically compared with a set of specifications to decide the need for recording. New data is recorded when the one-minute average value falls outside the set of specifications.

This option should provide a good opportunity to the regulating agencies to focus their review of operating data, because facilities using data compression will record data that is indicative of non-steady state operations more frequently than steady state operations. This will significantly reduce, up to 90%, the data subject to review by the regulating agency as the facilities' self-evaluate, under a previously approved set of specifications, the data being recorded.

The dynamics of monitored parameters are not uniform across the regulated universe, and establishing national specifications for data compression techniques in this rule may not be feasible. Different data compression techniques can be successfully implemented for a monitored parameter to obtain compressed data that reflect the performance on a facility specific basis. As a result the Agency is considering allowing the sources to request the regulatory agency to use data compression techniques that reflect site-specific conditions of the monitored parameters and establish data compression specifications accordingly. Upon approval, sources may start data compression techniques based on the approved set of specification.

At a minimum, a source implementing data compression will be required to record a value once every ten minutes. In combination with the appropriate set of specifications, a recorded value every ten minutes will result in a potential data recording reduction up to 90%.

As a guideline, for the regulating agencies and sources EPA has developed a table to use as a guideline developing site-specific specification for data compression techniques. These are the basis for the specification in the table:

1. *Data compression limit.* The closest level to a permit limit/standard at which reduced recording is allowed. Within this level, minute-by-minute data recording is required. The data compression limit should reflect a level at which the specific parameter is unlikely to exceed its permit limit within a one-minute change. The other consideration is to set a data compression limit at which owners and operators can practically implement data compression.

2. *Fluctuation limits.* The permissible deviation of new data value from previously generated value. This parameter is a reflection of tolerance of the agency to allow a parameter to change without requiring the data point to be recorded. The considerations to establish the fluctuation limits are (1) The potential of the regulated parameter to change in one minute and cause an exceedance of the permit limit on a rolling average basis and; (2) the maximum variation tolerated from a change of other related operating parameters (i.e., fuel and temperature, gas flow and APCD parameters).

We invite comment on allowing data compression under this rule, including revising parts 264, 265 and 266, and on the following table:

FLUCTUATION AND DATA COMPRESSION LIMITS EXPRESSED AS PERCENTAGES OF THE PERMIT/STANDARD LIMITS

Device	Parameter	Fluctuation limit ±	Data compression limit
CEMS	Particulate matter	10%	60%.
CEMS	Carbon monoxide 1 hour	10 ppm	50 ppm.
CEMS	Total hydrocarbon	2 ppm	60%.
CEMS	Total mercury 10 hour	10%	60%.
CEMS	Multi-metal 10 hour	10%	60%.
	HCl	10%	60%.
	Chlorine	10%	60%.
	Max inlet temperature to dry PM APCD	10° F	Limit −30° F.
Activated carbon injection	Min carbon injection feedrate (carbon feed through injector)	5%	Limit +20%.
	Min carrier fluid flowrate or nozzle pressure drop	20%	Limit +25%.
Dioxin inhibitor	Min inhibitor feedrate	10%	60%.
Catalytic oxidizer	Min flue gas temperature at entrance	20° F	Limit +40° F.
	Max flue gas temperature at entrance	20° F	Limit −40° F.
	Maximum waste feedrate	10%	60%.
	Min combustion chamber temperature (exit of each chamber)	20° F	Limit +50° F.
Good combustion and APCD efficiency	Maximum flue gas flowrate or production rate	10%	60%.
Feed control	Maximum total metals feedrate (all streams)	10%	60%.
	Maximum pumpable liquid metals feedrate		
	Maximum total ash feedrate (all streams)	10%	60%.
	Maximum total chlorine feedrate (all streams)	10%	60%.
Wet scrubber	Minimum pressure drop across scrubber	0.5″ water	Limit +2″.
	Min liquid feed press	20%	Limit +25%.
	Minimum liquid pH	0.5 pH unit	Limit + 1 pH unit.
	Min blowdown (liquid flowrate) or max solid content in liquid	5%	Limit +20%.
	Minimum liquid flow to gas flow ratio	10%	Limit +30%.
Ionizing wet scrubber	Minimum pressure drop across scrubber	0.5″ water	Limit +2″ water.
	Minimum liquid feed pressure	20%	Limit +25%.
	Min blowdown (liquid flowrate) or max solid content in liquid	5%	Limit +20%.
	Minimum liquid flow to gas flow ratio	10%	Limit +30%.
	Min power input (kVA: current and voltage)	5%	Limit +20%.
Dry scrubber	Min sorbent feedrate	10%	Limit +30%.

FLUCTUATION AND DATA COMPRESSION LIMITS EXPRESSED AS PERCENTAGES OF THE PERMIT/STANDARD LIMITS—Continued

Device	Parameter	Fluctuation limit ±	Data compression limit
	Minimum carrier fluid flowrate or nozzle pressure drop	10%	Limit +30%.
Fabric filter	Minimum pressure drop across device	1″ water	Limit +2″ water.
ESP	Min power input (kVA: current and voltage)	5%	Limit +20%.

V. Waste Minimization and Pollution Prevention

A. Overview

Amendments to RCRA in 1984, and the Pollution Prevention Act of 1990 establish a clear national policy preference for pollution prevention and environmentally sound recycling as the nation's top priority environmental management methods, over treatment, storage and disposal. Pollution prevention, also referred to as source reduction, includes any practice that reduces the amount of pollutants entering a waste stream, prior to recycling, treatment or disposal. Waste minimization, a term particular to RCRA and EPA's hazardous waste program, includes pollution prevention (or source reduction) and environmentally sound recycling. Combustion for treatment or destruction is a form of treatment, and is not included in the definitions of pollution prevention, source reduction, waste minimization and/or environmentally sound recycling.

Based on previous studies, stringent limits on pollution control devices generally provide a strong incentive for companies to pursue less costly waste minimization measures to achieve compliance. The implementation of the Land Disposal Restrictions program has shown this to be the case in the RCRA program. Waste minimization measures can, in many cases, provide companies with a variety of benefits, including: improvements in production yields, reduced worker exposure, reduced waste volumes, reduced waste management costs, reduced liability, and reduced compliance burdens. As a result, many companies, including those affected by today's rulemaking, have made significant progress identifying and installing waste minimization measures that result in one or more of these benefits. In addition, hazardous waste generators that transport waste off-site for treatment, storage or disposal are required to certify on each hazardous waste manifest that they have a waste minimization program in place. In addition, facilities that have a RCRA permit to treat, store or dispose of hazardous wastes are required to certify annually that they have a waste minimization program in place (See sections 3002(b) and 3005(h) of RCRA).

Past studies indicate that existing regulations can also contain inherent barriers that prevent companies from identifying and installing additional waste minimization measures that could be cost effective and provide an alternative or supplemental means to achieve compliance. Potential regulatory impediments can include: Tight compliance deadlines that preclude taking extra time to explore waste minimization alternatives, perceptions that end-of-pipe technology is preferred by government agencies over less well known waste minimization measures to achieve compliance, a tendency to continue relying on pollution control technology once a company has sunk available capital into end-of-pipe controls, and a lack of government willingness to explore more flexible compliance approaches.

