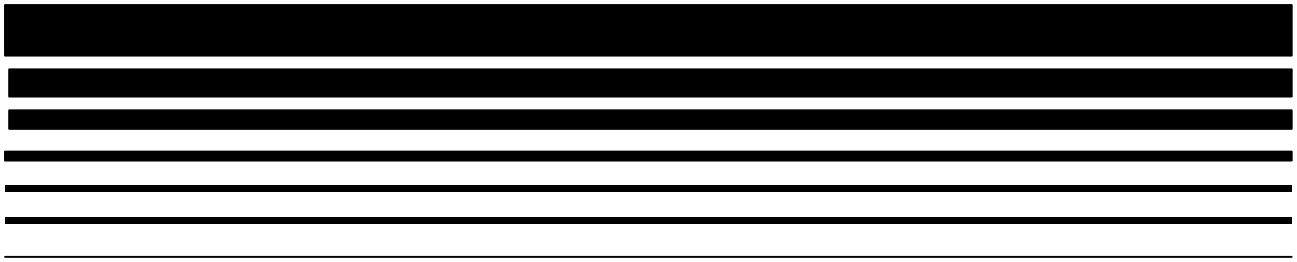
United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park NC 27711

Air

EPA

National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing-- Background Information Document for Promulgated Standards



NESHAP

EPA-453/R-03-005
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National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing-- Background Information Document for Promulgated Standards

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Emission Standards Division
Research Triangle Park, North Carolina 27711

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1.0 INTRODUCTION

On November 21, 2001, the Environmental Protection Agency (EPA) proposed regulations (40 CFR part 63, subpart LLLLL) in the Federal Register (66 FR 58610) to establish National Emission Standards for Hazardous Air Pollutants (NESHAP) for new and existing asphalt processing and asphalt roofing manufacturing facilities. Also, on June 12, 2002, EPA distributed a letter commenters with asphalt processing facilities to clarify that the proposed NESHAP would apply to all asphalt processing operations regardless asphalt's end use. This letter invited comment on this clarification of rule applicability.

This document contains summaries of the public comments that EPA received on the proposed standards and subsequent applicability clarification and EPA's responses to those comments. This summary of comments and responses serves as a basis for revisions made to the NESHAP between proposal and promulgation. The EPA received 21 comment letters in response to the proposed asphalt processing and asphalt roofing manufacturing NESHAP (asphalt NESHAP). The commenters are listed in the following table.

TABLE 1. DOCKET A-95-32
CATEGORY IV-D

Item Number	Commenter and Affiliation
IV-D-01	Linda Tanner 3M Environmental and Technology Services St. Paul, MN
IV-D-02	Mark W. Hibbs Barr Engineering Company Minneapolis, MN

TABLE 1. DOCKET A-95-32
CATEGORY IV-D

Item Number	Commenter and Affiliation
IV-D-03	Kent J. Vernon Marathon Ashland Petroleum LLC Findlay, OH
IV-D-04	Karin Ritter American Petroleum Institute Washington, DC
IV-D-05	David Carroll Hunt Refining Company Tuscaloosa, AL
IV-D-06	David C. Foerter Institute of Clean Air Companies
IV-D-07	Norbert Dee National Petrochemical and Refiners Association Washington, DC
IV-D-08	Tom Lecorchick Owens Corning
IV-D-09	David G. Campbell San Joaquin Refining Company, Inc Bakersfield, CA
IV-D-10	R. Gronewold Tesoro Hawaii Corporation
IV-D-11	Russel K. Snyder Asphalt Roofing Manufacturers Association Washington, DC
IV-D-12	Peter T. Grass Asphalt Institute Lexington, KY
IV-D-13	Tom Lecorchick Owens Corning (supplemental comments)
IV-D-14	Don Ferrell Chevron Products Company San Ramon, CA
IV-D-15	F. David Hoffman, Jr. Tesoro Hawaii Corporation
IV-D-16	N. Dee National Petrochemical and Refiners Association Washington, DC

TABLE 1. DOCKET A-95-32
CATEGORY IV-D

Item Number	Commenter and Affiliation
IV-D-19	Steve Cousins Lion Oil Company El Dorado, AR
IV-D-25	Alice Crowe American Petroleum Institute Washington, DC
IV-D-26	Russell K. Snyder Asphalt Roofing Manufacturers Association Washington, DC
IV-D-27	Earl W. Arp Asphalt Institute
IV-D-28	Don Ferrell Chevron Product Company, Asphalt Division San Ramon, CA

[a]Comment letters are available in Docket A-95-32 (E-docket OAR-2002-0035) located at EPA's Office of Air and Radiation Docket and Information Center (MC-6102T), 1301 Constitution Avenue, NW, Washington, DC 20460, Room B108. The docket is available for public inspection and copying between 8:30 am and 4:30 pm Monday through Friday. A reasonable fee may be charged for copying.

2.0 SUMMARY OF COMMENTS AND RESPONSES

In addition to specific comments provided, several commenters (IV-D-08; IV-D-09) expressed overall support for the comments submitted by the Asphalt Roofing Manufacturers Association (ARMA). Six commenters (IV-D-04; IV-D-05; IV-D-09; IV-D-10; IV-D-14; IV-D-19) expressed support for the comments of the National Petrochemical and Refiners Association (NPRA). Two commenters (IV-D-09; IV-D-14) expressed support for the comments submitted by the American Petroleum Institute (API).

One commenter (IV-D-12) expressed support for and incorporated by reference the comments of ARMA regarding use of PM and THC as surrogates, applicability, maximum achievable control technology (MACT) floor levels and standards, compliance provisions, performance testing, and monitoring, recordkeeping, and reporting. The same commenter expressed support for and incorporated by reference the comments of NPRA regarding the definition of "oxidized asphalt" and clarification that the use of combustion devices at petroleum refineries for the destruction of hazardous air pollutants (HAP) according to the proposed rule does not cause the vent stream to be considered a fuel gas under new source performance standards (NSPS) subpart J.