During extensive interaction with public stakeholders during the development of EPA's Hazardous Waste Minimization National Plan (released in 1994), some companies emphasized that short compliance deadlines after the promulgation of end-of-pipe standards are a significant impediment to fully identifying and installing waste minimization measures that could either replace or supplement end-of-pipe pollution control measures that may still be necessary. As a result, companies are likely to opt for installing ''end-of-pipe'' pollution controls to meet compliance deadlines, instead of pursuing waste minimization and pollution control measures as a compliance approach. At large complex manufacturing facilities (such as chemical manufacturing plants), short compliance deadlines are a particular barrier since completing a waste minimization options assessment requires consideration of chemical reaction redesign, testing and installation. In contrast end-of-pipe controls can often be installed more quickly than waste minimization process changes, even though they may be more expensive. In addition, once capital has been sunk into end-of-pipe pollution controls, there is little incentive for companies to then spend money exploring pollution prevention/waste minimization options that would offset the need for the end-of-pipe controls. This factor is one of the major factors to consider in today's rulemaking. This is discussed in more detail below.

B. EPA Proposed Flexible Waste Minimization Incentives

EPA was aware, in its April 1996 proposal for this rulemaking, that promulgating MACT standards may contain some inherent barriers to identifying and installing waste minimization technologies that could be more cost effective for meeting environmental protection standards (in some cases) than end-of-pipe air pollution control equipment alone. Consequently, EPA requested comment on three regulatory incentives that could partially offset potential barriers and provide regulated companies with an increased opportunity to identify and install waste minimization technologies that reduce or eliminate hazardous waste entering combustion feed streams as a cost effective approach to compliance. EPA's objective in this effort is to promote flexibility in the use of waste minimization measures that would reduce the amount and/or toxicity of hazardous wastes entering combustion feed streams, either as an alternative to end-of-pipe combustion measures, or in combination with combustion measures, to meet MACT standards.

EPA requested comment on two approaches that use waste minimization facility planning to identify cost effective waste minimization measures that reduce hazardous wastes entering combustion feed streams. Waste minimization planning has been used in over 20 states as a method to encourage companies, particularly those that generate and manage wastes on site, to identify cost effective waste minimization measures that can be used in place of, or in combination with, end-of-pipe pollution control measures. Of the 21 commercial incinerators and the 141 on-site hazardous waste incinerators facilities known to be covered by today's rule, 43–44 percent of the facilities are in states that have mandatory waste minimization planning programs; 14 percent are in states that have voluntary waste minimization planning programs; and 42–43 percent are in states that do not have formal waste minimization planning programs.

The first waste minimization facility planning approach proposed for comment sought to encourage facilities to reduce the amount of hazardous waste entering combustion feed streams as much as possible through cost effective waste minimization measures. The proposal sought to accomplish this objective by requiring all facilities covered by this rulemaking to provide to the appropriate EPA or State permitting authority adequate information on waste minimization measures that would reduce hazardous wastes entering combustion feed streams. Requiring facilities to formally consider cost effective waste minimization options would raise the likelihood that hazardous waste generation could most cost effectively be reduced at the source or recycled, as a preferred approach to combustion. Since many of these facilities are located in states that have mandatory or voluntary waste minimization planning programs, EPA hoped to build on a process already in place. States that have mandatory waste minimization planning programs generally require facilities to provide a description of changes in process equipment, raw materials, materials handling, recycling, maintenance or other changes that would reduce the amount and/or toxicity of wastes that are treated or disposed. None of the existing mandatory or voluntary State waste minimization planning programs specifically address reductions of combusted hazardous as an objective of the planning process. EPA requested comments on this approach to determine if the approach could provide greater flexibility for facilities to build on requirements of existing state programs to achieve compliance with MACT standards.

In the second waste minimization planning option, EPA proposed to provide EPA Regions and States with the discretionary authority to make case by case determinations regarding which facilities would be required to provide information on waste minimization alternatives to reduce hazardous wastes entering combustion feed streams. This determination could take into account several factors, including, for example, whether an existing state program had already accomplished the equivalent of this objective, the extent to which this requirement may be too burdensome for some states, and the extent to which facility specific conditions indicate emissions could be best controlled by feed stream management and waste minimization at the source.

The third waste minimization incentive EPA proposed for comment allows facilities to apply for up to a one year extension to the three year compliance period allowed under the CAA and 40 CFR 63.6(i)(4)(i)(A) in cases where facilities need additional time to identify and install waste minimization measures that would reduce hazardous wastes entering combustion feed streams as a method (either alone or in combination with combustion or other treatment technology) to achieve compliance. 40 CFR 63.6(i)(6)(i) describes the requirements for requesting a compliance extension. A request must include a description of the pollution control, process changes or process equipment to be installed, a compliance schedule that describes the dates by which these controls, process changes and process equipment will be initiated, the dates by which installation will be completed, and the date by which compliance will be achieved. The Administrator or a State that has an approved Part 70 permit program or has been delegated the authority to implement and enforce the emission standard for that source may grant such extensions. This incentive would, at least in part, offset some of the time barriers large companies might need to fully explore and install waste minimization options in addition to any combustion equipment that may still be necessary.

C. Comments Received

EPA received comments on waste minimization from 22 commenters. Companies that operate on-site units (many of which are large chemical plants) commented that, while waste minimization can provide a cost effective approach to compliance, neither the three year compliance period allowed for this rule, nor the three years plus a one year extension is sufficient time to complete the two track task of designing, testing and installing waste minimization process changes that reduce hazardous wastes entering combustion feed streams, and designing and installing any combustion or other treatment equipment that may nevertheless be necessary. Waste minimization is an on-going process that should be continually under investigation in all companies. However, EPA agrees that in cases where standards are promulgated that change the economics of how much pollution can be emitted to the environment, even on-going waste minimization programs may not be able to anticipate the best combination of waste minimization and treatment measures to achieve compliance. EPA agrees that in some cases, particularly at large complex manufacturing operations, the three year compliance period may not be sufficient time to consider waste minimization measures, and in other cases, three years plus a one year extension may not provide sufficient time.

Commercial facilities continue to assert that they have few direct opportunities to pursue waste minimization since they have little control over the wastes generated by their customers. Some commercial companies believe EPA should implement ‘‘good actor’’ incentives for companies that educate their customers regarding available waste minimization resources. Such incentives could include reduced inspection frequencies, reduced performance testing, and a recognition program. EPA agrees that commercial combustors of hazardous waste have little direct control over the wastes generated by their customers and therefore will experience little if any flexibility from any the waste minimization incentives proposed for comment. The comment to implement good actor incentives as an incentive for commercial companies to educate their customers on waste minimization did not contain sufficient information to determine the merits of such an approach. EPA does point out, however, that this type of concept, i.e., one in which private industry proposes an improvement in environmental performance through and innovative regulatory approach, is the type of approach that might be appropriate for further exploration at a later time.

Three states commented. Two states believe EPA should encourage waste minimization in this rulemaking. However, they believe three years plus a one year extension may not be enough time for companies to identify and install waste minimization measures. The third state said that waste minimization incentives should not be necessary in this rule because companies have had many years to pursue waste minimization programs and should have already considered waste minimization as an approach to compliance. EPA agrees with the two states that, in some cases, three years plus a one year extension may not be sufficient time to identify and install waste minimization measures that achieve compliance. EPA agrees with the third state to a limited extent, in that companies have had many years to implement waste minimization programs, and notes that most, if not all, of the companies affected by today's rulemaking probably have waste minimization programs in place. However, as noted earlier, waste minimization is an on-going process, and the stringent requirements of the MACT standards for hazardous waste burning facilities may shift the economics for particular companies in a way that makes certain waste minimization measures more cost effective than they otherwise would have been, and companies may need additional time to design and install these approaches.

EPA's Interim Final Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program in Place (May 28,1993) recognizes companies make these determinations on a case by case basis. EPA's guidance describes six general program elements that contribute to successful corporate waste minimization programs. These elements include: (1) Top management support that emphasizes waste minimization in its corporate policy, employee involvement and rewards for ideas that reduce waste generation, setting goals for waste reduction, and other proactive management steps; (2) characterization of waste generation and waste management costs, identification of sources of waste in the production process, how they were generated, the value of raw materials and lost products that are escaping as waste, and the cost of replacing and managing wasted materials; (3) periodic waste minimization assessments that are tied into other efforts to improve environmental management; (4) a cost allocation system that assigns the true cost of generating and managing wastes to the activities that generate the waste in the first place; (5) encourage technology transfer that shares ideas and technology between parts of the organization and with other organizations where appropriate; and (6) program implementation and evaluation that evaluates successes and failures, and shares information with the public. While these principles were published in regard to RCRA's waste minimization certification requirement, the principles can be used as relevant guiding principles by companies who wish to consider using waste minimization measures as a method to reduce hazardous wastes entering combustion feed streams regulated under MACT standards and the Clean Air Act.

One company argues in its comments that mandatory waste minimization planning should be made a MACT requirement so that facilities are forced to consider source reduction and recycling alternatives, rather than simply installing end-of-the-pipe equipment to control HAP emissions. The company argues that this approach would be particularly useful in controlling combustion feed streams to limit the combustion of metals and other constituents that can not be adequately controlled using end-of-pipe measures.

EPA has examined this issue closely. While mandatory facility planning on the surface may appear to force facilities to consider waste minimization solutions, providing appropriate regulatory incentives and harnessing the power of public dialogue for companies to identify and install waste minimization measures will result in more waste minimization measures.

Sixteen states have implemented mandatory waste minimization planning programs and several more have implemented voluntary waste minimization planning programs in an effort to encourage facilities to pursue waste minimization measures over end-of-pipe measures. A Federal mandatory and prescriptively detailed waste minimization planning requirement would be, at best, marginally effective in causing large companies (which make up the population of facilities affected by today's regulation) to identify and install waste minimization measures beyond what they would do under current requirements. Large companies generally already have the necessary staff, information, and resources to pursue waste minimization alternatives where it makes sense to do so. Whether large companies choose waste minimization solutions over end-of-pipe solutions depends on a variety of economic and other factors that outweigh attempts to identify additional waste minimization alternatives. EPA hopes to encourage minimizing impediments to waste minimization by soliciting comments on the approaches contained in today's NODA. Furthermore, the remaining States have chosen to not implement mandatory or voluntary waste minimization planning programs. Some States believe that mandatory waste minimization planning does not improve waste minimization results. It would not be appropriate for EPA to either add additional burden to State waste minimization programs that already exist or to States that have chosen not to have waste minimization planning programs.

EPA is, instead, asking for comment on a refined approach that encourages facilities to consider waste minimization alternatives, uses public dialogue to advance waste minimization efforts, and provides regulatory incentives for companies to pursue waste minimization solutions. This approach will achieve many of the same ends more efficiently than a detailed and prescriptive mandatory waste minimization planning requirement.

D. Comments Requested on Additional Waste Minimization Incentives

EPA is requesting comment on a three regulatory incentives that are intended to encourage companies to pursue waste minimization measures to reduce or eliminate hazardous wastes entering combustion feed streams.

The first incentive was proposed in EPA's April 19, 1996 MACT proposal, and is being refined in today's NODA. EPA requested comments on granting regulated facilities the opportunity to request a one year extension to the three compliance period allowed under the Clean Air Act in cases where the additional time is clearly needed to identify and install waste minimization measures that would reduce the amount of hazardous waste combusted as a means of achieving compliance. In today's NODA, EPA is requesting comment on several clarifying factors that will promote consistency while still allowing flexibility in decision-making among the EPA Regions and authorized States who will make determinations on whether or not to grant one year extensions to facilities who apply.

EPA is also requesting comment on extending the agency's current audit and penalty policies to allow some companies to enter into a written consent agreement or consent orders (CA/COs) in cases where it is clear that longer than four years (i.e., longer than a one year extension) is needed to identify and install waste minimization measures that significantly reduce hazardous wastes entering combustion feed streams. These two approaches are discussed more below.

40 CFR 63.6(i) describes the authority, procedures and requirements for requesting a one year compliance extension for meeting MACT standards. Requests must include certain information, including: A description of the pollution control, process changes or process equipment to be installed, a compliance schedule that describes the dates by which these controls, process changes and process equipment, will be initiated, the dates by which installation will be completed, and the date by which compliance will be achieved. Today, EPA is requesting comment on language that clarifies the term ''process changes'' in 40 CFR 63.6(i)(6)(i)(B)

solely with respect to hazardous waste burning incinerators, LWAKs and cement kilns, to make it clear that waste minimization measures are included in the meaning of process changes for meeting MACT standards.

By making this clarification, EPA hopes to encourage the use of waste minimization measures to reduce the amount of hazardous waste entering combustion feed streams as an alternative to or supplement to end-of-pipe emission controls. With respect to hazardous waste burning incinerators, LWAKs and cement kilns, EPA includes in the definition of ''process changes'' the following activities: equipment or technology modifications, reformulation or redesign of products, substitution of raw materials, improvements in work practices, maintenance, inventory control, and environmentally sound recycling measures which reduce the amount and/or toxicity of hazardous waste entering feed streams of combustion devices. The term environmentally sound recycling includes on-site (including closed-loop recycling) and off-site recycling activities that use, reuse or reclaim hazardous materials in accordance with EPA regulations. Burning for energy recovery is not included in the meaning of ''process change'' as a basis for requesting a one year extension for waste minimization purposes. This proposed definition would apply only to hazardous waste burning incinerators, LWAKs and cement kilns.

The Administrator or a State that has an approved part 70 permit program (or has been delegated the authority to implement and enforce the emission standard for that source) may grant extensions under 40 CFR 63.6(i)(9). Under this approach, decisions to grant one year extensions will be made by EPA Regional offices and approved or delegated state programs. EPA recognizes that States employ a variety of approaches for requiring or encouraging the consideration of waste minimization measures in achieving compliance with regulatory requirements. It is not appropriate for EPA to supersede State approaches with a uniform set of criteria for evaluating waste minimization requests for one year compliance extensions. However, EPA believes it is appropriate to encourage (but not mandate) consistency in how these decisions are made. Therefore, EPA is requesting comment on a proposal to include four factors that must, at a minimum be considered by EPA Regional offices and approved or delegated state programs in approving or denying requests for one year compliance extensions for hazardous waste burning incinerators, LWAKs, and cement kilns). These factors include:

- The extent to which the process changes (including waste minimization measures) proposed as a basis for the extension reduce or eliminate hazardous wastes entering combustion feed streams and are technologically and economically feasible.
- Whether the magnitude of the reductions in hazardous wastes entering combustion feed streams through process changes are significant enough to warrant granting an extension.
- A clear demonstration that reductions of hazardous wastes entering combustion feed streams are not shifted as increases in pollutants emitted through other regulated media.
- A demonstration that the design and installation of process changes, which include waste minimization measures, and other measures that are necessary for compliance cannot otherwise be installed within the three year compliance period.