One commenter (IV-D-14) expressed support for the comments submitted by the Asphalt Institute regarding: (1) clarification that only asphalt processing operations at petroleum refineries are covered by the NESHAP; (2) clarification that the standards apply only to roofing asphalt; and (3) excluding tanks and loading racks with low vapor pressure. The commenter also supported the comments submitted by ARMA regarding: the applicability regarding asphalt processing facilities and asphalt heating; and the timing of performance tests.

One commenter (IV-D-19) expressed support for the comments of NPRA and the Asphalt Institute, particularly those pertaining to: (1) the excessive cost of the regulation; (2) exclusion of refiners based on safety concerns; and (3) applicability of subpart J to vents controlled in a combustion device.

2.1 APPLICABILITY

2.1.1 Petroleum Refineries

Comment: One commenter (IV-D-03) stated that refineries should be excluded from the source category since they are already subject to the petroleum refineries NESHAP (40 CFR part 63, subpart CC). The commenter contended that the statement in the preamble that blowing stills were not covered by the petroleum refineries NESHAP is incorrect based on an EPA post-rule, public guidance document titled "Questions and Answers For the Refinery MACT I Rule, November 20, 1998" in which EPA confirmed that asphalt oxidizers are subject to the provisions of the NESHAP as miscellaneous process vents. The commenter provided the following excerpt from the document:

> "Question: Are vents from an asphalt oxidizer system a process vent under the Refinery MACT (and) will they be covered by the upcoming asphalt MACT?
> Answer: Vents from asphalt oxidizers are not specifically exempted from the applicability of the Refinery MACT. Currently, EPA is not intending to include asphalt oxidation units at refineries in the Asphalt Roofing and Processing NESHAP, which has not yet been proposed. It is apparent that vents from asphalt oxidation systems, if they meet the definition of miscellaneous process vent, are subject to the provisions of the Refinery MACT."

The commenter asserted that EPA did not intend to include asphalt oxidation units at refineries in the proposed asphalt NESHAP and that, based on the proposed asphalt rule, such units would be subject to two standards. The commenter concluded that refinery blowing stills should be subject to the petroleum refineries NESHAP because the proposed asphalt NESHAP is based on non-refinery units. Another commenter (IV-D-07) noted that refineries are already subject to the petroleum refineries NESHAP (40 CFR part 63, subpart CC) and the asphalt NSPS (40 CFR part 60, subpart UU).

Response: The commenter is incorrect in stating that blowing stills at refineries are subject to the petroleum refineries NESHAP (40 CFR part 63, subpart CC). First, the asphalt processing source category, as listed in the section 112 (c) list, makes clear that asphalt production at petroleum refineries is in the asphalt processing source category, not petroleum refining: "The Asphalt Processing source category includes any facility engaged in the preparation of asphalt at asphalt processing plants, petroleum refineries, and asphalt roofing plants." Second, the applicability provisions of the petroleum refining NESHAP contain no reference to asphalt production activities as being covered by that rule. See 40 CFR section 63.640 (a) and (c) (enumerating operations which are covered by the petroleum refining MACT rule, asphalt processing not being among them). Third, the present rule, Subpart LLLLL, was developed using data for asphalt processing operations located at petroleum refineries, stand-alone asphalt processing facilities, and asphalt roofing manufacturing facilities and specifically covers the asphalt processing source category.

The Q&A document cited by the commenter is not part of the rulemaking record and should not be used as the basis for determining applicability of the petroleum refinery NESHAP. As stated in the disclaimer in beginning of Q&A document ". . . these views have not undergone any formal EPA review. The EPA recommends that you consult your State of local air pollution control agency for any final determinations . . .These questions and answers may be revised without public notice." A better source for applicability clarifications is the Background Information Document (BID) for the petroleum refineries NESHAP, which is part of the petroleum refinery NESHAP rulemaking record, and also is being placed in the administrative record for the present rule. The BID (page 3-51) includes a response to a comment requesting that "asphalt" be added to the list of refinery products. The EPA stated that "The final rule has not added "asphalt" to the list of refinery products regulated by 40 CFR part 63, subpart CC because "asphalt processing" is scheduled for development of a MACT standard in the year 2000." Based on this response, as well as the relevant regulatory text in the petroleum refining MACT standard, it was clearly not EPA's intent to regulate asphalt processing under the petroleum refineries NESHAP and no changes will be made to that rule.

Regarding the document the referenced by the commenter ("Questions and Answers For the Refinery MACT I Rule, November 20, 1998"), the document does not explicitly say that

asphalt processing operations are subject to the petroleum refinery NESHAP. Rather, the document states that an asphalt processing vent would be subject to the petroleum refinery NESHAP if it met the definition of a miscellaneous process vent in that rule. A miscellaneous process vent is defined in the petroleum refinery NESHAP as ". . . a gas stream . . . that is . . . discharged under normal operations at a petroleum refinery process unit." The definition of "petroleum refinery process unit" in the petroleum refinery NESHAP does not specifically identify asphalt processing and was not intended to cover those processes. Indeed, all of the processes cited explicitly and provided as examples in the petroleum refinery process unit definition occur upstream of asphalt processing operations and typically involve petroleum materials that have much higher vapor pressures (and emissions) than encountered in asphalt processing operations.

2.1.2 Major Sources

Comment: One commenter (IV-D-08) requested clarification on the distinction between "major sources" and "area sources" with respect to emissions related to the use of chloride-based catalyst. Two commenters (IV-D-08; IV-D-11) asserted that HAP emissions from chloride-based catalyst should be included in a facility's potential to emit only if the facility is permitted through an appropriate federally-approved operating permit to use chloride-based catalysts.

Response: The EPA does not agree that it is necessary or appropriate to stipulate in the final regulation that emissions from chloride-based catalyst should be included in a facility's potential-to-emit calculation only if the facility is permitted to use chloride-based catalysts through an appropriate federally-approved operating permit. The definition of potential to emit in 40 CFR 63 reads, in part: "Potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design..." If a facility uses catalyst, then the facility is, by definition, "operationally designed" to do so and the emissions from such catalyst use should be included in the facility's potential-to-emit calculations. However, if the commenters are concerned that a facility that has the physical capability to use catalyst would be required to consider emissions from catalyst use in their potential-to-emit calculation, even though the facility does not intend to use a catalyst, then they should add a condition to their operating permit to stipulate that the facility would not use such catalyst.