These factors will provide a degree of consistency, while still allowing flexibility among EPA Regional offices and approved States, in the use of this innovative regulatory approach. EPA will also provide separate guidance that provides examples of how to apply the factors to consider and additional information that will be helpful to government and regulated entities. For example, the guidance will provide examples that will help gauge whether the magnitude of proposed requests to reduce hazardous wastes entering combustion feed streams through process changes are significant enough to warrant granting an extension. For example, companies that commit to a 25% or greater reduction in hazardous wastes entering combustion feed streams may be more likely to be considered for an extension than companies that commits to only a five percent reduction.

EPA anticipates that the guidance will contain other examples on how to evaluate cases where a low percentage reduction may actually reflects a significant improvement relative to previous significant waste minimization achievements. The guidance will address how to evaluate shifts from combustion feed streams to other regulated media, such as wastewater effluents or other pollutant sources. EPA anticipates the guidance will address assuring that the proposed process changes that include waste minimization measures are critical path steps toward compliance, and not process improvements that have little to do with reductions of hazardous waste feed streams, and could otherwise have little impact on compliance. Waste minimization measures that are not on a critical path toward compliance or that do not have a direct impact on reducing or eliminating hazardous waste streams entering combustion feed streams are not good candidates for a one year extension. Finally, EPA anticipates the guidance will include a list of states that have approved part 70 permit programs, a list of states that operate waste minimization technical assistance programs, and a list of States that have mandatory or voluntary waste minimization planning programs.

EPA also points out that companies that choose to apply for a one year extension for waste minimization purposes may wish to coordinate the development of compliance extension applications with the development of ''public regulatory notifications of intent to comply,'' contained in today's rule, since much of the developmental work for the two actions should be nearly identical.

In the comments received, several companies and states said that, in some cases, even the three year compliance period plus a one year extension would not be adequate time to design, and install waste minimization measures or additional combustion or treatment measures necessary to ensure compliance with the MACT standards. It may be appropriate, under the circumstances described below, to grant facilities who demonstrate that longer than three years plus a one year extension is necessary to implement waste minimization measures that significantly reduce the amount and/or toxicity of hazardous waste entering combustion feed streams additional time (i.e., longer than four years). Reducing the amount of hazardous waste entering combustion feed streams provides greater long-term levels of protection for public health and the environment than other non-waste minimization/pollution prevention measures that could be used to comply with the MACT standard. Since facilities that need longer than three years or the three year date plus a one year extension to meet compliance are technically in violation (not including facilities that are granted a one year compliance extension and meet compliance within the one year extension period), EPA will require these facilities to enter into written consent agreements/consent orders (CA/COs) to receive this additional time. The process changes that include waste minimization measures must clearly demonstrate the facility will achieve significant reductions in the amount of hazardous wastes entering combustion waste streams over what would have otherwise have been combusted over the long term using combustion-based compliance alternatives installed within the three year compliance period (or three years plus a one year compliance extension). EPA encourages facilities to consider undertaking longer-term waste minimization compliance approaches, subject to limitations proposed today. EPA will consider such requests using its enforcement discretion and the principles articulated in the Agency's ''Policy on Encouraging Self-Policing and Voluntary Correction'' (60 FR 66706, December 22, 1995) (i.e., the ''Audit Policy''). Within this context, EPA may, in certain cases, consider a reduction of penalties for facilities that are able to install compliance solutions that demonstrate significant reductions in hazardous wastes entering combustion feed streams, but need additional time beyond that allowable under the regulations.

To qualify for this special consideration for additional time, a regulated entity would have to submit a written request that contains the information listed below. Facilities must submit requests to the EPA Regional Office that has oversight for their facility within one year after the MACT standards for this rulemaking are promulgated. The request would include:

- An explanation of why the facility cannot reasonably implement their proposed process changes that include waste minimization measures within four years from the date of the promulgation of the MACT standards.
- An explanation of how the facility's proposed process changes (that include waste minimization measures) will achieve greater reductions in quantity and/or toxicity of hazardous wastes entering combustion feed streams. The proposed reductions must be significant. EPA will make these determinations on a case-by-case basis.
- An explanation of how the waste minimization/pollution prevention measures are necessary to achieve compliance with the MACT standards (i.e., waste minimization measures which reduce hazardous wastes entering combustion feedstreams must be shown to have a direct impact on the subsequent design, installation and testing of combustion or other treatment measures necessary to achieve and go beyond compliance standards), and a schedule for implementation of the proposal.
- A waste minimization facility plan. This plan must follow EPA's ''Pollution Prevention Facility Planning Guide'' (May, 1992; NTIS # PB92–213206), or, if the facility is located in a State that requires mandatory waste minimization planning, the form of waste minimization planning required by that State.

Regulated entities must demonstrate a clear intent to achieve compliance in a timely fashion by entering into a consent agreement/compliance order with EPA as soon as they exceed the allotted time provided by the regulations (including any regulatory extension). EPA would then exercise its enforcement discretion to treat a facility's failure to achieve compliance by the regulatory deadline as a violation that can receive penalty mitigation under the Agency's Audit Policy. Under the Audit Policy the Agency may give up to a 100% reduction in the gravity based component of potential penalties. To qualify for eliminating the gravity-based penalty a facility will have to show that it has a compliance management program that meets the criteria for due diligence under the Audit Policy. Otherwise, the facility may qualify for a 75% reduction of the gravity component of the penalty. EPA will provide examples of past cases in the supplemental guidance noted earlier in this section.

EPA realizes that some waste minimization compliance measures may be more cost effective than combustion based approaches. EPA will retain its discretion to recover any economic benefit gained as a result of noncompliance. This will ensure that facilities that delay compliance for a specific period of time do not receive an economic benefit during the period of non-compliance over regulated entities that do comply within the regulatory deadline. For example, EPA may recover the economic benefit a company receives by delaying capital expenditures for modifying their manufacturing process to meet the new compliance standards. EPA may exercise its discretion in appropriate circumstances to choose the lower figure between: (1) the company's pollution prevention/waste minimization expenditures, and (2) expenditures the company would have incurred implementing other methods to come into compliance, when calculating economic benefit during the period of non-compliance with the new regulatory standards. EPA will also use its enforcement discretion to waive recovery of insignificant amounts of any economic benefit resulting from a facility's delayed compliance.

EPA is also encouraging companies to pursue waste minimization measures in an expansion of the provision in the Clean Air Act regulations that requires facilities to submit an early notification that they intend to comply with the MACT standards as they become effective (usually about 2–3 years after the notification is submitted). The expansion, called a public regulatory notifications of intent to comply, would require facilities to include substantially more detail in this notification on: (1) What they have considered doing to meet the MACT standards (particularly with respect to waste minimization); and (2) how they have decided to proceed. This expanded notification would be sent not only to the regulatory agency, but would also be made available to the local community. In addition, the facility would be required to hold an informal meeting with the local citizenry to discuss the notification. However, regulatory agency review and approval of the notification is neither mandated nor expected. This approach would harness the power of public opinion to urge facilities to consider waste minimization alternatives to end-of-pipe ways of meeting the MACT standards. This approach is described in detail elsewhere in today's NODA for public comment.

EPA requests comment on the extent to which the proposed one year compliance extension, the proposed opportunity for companies to enter into consent agreements/consent orders for periods that extend beyond four years, and the PRNIC approach provide companies with appropriate incentives to pursue waste minimization measures to achieve compliance.

VI. Permit Requirements

A. Coordination of RCRA and CAA Permitting Processes

In the NPRM, EPA proposed to place the final MACT standards in 40 CFR Part 63 and reference those standards in 40 CFR Parts 264 and 266 (61 FR at 17451). Under this proposal the standards would only be written out in the CAA regulations, but they would legally be part of both the CAA and RCRA regulations. Thus, both programs would have an obligation to address the standards in permits issued under their authority. EPA proposed this approach to provide the maximum amount of flexibility for state permitting authorities to coordinate the issuance of permits and enforcement activities in a way which most effectively addresses their particular situation.

After reviewing the NPRM comments, there is some question on whether the proposed approach will provide the maximum amount of flexibility to the state permitting authorities. The proposed approach would still require in most cases at least two different permitting authorities to review the air emission standards in a permit. Since under the original proposal the standards would be in both the RCRA and CAA regulations, permit writers from each program might be required to address them to some degree in a permit under that program, either by writing them directly in the permit or by referencing them from the other permit. The proposed approach might not have given states the flexibility to implement the new standards under a single regulatory program. Thus, the proposed approach would result in duplicative permitting actions in many cases.

Commenters had several other concerns with an approach where the air emission standards are incorporated into two permits. One major problem described by commenters is that the overlapping permit conditions of the Title V and RCRA permits would be subject to two separate permit modification procedures, administrative appeals procedures, and potentially separate judicial procedures as well. The Agency now believes that this outcome could be needlessly duplicative and unwieldy, and therefore not consistent with the Agency's intent to simplify permitting.

Additionally, commenters were concerned that the proposed approach would have allowed for dual enforcement scenarios where enforcement actions under both statutes would be brought against the facility for a single violation. In the NPRM, EPA stated that the Agency did not expect to enforce under both permits (61 FR at 17452). However, commenters noted that this statement did not restrain the states from initiating dual enforcement actions, or citizens from initiating dual citizen suits.

Codifying the MACT standards in only one place in the regulations (unlike the proposed scheme) may actually provide states the greatest flexibility in the way they issue permits and prevent duplication of effort. Although the standards would be codified under one statute, states could decide which program they want implementing the standards. A state would be free to decide, for example, to have its RCRA staff implement a set of CAA standards. Another approach would be for a state to decide under which state statute to adopt the MACT standards based on which part of their program they wish to implement the standards. For example if EPA places the MACT standards in part 63 only (see below), a state could still decide to adopt those standards under their state solid waste statute and implement the standards through their RCRA hazardous waste program, depending on how their state solid waste statute is written. The basic premise in this approach is that it is not significant to EPA, nor to proper implementation of RCRA or CAA, under what statute a state adopts a RCRA or CAA regulation.

EPA particularly would like to take comment on this issue. Do states believe they can decide under which program to implement the MACT standards if they are only placed in Part 63? EPA is concerned that states be allowed to implement the standards through either their CAA or their RCRA program, whichever works best for their particular situation.

Currently, EPA is considering placing the MACT standards only in 40 CFR part 63 and relying on the air program implementation scheme, including the Title V permitting program, to bring facilities into compliance with the new standards. This approach (as opposed to the converse—placing the standards only in the RCRA regulations) is the only approach that appears feasible to allow the standards to be codified in only one place in the regulations. The Agency would rely on the integration provision of RCRA section 1006(b)(1) to defer RCRA controls on these air emissions to the part 63 MACT standards. (The CAA does not have a similar integration provision which would allow deferral of CAA requirements to RCRA regulations.)

We emphasize, however, that under this approach, there would still be a need for a RCRA permit at HWC facilities, to address any other RCRA units on site, and to address RCRA regulations which apply to all types of RCRA facilities and which are not duplicated under CAA. For example, a permit will be required to address hazardous waste storage units that hold the waste prior to combustion. As with all RCRA permits, the permit would require compliance with the standards in 40 CFR part 264 (including general facility standards, preparedness and prevention requirements, contingency planning and emergency procedure requirements, manifesting requirements, recordkeeping and reporting requirements, releases from solid waste management units requirements, closure and post-closure requirements, financial requirements, corrective action requirements, storage requirements, materials handling requirements, and air emissions standards for process vents, equipment leaks, tanks, and containers). The omnibus provision of RCRA Section 3005(c)(3), codified at § 270.32(b)(2), which provides for additional permit conditions as necessary at a particular site to protect human health and the environment, would also need to be addressed in the RCRA permit, with respect to the combustor and other activities at the facility. (This issue is discussed further in the next section.) Among other consequences, this means that the current program of processing RCRA HWC permits will continue until EPA finalizes any program changes. It remains a high priority to bring all HWC under full Part B permits as soon as possible.

Although the RCRA permit would not need to duplicate the MACT controls contained in a Title V permit, there will typically be a number of waste management activities associated with the combustion unit that would need to be addressed in the RCRA permit (and not the Title V permit), such as materials handling (feed and residues) and combustor-specific (but not MACT-related) waste analysis requirements and feed restrictions. If, as under the original proposal, the Agency decides to retain the DRE standard in the RCRA regulations, then DRE would also need to be addressed in the RCRA permit.

The discussion above describes one approach the Agency is considering for the final rule. If this approach were adopted, it would establish how EPA would implement the new MACT standards where the Agency has permitting jurisdiction. However, in many cases, states are delegated RCRA and CAA authority. It would therefore be up to the state program to decide how best to implement the MACT standards given the particular authorities of the state. The approach described today may be better suited to provide greater flexibility for state approaches, whether the State prefers to rely primarily on the MACT and Title V permit process or the RCRA permit process to impose the new standards.

The Agency recognizes that in many cases facilities will already have a RCRA permit in place when the MACT standards become effective. This situation raises the question of what happens to RCRA permit conditions related to combustor air emissions.

From an overall standpoint, it is expected that the MACT standards will be more stringent than many current RCRA regulations and permit conditions. However, at some individual sites, certain RCRA permit conditions may be more stringent than the corresponding MACT emissions standards. Some potential reasons why such a situation would occur are because the RCRA permit condition is based on a site-specific risk evaluation under the BIF rule or the omnibus provision; because the MACT standard is in a different format than the permit condition (e.g., a mass emission rate or removal efficiency format in a RCRA permit vs. a concentration-based standard for HCl under MACT) and at that particular site the RCRA format yields more stringent control; because, in the case of CO limits in early incinerator permits, the RCRA permit limit was based on levels during the trial burn; or because the facility was one of the lower emitters in the standards development MACT pool.

The Agency's overall intent is for the MACT standards to replace the RCRA air emissions standards for hazardous waste combustors. Therefore, where the Agency has permitting jurisdiction, the RCRA air emissions permit limits for HWCs, with the exception of site-specific risk-based limits, would be deleted from RCRA permits when the MACT standards become operational. In the case of site-specific risk-based limits, based either on the BIF metals and HCl/Cl2 requirements or omnibus authority, these limits would remain in RCRA permits to satisfy the protectiveness requirement of RCRA section 3004 (a) and (q). As with EPA issued permits, in authorized states any site-specific risk-based limits would need to be retained where necessary to satisfy RCRA protectiveness requirements. Since authorized states are allowed to be more stringent, states will determine, in the process of deciding whether to delete old RCRA-based regulations and in the permitting process, whether to keep or delete more stringent permit conditions which are not based on a site-specific risk finding.

EPA would like to take comment on the approach of placing the MACT standards only in the part 63 regulations, and deferring the RCRA standards, as described above.