2.1.3 Area Source Determinations

Comment: One commenter (IV-D-11) stated that EPA should provide a streamlined procedure in the rule for facilities to determine area source status since area sources will not be subject to the NESHAP. The commenter added that testing should not be required to demonstrate that a source is an area source due to the high cost. The commenter suggested that this could be accomplished using emission factors that provide reasonable estimates of HAP emissions. The commenter added that they have been developing such emission factors and expressed the hope of working closely with EPA to finalize them.

Response: Facilities are not required to conduct a performance test to determine area source status. Engineering judgment and/or reasonable emission factors can be used to determine area source status. The owner or operator is reminded that area source status is determined by a facility's potential to emit, not actual HAP emissions. Determinations need not be reported, but must be kept at the source as specified in section 63.10(b) of the NESHAP general provisions (40 CFR part 63, subpart A). Additionally, the determinations must be sufficiently detailed to allow the Administrator to make a finding of the source's applicability status with regard to the relevant standard.

2.1.4 Allocation of Shared Tanks and Adhesive Applicators

Comment: One commenter (IV-D-11) expressed support for EPA's proposed approach for allocating shared storage tanks and adhesive applicators. The commenter agreed that it is necessary to allocate shared units to one regulated facility or line or another.

Response: This approach has been retained in the final rule.

2.1.5 Equipment in Hazardous Air Pollutant Service for Limited Time

Comment: One commenter (IV-D-03) stated that asphalt loading racks and storage tanks that handle other asphalt may occasionally load and store oxidized asphalt. The commenter asserted that the proposed NESHAP should not apply to such equipment. The commenter noted that other MACT standards provide such exemptions and provided the example of the petroleum refineries NESHAP, which exempts equipment in HAP service for less than 300 hours per year.

Response: The EPA contends that such an exemption is not necessary or appropriate. If a storage tank is associated with asphalt processing (i.e., the storage tank is used to store asphalt flux or oxidized asphalt), then that tank is subject to the asphalt processing and asphalt roofing manufacturing NESHAP. Similarly, if a loading rack is used to load processed (oxidized) asphalt for transfer off-site, then that loading rack would also be subject to this NESHAP. It should be noted that the exemption cited by the commenter (equipment, such as valves, pumps, and connections, in HAP service less than 300 hours per year) does not apply to storage vessels or transfer operations. The petroleum refineries NESHAP does not have an exemption for storage vessels or transfer loading racks in HAP service for a limited time and EPA does not see a need for providing such an exemption for asphalt processing. Nor is it clear that there could even be a rationale for exempting such units, since most such units are currently controlled, and hence, at a minimum, subject to control at the MACT floor level reflecting the average of the best-controlled 12 percent of sources.

2.1.6 Straight Run Asphalt

Comment: One commenter (IV-D-10) stated that the proposed rule is inequitable because it exempts asphalt produced directly from vacuum distillation towers (straight-run asphalt). The commenter said that they do not produce roofing asphalt, but must blow the paving grade asphalt they produce to meet specifications. The commenter stated that they would face a competitive disadvantage if required to control storage tanks and loading racks while their competitors who produce straight-run asphalt are allowed to operate without similar controls. The commenter speculated that similar inequities exist at similar facilities elsewhere in the nation.

Response: The applicability of this NESHAP is based on the source category definition ("Documentation for Developing the Initial Source Category List " EPA-450/3-91-030, July 1992) of "asphalt processing" that reads, in part: "The Asphalt Processing source category includes any facility engaged in the preparation of asphalt at asphalt processing plants, petroleum refineries, and asphalt roofing plants. Asphalt preparation, called "blowing," involves the oxidation of asphalt flux by bubbling air through the liquid asphalt flux at 260 ^{o}C for 1 to 4.5 hours, depending upon the desired characteristics of the asphalt." This source category

definition does not contain any restrictions on the source of asphalt flux processed. Consequently, this NESHAP applies to processing of asphalt produced from fractional distillation and vacuum distillation.

2.1.7 Research and Development Facilities

Comment: One commenter (IV-D-01) requested that EPA provide an exemption for research and development (R&D) activities and for activities in analytical laboratories. The commenter noted that several other NESHAP include an exemption for R&D activities. In addition, the commenter noted that section 112 (c)(7) of the Clean Air Act (CAA) recognizes the uniqueness of R&D facilities and directs EPA to establish a separate source category for research and laboratory facilities. The commenter recommended specific language for the definition of R&D activities.

Response: The EPA added language to the applicability section of the NESHAP specifically exempting R&D equipment. The final rule contains the following definition of research and development equipment, which is based on section 112 (c)(7) of the CAA:

> Research and development equipment means any equipment whose primary purpose is to conduct research and development to develop new processes and products, where such equipment is operated under the close supervision of technically trained personnel and is not engaged in the manufacture of products for commercial sale in commerce, except in a de minimis manner.

2.1.8 Manufacturing Processes and Lines vs. Individual Equipment

Comment: One commenter (IV-D-02) noted that the definition of asphalt processing facility indicates that the facility includes asphalt heating, blowing stills, asphalt flux storage tanks, oxidized asphalt storage tanks, and oxidized asphalt loading racks. However, according to the commenter, the rule is not clear on whether a facility must have all or only some of these units to constitute an asphalt processing facility, or even whether an asphalt processing facility could consist of a process not contained in the list. For example, the commenter suggests that a facility that receives asphalt in blocks or as heated liquid and mixes the asphalt with other materials to make an intermediate or final product could be considered an asphalt processing facility under the present definition.

The commenter also asked EPA to clarify whether the standard would apply only to an entire line of asphalt processing equipment or whether it could apply to individual pieces of process equipment that could be used in asphalt processing. The commenter suggested that EPA's intent, as revealed by the rationale for the definition of affected source (66 FR 58617) is that a source must have an entire line of asphalt processing equipment to be considered an asphalt processing facility and that the standards will be applied to an entire line rather than individual pieces of equipment.

The same commenter also noted that it appears that the rule would apply to any aspect of asphalt processing that may be located at a facility, even if the asphalt processing is not a major source of HAP, but the facility is a major source of HAP based on other activities at the facility. The commenter questioned whether this was, in fact, EPA's intent.

Response: The EPA agrees with the commenter that the definition of asphalt processing facility needs clarification, and EPA has revised the definition in the final rule to clarify the distinction between asphalt processing facilities and other facilities that may use or store asphalt. The revised definition indicates that, to be considered an asphalt processing facility, the facility must have one or more blowing stills and be engaged in the oxidation of asphalt in the blowing stills. A facility without blowing stills is not considered to be an asphalt processing facility regardless of the presence of any other emission points or equipment.

Also, to be considered an asphalt processing facility, it is not necessary to have all of the other equipment listed in the definition (asphalt flux storage tanks, oxidized asphalt storage tanks, and oxidized asphalt loading racks), but it is likely that most, if not all of this equipment will be found at facilities engaged in the oxidation of asphalt in blowing stills. For example, many asphalt processing facilities do not, in fact, have loading racks because the oxidized asphalt is used on-site. However, they would still be considered to be asphalt processing facilities and subject to the standards because of the presence of blowing stills.

The discussion of the affected source in the proposal preamble cited by the commenter pertains to determining whether a facility would be subject to the standards for existing sources or for new and reconstructed sources. The affected source is broadly defined as an entire line for both asphalt processing and asphalt roofing manufacturing to avoid a complicated mix of new and existing equipment on a single line that are subject to potentially different standards and

compliance dates. However, an affected source does not have to contain all of the specified processes to be subject to the rule. For example, an asphalt roofing manufacturing line may not have a saturator, wet looper, and adhesive applicator, but the remaining equipment (e.g., storage tanks, coating mixer, coater, and sealant applicator) collectively would be considered a single affected source and therefore subject to the standards.

The commenter is correct in concluding that the standards would apply to an asphalt processing facility or roofing manufacturing facility, even if that facility is not a major source in and of itself, but is part of a major source based on combined emissions with other activities at the same plant site. As defined in the CAA (section 112 (a)(1)), the term "major source" means "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." This definition does not confine the major source determination to unit operations within a single category, and EPA has long maintained this interpretation. This interpretation has also been upheld in National Mining Association, et al., v. EPA , 59 F. 3d 1351, 1356-57 (D.C. Cir. 1995). One example would be blowing stills and oxidized asphalt storage tanks located at a petroleum refinery. Although the emissions from the blowing stills and oxidized asphalt storage tanks may not exceed the major source HAP emission thresholds by themselves, the total HAP emissions from the petroleum refinery must also be considered in determining whether the entire plant site is a major source. Put another way, if the entire plant site is a major source, then the blowing stills and oxidized asphalt storage tanks would be subject to the requirements of the standards regardless of their emissions.

2.1.9 Affected Source

Comment: One commenter (IV-D-11) agreed that the "affected source" should be defined as the asphalt processing facility and the asphalt roofing manufacturing line, rather than as individual pieces of equipment. The commenter agreed that minor changes to a processing facility or manufacturing line should not trigger standards for new sources, which would serve as a disincentive to undertaking pollution prevention efforts or making necessary changes to outdated equipment.

Response: The definition of affected source has been retained in the final rule.

2.1.10 Clarification of Rule Applicability

Comment: One June 21, 2002, EPA sent letters to the persons commenting on the proposed rule (Docket No. OAR-2002-0035). The letters clarified two aspects of the proposal:

- the proposed NESHAP is intended to cover all asphalt processing regardless of the asphalt's end use, and
- requirements for storage vessels at asphalt roofing manufacturing facilities, inadvertently left out of the proposed NESHAP, are the same as those for storage vessels at asphalt processing facilities.
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Five commenters (IV-D-15; IV-D-16; IV-D-27; IV-D-25; IV-D-28) contended that EPA should address the clarification that the NESHAP is applicable to all asphalt processing in a supplemental proposal. One commenter (IV-D-27) noted that different letters concerning different points were sent to parties who commented on the proposal. The commenter stated that this action further supports the need for a supplemental proposal. The commenter stated that, to provide a true opportunity for comment, as required by section 307 of the CAA and section 553 of the Administrative Procedure Act, EPA should provide the entire public with notice on these issues. The commenter argued that this can only be done through a Federal Register notice, as required under section 307(d)(3) of the CAA.

One commenter (IV-D-16) noted that EPA's fact sheet for the proposed rule states that the regulation would apply to sources of toxics from asphalt processing facilities and asphalt roofing manufacturing facilities. The fact sheet goes on to state that asphalt processing facilities produce "blown asphalt for the asphalt roofing manufacturing industry." The commenter also stated that their interpretation of the proposed rule applicability was influenced by an electronic mail (email) communication with EPA which asked if only those refineries with asphalt roofing flux blowing operations would be affected by this NESHAP. The commenter asserts that EPA's response to the email was affirmative (i.e., the NESHAP would only apply to refineries with asphalt roofing flux blowing operations). The commenter also said that the rule preamble, which defines the scope of the rule, should govern over a one paragraph description of the source category (which does not limit asphalt processing to roofing flux) that was written in 1992.

Three commenters (IV-D-15; IV-D-16; IV-D-25) contended that the proposed definition *(Asphalt flux means that residual material from distillation of crude oil used to manufacture asphalt roofing products*) should be read absolutely literally so that only asphalt flux used to produce limits the meaning of asphalt flux to asphalt roofing products would be covered by the rule. One commenter (IV-D-15) disagreed with the interpretation in the letter regarding applicability of the proposed NESHAP to asphalt processing facilities other than those that process roofing asphalt. The commenter noted that the interpretation of applicability is particularly important to their company because they produce oxidized asphalt used solely for road paving.