B. Permit Process Issues

As discussed above, the Agency is considering an approach of placing the MACT standards only in 40 CFR part 63 and using RCRA 1006(b) authority to defer RCRA permitting to the Title V permitting program for the air emission standards only. This approach raises the issues of how and when the permitting authorities should modify existing RCRA permits to remove the air emission standards. The Agency's current thinking is that the RCRA permit should continue to apply until a facility completes its comprehensive performance testing and its Title V permit is issued (or its existing Title V permit is modified to include the MACT standards). The RCRA permit would then be modified to remove the air emission limitations which are covered in the Title V permit. Another option is to modify the RCRA permit at the time the facility submits their comprehensive performance test results. However, it is beneficial to wait until the test results are reviewed, approved, and written into a Title V permit before deleting any RCRA permit conditions because of the greater level of Agency and public review that occurs during the permit process. The Agency would like to take comment on this issue. At what point should the RCRA permit be modified to remove air emission standards? How should the switch-over to the new permitting system occur? Note that irrespective of when the Title V permit is issued/modified, the MACT standards and associated operating limits become enforceable according to the schedule in the final rule.

After the compliance date for the final rule, but before the RCRA permit is modified to remove any air emission limitations, there will be a period where a facility will have both a RCRA permit that addresses air emissions and either: (1) A precertification of compliance document with applicable operating conditions that they have submitted; or (2) a Title V permit which also addresses air emissions. Note, the RCRA permit will continue to apply until such time that it is modified to remove any air emission limitations. The precertification of compliance document or Title V permit will not automatically supersede RCRA permit conditions as a matter of law. The more stringent conditions will govern.

C. Omnibus and RCRA/CAA Testing Coordination

As discussed in the preamble to the proposed rule (61 FR at 17371), EPA currently has a national RCRA policy of strongly recommending to all federal and state RCRA permit writers that, under the omnibus provision of RCRA section 3005(c)(3), site-specific risk assessments (SSRAs) generally be performed as part of the RCRA permitting process to determine whether additional conditions are necessary to protect human health and the environment. The results of these risk assessments are then used to set protective permit conditions. Under the new permitting scheme that the Agency is considering (placing the MACT standards only in 40 CFR part 63), the Agency is considering when the RCRA omnibus provision would continue to be used—for example, to require a site-specific risk assessment—and the timing of the RCRA omnibus finding in relation to the Title V permit issuance/modification.

As discussed in the NPRM, the Agency has indicated a preference for modifying our current policy of recommending that a site-specific risk assessment (SSRA) be performed during permitting at hazardous waste combustors in most cases (61 FR at 17372). Depending on the scope and level of the final MACT standards, this policy may need to be re-evaluated. For at least some facilities, there might still be sufficient cause to perform a SSRA under the RCRA omnibus permitting authority.

Thus, the Agency is also considering the timing issue of whether a RCRA omnibus finding would be expected to occur at the same time as the Title V permitting decision (or the Title V permitting modification decision, if this is more appropriate, since some of these units will most likely already have Title V permits). The Agency expects that many of the trial burns to support SSRAs will already be completed prior to the effective date of the MACT rule, and would not need to be repeated provided none of the resulting emissions limitations are relaxed based on the MACT rule. For facilities where trial burns for risk assessments have not been performed, a RCRA omnibus determination as to whether a SSRA is needed can be made in most cases before the comprehensive test protocol is finalized. This situation would allow the MACT comprehensive test protocol and RCRA trial burn plan to be coordinated with respect to sampling and analysis procedures and operational protocols. However, the Agency does not plan to hold up comprehensive performance test approval or the Title V permit process (modified or new permits) to accommodate a RCRA omnibus finding.

If it were not possible to make the RCRA omnibus determination in sufficient time to allow coordinated emissions testing, then a separate RCRA trial burn might be necessary. This separate test event would increase the costs to the facility and require more oversight by the permitting authority. After allowing for additional time to perform a SSRA, the findings of the risk assessment could then be used to establish site-specific standards which, in turn, might require a review of the Title V permit and its associated operating limits/standards.

It should also be noted that if the DRE standard is retained under RCRA (see discussion in Section III.A.), these same testing coordination issues apply to DRE testing. (At sites where SSRAs are to be performed, it is expected that DRE testing and testing necessary to provide data for SSRAs will be occurring at the same time.)

We invite comment on the workability of this approach for achieving maximal coordination of the RCRA trial burns and omnibus findings with the initial MACT comprehensive test and Title V permitting.

Part Four: Miscellaneous Issues

I. 5000 Btu per Pound Policy for Kiln Products

Current Agency policy exempts cement product (clinker) from cement kilns burning hazardous waste from regulation as a hazardous waste provided the fuel value of the hazardous waste exceeds 5000 Btu per pound [68]. This allows cement kilns to burn high-Btu hazardous waste for energy recovery purposes and still market the clinker and the cement mix produced from the clinker as commercial product free from any Subtitle C concerns. The Agency has already provided a clarification (53 FR 31198, August 17, 1988) that the regulations for ''waste derived products'' at § 266.20 do not apply to products from processes using hazardous waste (HW) fuels, unless these processes also use hazardous wastes as ''ingredients'' in a product destined for land application (i.e., the product must ''contain'' the HW as an ingredient to be covered by § 266.20) or burn hazardous waste for destruction. To implement this regulation, the Agency has used Btu values of a waste as a proxy to determine whether contaminants in the HW fuels will or will not be deemed to transfer to the product (i.e., become ingredients). Over time, many commenters have submitted data and have suggested that the heat content of a waste is an indirect and imprecise way of identifying whether materials should be subject to the provisions of § 266.20 (hazardous wastes used in a manner constituting disposal).

The Agency has been interested for some time in considering whether and how to change the existing Btu approach. For example, 60 FR 7376 (February 7, 1995) discusses a possible exclusion of clinker from the derived-from rule, even when cement kiln dust is introduced in the feed. EPA has also discussed with CKRC the narrower issue of whether the 5000 Btu/lb energy value level reliably predicts whether toxic contaminants would more likely partition to the clinker and ultimately the cement product. Some from industry have suggested that a facility that agrees to limit waste feed metals to their ''historic average'' could be exempted from the 5000 Btu/hr policy. The rationale is that even if the facility took lower Btu waste, they would not be taking higher quantities of metal waste than currently, at least on the average. This would address EPA's concern about allowing an increase of metals in HW fuels burned by cement kilns if the 5000 Btu restriction were abandoned.

Today, without our endorsement at this time, the Agency is offering this concept and some potential variations for public comment. The Agency is interested in the possible ramifications and requests comment, particularly with respect to limiting the concentrations of metals in cement products from cement kilns burning hazardous waste. To take advantage of such a policy, a facility would have to establish a baseline of metals feed in the hazardous waste (for example, the average of the previous three years) and then agree to enforceable permit conditions limiting metals feedrate levels to that average plus one standard deviation. Presumably, enforceable restrictions on metal feed rates should control metal partitioning to clinker and CKD much more effectively than would the Btu limit and ensure that these materials would not contain an increase in toxic metal constituents from the hazardous waste used as fuel. Also, metal feed limits based on a historical average would appear to be more stringent than the current BIF metal feed limits, which are set on a health basis considering direct inhalation of metals emissions. (In other words, as discussed in earlier sections of this notice, cement kilns are generally feeding metals far below allowable BIF limits.)