Another commenter (IV-D-25) stated that under well-understood principles of statutory and regulatory construction, asphalt flux other than that explicitly described is by implication excluded from the definition, especially if there is no qualifying language such as "asphalt flux includes, but is not limited to roofing asphalt." The commenter argued that the fact that the definition does not contain the term "used solely for roofing asphalt" is of no consequence as a definition is limited by its very nature to what it expressly covers. The commenter added that if there is inconsistency between a rule and its preamble, courts have determined that the rule language is binding, citing Florida Power & Light Company v. EPA. The commenter concluded that, if EPA intends to cover all asphalt processing, it must re-propose the rule with a revised definition of asphalt flux that includes all asphalt processing. Another commenter (IV-D-28) argued that the proposed clarification broadens a very explicit definition and significantly increases the number of affected storage tanks and loading racks.

Response: A number of commenters to EPA's June 12, 2002 letters argued that they were provided inadequate notice and opportunity to comment on the matters set out in that letter, and urged that EPA instead repropose various provisions of the rule. Certainly as to these commenters, notice was entirely adequate. It has long been held that actual notice constitutes adequate notice and opportunity for comment for purposes of section 307 of the CAA. See Small Lead Refiner Phase Down Task Force v. EPA, 705 F. 2d 507, 548 (D.C. Cir. 1983). The extensive comments submitted by each respondent likely demonstrates that they both had adequate notice, and availed themselves of it. There is no credible claim that further comments could have been submitted had there been more notice, or that the time for response was

inadequate. Under these circumstances, EPA believes that it afforded all letter recipients adequate notice and opportunity for comment. EPA also notes that it sent letters to all commenters to the proposed rule and made a point of alerting relevant trade associations to the matters under consideration, again, in the Agency's view, showing adequacy of notice and opportunity for comment. Additionally, the fact that different letters were sent to the various industry parties is immaterial. All of the letters distributed by EPA regarding the clarification of the rule applicability contained the same information.

It was never EPA's intent to limit the applicability of the proposed NESHAP to processing of roofing asphalt flux only. Regarding the commenter's assertion that this intent was conveyed through email communications, EPA contends that the commenter misinterpreted EPA's response to their questions. As discussed in section 2.2.1.1 of this document, as well as the preamble to the final rule, it was EPA's intent to be consistent with the source category definition of "asphalt processing" which is not limited to the processing of asphalt for roofing manufacturing. The EPA regrets that confusion regarding applicability may have been caused by the definition of asphalt flux in the proposed NESHAP. The limitation to asphalt roofing products in the proposed definition was an error that has been corrected in the promulgated rule.

Regarding the commenter's citation of the NESHAP fact sheet, the language in the fact sheet was not intended to limit the applicability of the rule. Rather, EPA's intention was to illustrate that asphalt processing operations can be collocated with asphalt roofing manufacturing facilities and petroleum refineries. This is supported by the fact that the background section of the fact sheet (which immediately follows the section cited by the commenter) refers to EPA's statutory requirement to identify source categories that emit one HAP and to develop standards that restrict emissions to levels consistent with the lowest-emitting plants.

2.1.11 Asphalt Processing

Comment: One commenter (IV-D-19) , in his response to EPA’s June 21, 2002 letter which clarified the applicability of the proposed NESHAP, applauded EPA’s intent to revise the language of the final rule to clarify that if a facility does not have a blowing still, then it would not be considered to be an asphalt processing facility. The commenter noted that a matter of this importance should not be left to the preamble or to EPA guidance.

Response: The EPA agrees that it is important that the applicability of the NESHAP be clearly stated in the final rule. Therefore, the final rule has been revised to clarify the applicability of the NESHAP.

2.1.12 Overlap With Other Rules

Comment: Two commenters (IV-D-09; IV-D-12) suggested that the following new sentence should be added to the definition of "asphalt processing facility" to clarify that a unit or process subject to the petroleum refineries NESHAP is not subject to the proposed standard: "Any unit or process subject to any other standard codified in any subpart of this part 63 is not subject to the standards of this subpart." Another commenter (IV-D-28) suggested that EPA modify applicability criteria to state that control requirements imposed at an asphalt processing facility do not apply to collocated petroleum refinery facilities that are not otherwise subject to the asphalt NESHAP.

Response: The EPA disagrees with the suggestion to exclude from the rule "any unit or process subject to any other standard codified in any subpart of this Part 63..." The EPA finds the suggestion to be too general and believes it could result in confusion. However, EPA agrees that additional clarification was required regarding potential overlap of regulations. Language was added to the final rule (section 63.8681 (e)) to state that any unit or process subject to the petroleum refinery NESHAP is not subject to the asphalt processing and asphalt roofing manufacturing NESHAP.

2.2 DEFINITIONS

2.2.1 Asphalt processing facility

2.2.1.1 Roofing vs. Non-roofing Asphalt

Comment: Two commenters (IV-D-04; IV-D-07) suggested that the definition of asphalt processing facility should be revised to read: "An asphalt processing facility includes only facilities which are engaged in the blowing or oxidizing of asphalt roofing flux by bubbling air through the asphalt. An asphalt processing facility, for the purpose of this rulemaking, includes only asphalt roofing flux blowing stills, asphalt roofing flux blowing still feed storage tanks, oxidized asphalt storage tanks (i.e., asphalt roofing flux blowing still product tanks), and

oxidized asphalt loading racks." Another commenter (IV-D-28) suggested that the definition should be revised to read: “Asphalt processing facility means any facility engaged in preparing oxidized asphalt (‘blowing’) at asphalt processing plants, petroleum refineries, and asphalt roofing plants. Asphalt preparation, called ‘blowing,’ is the oxidation of asphalt flux by bubbling air through heated asphalt. An asphalt processing facility may include the following associated processes and equipment: asphalt heating, asphalt flux storage tanks, oxidized asphalt storage tanks, and oxidized asphalt loading racks.”

Two commenters (IV-D-09; IV-D-12) suggested that EPA should revise the definition of asphalt processing facility to specify which asphalt processing operations are subject to the rule. The commenters (IV-D-09; IV-D-12) claimed that EPA's intent, based on the proposed rule and supporting documents, was to cover only asphalt processing operations that produce roofing asphalt. The commenters (IV-D-09; IV-D-12) asserted that the first sentence of the definition of "asphalt processing facility" would cause all asphalt processing operations to be subject to the rule, regardless of whether the asphalt is to be used for roofing, paving, or other applications. One commenter (IV-D-09) noted that asphalt processing and raw materials often differ depending on the type of asphalt made. The commenter suggested that the first sentence of the definition be amended as follows (new text underlined): "Asphalt processing facility means any facility engaged in the preparation of <u>roofing</u> asphalt at asphalt processing plants, petroleum refineries, and asphalt roofing plants."

Another commenter (IV-D-13) contended that it was not EPA's intent for the proposed rule to apply only to asphalt processing operations at roofing manufacturing facilities or to asphalt being processed to produce roofing asphalt. The commenter asserted that HAP generated during asphalt processing are largely independent of the asphalt product being produced (e.g., roofing or paving asphalt) and the type of facility at which the processing is taking place (e.g., a petroleum refinery or roofing manufacturing facility). The commenter listed the following similarities between various asphalt processing operations:

- roofing products are blown to softening points ranging between 100°F and 230°F, paving products are blown to softening points ranging between 120°F and 160°F
- paving products can also be made by blowing to a high softening point then blending the material with the original feedstock

- a wide variety of feedstocks are used to make asphalt roofing products using the air blowing process - including paving asphalt - that are identical to those which would be air-blown for paving

- vacuum tower bottoms can be used to manufacture both paving products and roofing products with the air blowing process

- ferric chloride (frequently used as a blowing agent in the manufacture of roofing asphalt) can also be used as a blowing agent in the manufacture of paving asphalt.

The commenter reminded EPA that "asphalt processing" and "asphalt roofing manufacturing" were initially listed as separate source categories only later merged for the sake of convenience and regulatory economy. The commenter stated that this merger was in no way the result of an intention to regulate only those asphalt processing activities that are related to roofing manufacturing. The commenter concluded that EPA should reject any comment that suggests that the proposed NESHAP should apply only to asphalt processing directly related to roofing manufacturing operations. The commenter stated that the intention was and still is to regulate asphalt processing activities that have the potential to be major sources of HAP regardless of what type of facility the processing is conducted at, and regardless of what type of end product is being produced.

Another commenter (IV-D-15) interpreted the definition in the proposed rule to mean that if a facility is engaged in "asphalt preparation" then all of the processes mentioned in the proposed definition of "asphalt processing facility" (e.g., asphalt flux storage tanks and oxidized asphalt storage tanks) would be subject to control requirements whether or not the processes managed materials used in the roofing market. The commenter contended that under the current definition of asphalt processing facility, all storage and loading of flux and blown asphalt could be required to be controlled even though the asphalt may not be used in roofing products. The commenter expressed the concern that, because they have blowing stills, a small number of refineries would have to install expensive controls while most others with similar sources would not. The commenter requested clarification regarding EPA's intent for requiring control of emission sources that are not related to roofing products.

Response: The source category definition ("Documentation for Developing the Initial Source Category List " EPA-450/3-91-030, July 1992) of "asphalt processing" reads as follows:

"The Asphalt Processing source category includes any facility engaged in the preparation of asphalt at asphalt processing plants, petroleum refineries, and asphalt roofing plants. Asphalt preparation, called 'blowing,' involves the oxidation of asphalt flux by bubbling air through the liquid asphalt flux at 260 ^{o}C for 1 to 4.5 hours, depending upon the desired characteristics of the asphalt. The category includes, but is not limited to, the following process: asphalt heating, blowing still, and asphalt storage tanks." This definition is not limited to the processing of asphalt for roofing manufacturing. Consistent with the source category definition, it was not EPA's intent to limit the NESHAP applicability to the processing of roofing asphalt. The EPA agrees with the commenter who contended that the identity and concentration of HAP generated during asphalt processing are largely independent of the end use of the asphalt product being produced and finds that there is no factual basis for excluding the processing of non-roofing asphalt from this NESHAP.

Confusion regarding applicability may have been caused by addressing both the asphalt roofing manufacturing and asphalt processing source categories under one NESHAP. This was done because many facilities both process asphalt and manufacture roofing products, but it was not meant to limit the NESHAP applicability to facilities that process roofing asphalt only. Confusion may have also been caused by the definition of asphalt flux in the proposed NESHAP, which read: "asphalt flux means the residual material from distillation of crude oil used to manufacture asphalt roofing products." Considering the confusion noted by commenters, a further opportunity for comment on this issue was provided by EPA to ensure adequate notice on the issue of the rule's applicability (see section 2.1.10).

The information used to develop the standards for asphalt processing equipment included data from asphalt processing operations located at stand-alone processing facilities, roofing manufacturing facilities, and petroleum refineries and was not limited to facilities that process asphalt flux intended for use in roofing products only. Additionally, the proposal preamble did not limit the affected source definition to asphalt processing facilities that process asphalt flux intended for use in roofing products.

The limitation to asphalt roofing products in the asphalt flux definition was an error that has been corrected in the promulgated standard. The definition of asphalt processing facility has been revised in the final NESHAP to read as follows: "Asphalt processing facility means any

facility engaged in the preparation of asphalt flux at stand-alone asphalt processing facilities, petroleum refineries, and asphalt roofing facilities. Asphalt preparation, called "blowing," is the oxidation of asphalt flux, achieved by bubbling air through the heated asphalt, to raise the softening point and reduce the penetration of the oxidized asphalt. An asphalt processing facility includes one or more asphalt flux blowing stills, asphalt flux storage tanks supplying asphalt flux to the blowing stills, oxidized asphalt storage tanks, and oxidized asphalt loading racks."