EPA seeks comment on allowing cement kilns (and LWAKs) the option of complying with the following, which is only partly based on the suggestions discussed with cement kiln representatives, with some additions:

- An owner or operator of a cement kiln burning hazardous waste would be allowed to burn hazardous waste with any Btu content, provided the owner or operator agrees to enforceable hazardous waste feed operating limits on metals of concern (see below);
- These metals feed limits would be set at levels that would ensure, at least on an annual basis, that metals on a mass basis do not increase over current levels, which are substantially less than those allowable under BIF (and sources would, of course, remain subject to stack emission standards to control the emission of metal HAPs);
- Feed limits would have to be established for each of the following twelve metals: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, thallium, and vanadium;
- Sampling and analysis would be conducted as often as necessary to document that the metals levels are below the limits and included in the facility's waste analysis plan required by 40 CFR 264.13; and
- Results of the analysis would have to be available for public inspection.

Also, the Agency is considering a variation of this option, under which kiln operators would have to achieve specified percentage reductions of the total quantity (on an aggregate basis) of the following metals in their wastes combusted: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, thallium, and vanadium. EPA chose these particular metals based on their potentially high human health and ecological risk in conjunction with their significant tendencies to persist in the environment and accumulate in living tissue. If generators reduce metals in wastes over time, holding kilns to the average of the past three years may actually allow increased burning of certain metal-bearing streams. This is because other streams may contain less metals. In contrast, commitments to reducing metals below baseline limits would ensure that progress continues in waste minimization. EPA requests comments on this option, including information about: (1) The prevalence and distribution throughout industry sectors of waste streams bearing these metals sent to combustion, and (2) opportunities for generators to reduce these metals in wastes sent to combustion by means of source reduction during generation.

EPA requests comment on the impact of imposing limits on metals concentration on waste streams combusted in cement kilns. EPA raises these questions:

- How much hazardous waste now sent to cement kilns for energy recovery would be likely to meet such metal level limitations?
- Of the fraction of wastes that would ''fail'' a metals limit, would generators of waste now sent to cement kilns reduce metals concentrations in these wastes, using waste minimization and pollution prevention, so that cement

[68] Wastes with energy value greater than 5000 Btu may generally be said to be burned for energy recovery, since this is the Btu value of low grade fuels. 48 FR 11157–59 (March 16, 1983). However, lower energy wastes could conceivably be burned for energy recovery in industrial furnaces, such as cement kilns, or in industrial boilers due to these devices' general efficiency of combustion. Id. At 11158. Thus, the 5000 Btu level is not an absolute measure of burning for energy recovery (i.e., a rule), particularly when industrial furnaces and industrial boilers are involved.

kilns would continue to receive the same amounts of waste?

- If no such action to reduce metals concentrations occurred, would cement kilns reject high-metals hazardous wastes now sent to cement kilns for energy recovery and would these wastes go instead to incinerators?

The Agency also requests comment on the related issue of appropriate metals reduction goals. EPA has identified a national goal for waste minimization of the most persistent, bioaccumulative and toxic hazardous constituents by 25 percent by the year 2000 and by 50 percent by the year 2005. See EPA's Waste Minimization National Plan (Office of Solid Waste, November 1994). Consistent with this national waste reduction goal for metals, EPA requests public comments today on requiring *aggregate percentage reductions* for the twelve metals in waste feed, as an alternative to holding cement kilns to the historical average feed limits of the past three years and allowing no increases over baseline limits. This approach would also further waste minimization planning by offering kilns a reason to motivate the generators supplying them with hazardous waste for combustion to undertake waste minimization. In comments related to the role of waste minimization in the MACT proposal, Molten Metal Technologies (MMT) states that ''without drivers favoring pollution prevention and waste minimization in the instant rulemaking, only minimal progress will be made.'' MMT points out that economics conspire against pollution prevention and waste minimization since investment for compliance often takes priority over investment for process modifications to reduce waste generation and since corporate rate-of-return thresholds may ''squash'' pollution prevention and waste minimization initiatives.

Finally, the Agency requests comment on whether additional nonmetal constituents (e.g., chlorinated organics) should also be identified for similar reductions as part of this approach.

II. Foundry Sand Thermal Reclamation Units

A. Background

Foundry operations can generally be classified as either ferrous or nonferrous, depending on their primary feed materials. Both types of foundries use large amounts of sands for their metal molds. Over time, the sands become contaminated with the metals being used, as well as with certain binder materials. Nonferrous foundries (i.e., brass, lead, etc.) sometimes generate spent sands that exhibit the Toxicity Characteristic (40 CFR 261.24) for lead or cadmium. (The Agency has indicated concerns with certain sand treatment methods. See 62 FR 10004, March 5, 1997.) These sands can be physically processed to remove contaminants for continued use, resulting in less sand use for the foundry, and less need for disposal of the sands. Interest has also been expressed in using thermal processing or reclamation units (TRUs) to clean the sand for continued use. TRUs may represent a significant waste minimization technology for the foundry industry.

The TRUs remove contaminants primarily by combusting the organic binder materials in the sand. These organic materials are generally wax-like materials, synthetic or natural (e.g., clays, phenols, etc.). Air emissions concerns would include lead, cadmium, and particulate emissions, as well as products of incomplete combustion. These units are identified as industrial furnaces under 40 CFR 260.10 as a type of ''foundry furnace'' and are subject to regulation under 40 CFR part 266, subpart E (the ''BIF rules'') when they burn hazardous waste.[69] When the Agency developed subpart E, however, we did not consider whether TRUs would be appropriately controlled under those standards. The Agency created a special exemption for metal recovery furnaces under § 266.100(c) and also proposed a special exemption for petroleum catalyst recovery units (see 60 FR 57780; November 20, 1995). In these two cases, we found that the BIF rules would not appropriately control the units in question, i.e., any air emissions hazards might be more appropriately controlled under standards specially designed for those units under either RCRA or CAA. Under RCRA Section 1006, an important consideration for the Agency is to avoid duplication to the extent practical between the two Acts. Also, as noted above, TRUs may achieve significant waste minimization benefits, an important consideration under RCRA.

[69] Another potential reading of the Section 260.10 definition is that ''foundry furnaces'' only applies to a furnace that burns a primarily metal-bearing material. Under this reading, TRUs could not be industrial furnaces because they burn sand with only contaminant levels of metals. However, since TRUs are closely associated, both physically and functionally, with the primary metal processing functions of a foundry, they are appropriately classified as industrial furnaces subject to part 266, subpart E.

B. Deferral and Variance Options for Consideration

The Agency is presently developing MACT controls under the CAA for foundries. Although at this time it is not clear to what extent TRUs would be subject to MACT controls, representatives from the foundry industry have suggested that, as the new MACT rules are implemented, all foundries with TRUs will be required, as a practical matter, to install MACT controls on the TRUs. Among the reasons cited are that vendors of TRU technology will have to design for situations under MACT control, and state air officials will incorporate the MACT technology in permits for foundries as a matter of course.

Although EPA has no way to predict whether this scenario would come to pass, there are obvious advantages to controlling TRUs processing sands that exhibit the TC under MACT standards, as opposed to under the BIF rules. These advantages include administrative simplicity and maximum flexibility for implementing agencies. EPA requests comment on the following two approaches to ensure appropriate controls for TRUs:

1. *Deferral option.* Given the developments under the CAA discussed above, and also in light of the potential waste minimization benefits, EPA requests comments on appropriate control schemes for TRUs burning hazardous foundry sands. Specifically, comments are requested on a deferral of BIF applicability, similar to the existing provision for metal recovery furnaces and proposed provision for petroleum catalyst recovery units. This would allow development of the foundry MACT, and potentially the eventual application of these controls to TRUs processing sands that exhibit the TC. Under such an approach, EPA would place an exemption in Part 266, Subpart E, identifying foundry TRUs as an exempt BIF, and a one-time notice would be required as is now required for metal recovery furnaces under § 266.100(c)(1)(I).

2. *Variance from definition of solid waste option.* TRUs appear to be integral to foundry operations. They are located at the foundry site, operated by the foundry, and the sand being processed and returned to the foundry operation is essential in the manufacturing operation. The time periods between when a spent sand is generated and when it is processed and returned is typically a matter of hours. In fact, TRUs may reduce the need to store spent sands for processing and may thereby reduce fugitive emissions of the sands

that might result from physical processing. Given that a sand appears integral to foundry operations and TRUs can greatly improve the efficiency of sand use, EPA could conclude that even without any rule changes, foundry operators may be eligible for a variance from the RCRA definition of solid waste under the variance provisions found at 40 CFR 260.30(b), 260.31(b), and 260.33.

Under these variance provisions, EPA (or an authorized State) may grant a variance from the definition of solid waste for materials that are reclaimed and then used as feedstock within the original production process in which the materials were generated if the reclamation process is an essential part of the production process. This evaluation is guided by a number of criteria found at § 260.31(b). While foundries certainly can and do operate without thermally processing their sands, and so TRUs are not literally ''essential'', as summarized above the units do in fact greatly increase efficiency of sand use, which is an essential raw material of foundry operations. Also, the TRUs are physically proximate, and integrated into the foundry's operations. Emissions from the TRUs are often ducted into emission control devices used for the foundries' main production activities. As such, the Agency could view sands being processed in TRUs as potentially eligible for the variance under 260.31(b)[70]. EPA (or the State) would still have to weigh the factors in paragraph (b) on a case-by-case basis to determine if the variance should be granted. For example, paragraph (b)(3) requires an examination of how the sands are handled to ensure that losses are minimized before reclamation. Also, paragraph (b)(8) allows consideration of ''other factors'' as appropriate, and in this case, air emissions controls for the TRU would be appropriately considered before granting a variance. As discussed above, controls may be installed as part of the MACT process, or simply due to state or local air pollution laws. The Agency would expect that as a minimum, emissions of particulate matter would have to be limited to control lead emissions, and given the organic binder compounds being introduced to the units, limits on and continuous monitoring of indicators of efficient combustion, such as CO and/or HC, would seem appropriate. Under this approach, the Agency might or might not develop special standards for TRUs under RCRA or the CAA. The case-by-case approach might enable EPA and the States to oversee the units without the need for federal standards.

III. Status of Gaseous Fuels Generated From Hazardous Waste Management Activities

The proposed rule included a proposed exclusion from subtitle C jurisdiction for certain synthetic gas fuels derived from hazardous waste treatment activities (61 FR at 17465). Some commenters stated that synthesis gas fuels are beyond EPA's regulatory authority because they are uncontained gases, and further stated that EPA had failed to set out any explanation for its potential jurisdiction over these synthesis gas fuels (which jurisdiction EPA proposed to relinquish provided the syngas met designated specifications).

The type of syngas discussed in the proposal results from thermal reaction of hazardous wastes, which reaction is optimized to break organic bonds and reformulate the organics into hydrogen gas and carbon monoxide. *Id.* This resulting gas can be used as a fuel at manufacturing facilities.

EPA has broad statutory authority to regulate fuels produced from hazardous wastes. RCRA section 3004(q)(1); see also *Horsehead Resource Development Co.* v. *Browner,* 16 F. 3d 1246, 1262 (D.C. Cir. 1994) (broadly construing this authority). The fact that syngas (by definition) is a gas, rather than a solid or liquid, does not appear to raise jurisdictional issues. It is still produced from the hazardous wastes that are being processed thermally. See § 261.2(c)(2)(A) and (B) (defining such materials as solid wastes). EPA believes its authority to be clear under these provisions, but will consider further comment on the issue.[71]

IV. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA) of 1980 requires Federal agencies to consider impacts on ''small entities'' throughout the regulatory process. Section 603 of the RFA calls for an initial screening analysis to be performed to determine whether small entities will be adversely affected by the regulation. If affected small entities are identified, regulatory alternatives must be considered to mitigate the potential impacts. Small entities, as described in the Act, are only those ''businesses, organizations and governmental jurisdictions subject to regulation.''

In preparation of the proposed rule, EPA used information from Dunn & Bradstreet, the American Business Directory and other sources to identify small businesses. Based on the number of employees and annual sales information, EPA identified 13 firms which may be small entities. That analysis also determined that the proposed rule was unlikely to result in detrimental impacts to small businesses. This conclusion was derived from two important findings:

First, few combustion units are owned by businesses that meet the SBA definition. Among those that are considered small (based on number of employees), over one-third were found to have gross sales in excess of $50 million per year. Furthermore, available data indicate an ongoing industry trend toward consolidation, or market exit.

Second, small entities impacted by the rule, were found to be those that currently burn very little hazardous waste, and hence face very high cost per ton burned. These on-site facilities are likely to discontinue burning hazardous waste and dispose off-site, rather than comply with the proposed rule. Based on available data, EPA found that the incremental cost of alternative disposal associated with discontinued burning of such waste would not exceed 0.10 to 0.20 percent of annual corporate gross revenues. Furthermore, currently viable commercial small business facilities affected by the proposal were found to remain profitable.

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[70] The Agency notes that, typically, a variance from the definition of solid waste under 260.31(b) would apply at the point of generation (e.g., in this case, the point where the spent sands are removed from the casting forms). Also, typically, when such a variance is granted, the variance is only applicable to those secondary materials that meet the conditions of the variance (e.g., the variance would not include secondary materials that are not reused in the production process).

The normal and efficient flow of materials at facilities with a TRU may involve the processing of all of the spent sand generated. However, after recovery of the sand, insubstantial amounts of sands that are processed by the TRU may be found to be unusable again as foundry sand, and so may be discarded. While treatment and disposal of the spent foundry sand is clearly not the intent of the TRU, ''treatment and disposal'' would be the regulatory status of any hazardous secondary material that is processed such that it is no longer hazardous and then discarded, given the most straightforward reading of the regulations.

Nevertheless, the Agency believes that because the TRU is typically integrated into the facility's operations, and the flow of spent foundry sand into the TRU becomes a standard operating procedure, the incidental discard of an insubstantial amount of spent foundry sand should not overshadow the basic purpose of § 260.31(b) to grant a variance from the definition of solid waste to materials that are reclaimed and reused in the production process, where such reclamation is, in effect, an integral step in the flow of production. Thus, the Agency asserts that, assuming all other conditions of the § 260.31(b) variance are met, the fact that a relatively insignificant amount of spent foundry sand is discarded would not negate a variance granted to spent foundry sand, or require a treatment permit for the TRU.

[71] See also 50 FR 49164, 49171 (Nov. 25, 1985); 52 FR 16982, 17021 (May 6, 1987); and 56 FR 7134, 7203–04 (Feb. 21, 1991) which discuss this question, although inconclusively.

The above findings indicate that the proposed rule is expected to have overall negligible impacts on small entities. The Agency is currently refining and expanding its analysis of small entities and makes no conclusions beyond those presented for the Proposal.

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Elizabeth Cotsworth,

Acting Director, Office of Solid Waste.

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