2.2.1.2 Asphalt Heating

Comment: Several commenters stated that the term "asphalt heating" should be deleted from the definition of asphalt processing facility. One commenter (IV-D-11) said that, if EPA's intent of including the term is to address heating in tanks, than this is already accomplished by the inclusion of "associated storage and process tanks" in the definition of asphalt processing facility. The commenter added that any heating in preheaters associated with the storage tanks would also be regulated under the proposed rule because they are part of a closed system that includes the tanks. One commenter (IV-D-12) said that the term should be deleted because it is unclear to what process the term refers. Another commenter (IV-D-03) stated that the term should be deleted because asphalt heating is not part of the affected facility as proposed. One commenter (IV-D-14) explained that the term "asphalt heating" could apply to any heating of asphalt stocks in distillation or other process equipment upstream of the blowing still, heating coils in tanks, and heating of transfer lines. The commenter contended that the equipment that could possibly be considered "asphalt heating" goes well beyond the blowing still preheaters directly associated with the blowing stills that EPA intended to cover. The commenter suggested "asphalt heating" be removed from section 63.8681 (a)(1) and the definition of asphalt processing facility in section 63.8689.

Response: The EPA disagrees with the comment that asphalt heating is not part of the affected source. "Asphalt heating" is specifically identified in the source category definition of "asphalt processing," as explained in the response to the comments regarding the applicability of the rule (see section 2.2.1.1). However, EPA agrees with the commenters that it is not necessary to specifically name asphalt heating in the NESHAP definition of asphalt processing facility because this operation is covered by the definitions of "asphalt processing facility" and "asphalt

storage tank." If heating takes place in a blowing still preheater, emissions would be addressed through the blowing still requirements. If asphalt heating takes place in a storage vessel, associated emissions would be addressed through the storage vessel requirements. Separate standards for emissions from asphalt heating do not exist. Therefore, the term "asphalt heating" has been removed from the definition of "asphalt processing facility" in the final rule. Emissions from any combustion source used to generate heat or steam that is used in the asphalt heating process are not covered under this NESHAP.

2.2.1.3 Asphalt Processing Facility

Comment: Two commenters (IV-D-09; IV-D-12) suggested that the following language (underlined) should be added to the proposed definition of asphalt processing facility: "Asphalt processing facility means any facility engaged in the preparation of asphalt at asphalt processing plants, petroleum refineries, and asphalt roofing plants. Asphalt preparation, called "blowing" is the oxidation of asphalt flux by bubbling air through the heated asphalt. An asphalt processing facility includes the following processes that directly support such asphalt preparation and are located at a facility containing a blowing still: asphalt heating, blowing stills, asphalt flux storage tanks, oxidized asphalt storage tanks, and oxidized asphalt loading racks." The commenters (IV-D-09; IV-D-12) suggested that, without the change, the definition could lead someone to believe that units such as asphalt storage tanks found at a refinery are covered even though the refinery does not process asphalt, which would be contrary to the rule's intent.

Several commenters (IV-D-09; IV-D-12; IV-D-14) stated that it is important for EPA to clarify that a facility will not be subject to the standards unless it has asphalt blowing operations. One commenter (IV-D-14) stated that this is not clear in the preamble or the regulatory text. According to the commenters (IV-D-09; IV-D-12), the change would also clarify that only operations directly associated with the blowing are covered by the rule, avoiding confusion about whether "upstream" units at a refinery are covered.

Response: The EPA agrees that the term "asphalt processing facility" is intended to apply only to facilities that use a blowing still to oxidize asphalt to increase the softening point and decrease the penetration of the asphalt. The definition in the proposed NESHAP could have

been misinterpreted to include refinery asphalt tanks not associated with asphalt processing. To remedy this, EPA revised the definition of asphalt processing facility.

2.2.2 Asphalt storage tank

Comment: Two commenters (IV-D-04; IV-D-07) suggested that the definition for asphalt storage tank should read: "For the purpose of this rulemaking, asphalt storage tank means any tank used to store asphalt roofing flux, oxidized asphalt, and modified asphalt at asphalt roofing manufacturing plants and asphalt processing facilities." Other commenters (IV-D-09; IV-D-12) stated that the definition should be revised to read: "Asphalt storage tank means any tank used to store asphalt, including asphalt flux, oxidized asphalt, and modified asphalt, at asphalt roofing manufacturing plants and asphalt processing facilities." The commenters (IV-D-09; IV-D-12) suggested the change from "asphalt processing plants" to "asphalt processing facilities" to use consistent terms and the deletion of "petroleum refineries" because they are included in the term "asphalt processing facility."

Response: The EPA disagrees with the commenter's suggestion to limit definition of "asphalt storage tank" only to asphalt roofing flux since the NESHAP covers processing of all types of asphalt, regardless of end use. The EPA also disagrees with the commenter's suggestion to remove petroleum refineries from the list of sources that can have asphalt storage tanks on-site since the NESHAP regulates asphalt processing operations (including asphalt storage tanks supplying asphalt to blowing stills) located at petroleum refineries. The EPA agrees with the commenters that the term "asphalt processing facilities" should be used rather than "petroleum refineries and asphalt processing plants" and that it is possible that the definition could be misinterpreted to include refinery asphalt tanks not associated with asphalt processing. Also, the definition of "asphalt processing facility" specifically includes processing operations at petroleum refineries. Consequently, the definition of asphalt storage tank has been revised to read: "Asphalt storage tank means any tank used to store asphalt flux, oxidized asphalt, and modified asphalt, at asphalt roofing manufacturing facilities, petroleum refineries, and asphalt processing facilities. Storage tanks containing cutback asphalts (asphalts diluted with solvents to reduce viscosity for low temperature applications) and emulsified asphalts (asphalts dispersed in water with an emulsifying agent) are not subject to this subpart."

2.2.3 Asphalt loading rack

Comment: Two commenters (IV-D-04; IV-D-07) suggested that the definition for asphalt loading rack should read: "For the purpose of this rulemaking, asphalt loading rack means the equipment used to transfer oxidized asphalt, resulting from the blowing of asphalt flux, from a storage tank into a tank truck, rail car, or barge." Other commenters (IV-D-09; IV-D-12) suggested that language (underlined) be added to the definition to ensure that loading racks not associated with asphalt processing operations are not subject to the rule: "Asphalt loading rack means the equipment at an asphalt processing facility used to transfer asphalt from a storage tank into a tank truck, rail car, or barge."

Response: The EPA agrees that the definition should be clarified so the rule does not apply to loading of other products or to refineries that do not blow asphalt. The definition of loading rack has been revised to read: "Asphalt loading rack means the equipment at an asphalt processing facility used to transfer oxidized asphalt from a storage tank into a tank truck, rail car, or barge."

2.2.4 Oxidized asphalt

Comment: Two commenters (IV-D-04; IV-D-07) suggested that oxidized asphalt should be identified as "pure blown asphalt" to ensure that the blending of oxidized asphalt with other asphalt products does not trigger any requirements of the rule.

Response: With the exceptions of cutback and emulsified asphalts, oxidized asphalt blended with other asphalt products or other materials are not exempted from the rule. For example, the rule applies to modified bitumen facilities, which blend oxidized asphalt with polymeric modifiers. Therefore, no change has been made to the definition of oxidized asphalt in the final rule.

2.2.5 Saturator and Coater

Comment: One commenter (IV-D-11) expressed concern regarding the inclusion of "coater" in the definition for "saturator." The commenter noted that the saturator definition follows the definition in the asphalt NSPS (40 CFR part 60, subpart UU). The commenter contended that it is more accurate to differentiate between the saturator and the coater because

they are separate units with different characteristics. The commenter suggested that a separate definition of coater that reads "a piece of equipment to apply amended (filled or modified) asphalt coating to the top and bottom of the base substrate used in the manufacture of shingles and rolled roofing products." The commenter suggested edits to the definition of "saturator," "asphalt roofing manufacturing line," and tables in subpart LLLLL to dissociate coaters from saturators. Another commenter (IV-D-08) also suggested removing the word "coater" from the definition of "saturator."

Response: The definition of "saturator" in the proposed NESHAP is taken from the asphalt NSPS. However, EPA agrees with the commenter that the definition does not accurately reflect current roofing manufacturing operations, which may not include a saturator. Therefore, the term "coater" has been removed from the revised definition of "saturator." A separate definition has been included for "coater." The new definition for "coater" reads as follows: "Coater means the equipment used to apply amended (filled or modified) asphalt to the top and bottom of the substrate (typically fiberglass mat) used to manufacture shingles and rolled roofing products." The revised saturator definition reads as follows: "Saturator means the equipment in which substrate (predominantly organic felt) is filled with asphalt. Saturators are predominantly used for the manufacture of saturated felt products. The term saturator includes the saturator and wet looper."

2.2.6 Asphalt Roofing Manufacturing Line

Comment: One commenter (IV-D-11) suggested that the definition of "asphalt roofing manufacturing line" be corrected to more accurately describe how the number of lines at a facility is to be determined. The commenter suggested that the last sentence should be revised to state (new language underlined): "For example, an asphalt roofing manufacturing facility with two parallel saturators (or two parallel coaters) would be considered to have two separate roofing manufacturing lines."

Response: The commenter's suggestion is consistent with EPA's intent for determining the number of lines at a facility. It is also consistent with EPA's revised approach to define saturators and coaters as separate pieces of equipment. Therefore, the definition of "asphalt roofing manufacturing line" has been revised as follows: "Asphalt roofing manufacturing line

means the collection of equipment used to manufacture asphalt roofing products through a series of sequential process steps. An asphalt roofing manufacturing line includes a saturator (including wet looper), and/or coater their associated coating mixers, sealant applicators, adhesive applicators, and asphalt storage and process tanks. The number of asphalt roofing manufacturing lines at a particular facility is determined by the number of saturators (or coaters) operated in parallel. For example, an asphalt roofing manufacturing facility with two saturators (or coaters) operating in parallel would be considered to have two separate roofing manufacturing lines."

2.2.7 Modified Asphalt

Comment: One commenter (IV-D-11) suggested that EPA should substitute the word "polymer" for "plastic" in the definition for modified asphalt. The commenter explained that facilities use modifiers other than plastics to make modified asphalt and the use of different additives is likely to grow over time. The commenter stated that using the term "polymer" would be more accurate and less confusing because it would capture the variety of different additives that may be used to create modified asphalt.

Response: The EPA agrees with the commenter's suggestion. The definition of "modified asphalt" has been modified to read: "Modified asphalt means asphalt that has been mixed with polymer modifiers."

2.2.8 Adhesive applicator

Comment: One commenter (IV-D-11) recommended that the term "single-ply" in the definition of "adhesive applicator" should be deleted. The commenter explained that adhesive applicators are used to apply adhesive to shingles other than single-ply shingles.

Response: The EPA agrees with the commenter's suggestion. The definition of "adhesive applicator" has been modified to read as follows: "Adhesive applicator means the equipment used to apply adhesive to roofing shingles for producing laminated or dimensional roofing shingles."

2.2.9 New Definitions

Comment: One commenter (IV-D-03) stated that definitions are needed for "asphalt processing plants," "petroleum refineries," and "asphalt roofing plants" and suggested that these definitions could be obtained from other rules. Another commenter (IV-D-02) asked EPA to clarify the definitions of asphalt processing facility and asphalt processing plant. The commenter noted that the proposed definition of asphalt processing facility includes the term "asphalt processing plant," but does not indicate how an asphalt processing facility would differ from an asphalt processing plant.

Response: The terms "asphalt roofing manufacturing plant" and "asphalt processing plant" were used in the proposed definition of "asphalt storage tank." The EPA agrees that the use of these terms is inconsistent with the rest of the rule. Therefore, the definition of "asphalt storage tank" has been revised using the terms "asphalt roofing manufacturing facility" and "asphalt processing facility," which are defined in the rule and used in the applicability section (section 63.8681 (1)(a)). Therefore, definitions for "asphalt roofing manufacturing plant" and "asphalt processing plant" are no longer needed. Also, EPA contends that it is not necessary to define "petroleum refinery" in the context of the asphalt processing and asphalt roofing manufacturing NESHAP.

2.3 DETERMINATION OF MACT

2.3.1 Overall Approach

Comment: One commenter (IV-D-11) expressed the belief that EPA incorrectly calculated the MACT floor for existing sources because only the performance of the lowest-emitting sources was considered rather than actual regulatory emission limitations. The commenter contended that the method for establishing the floors is inconsistent with Congress' intent regarding the information upon which floors are to be based according to the words "average emission limitation achieved" in section 112 (d)(3)(A) and (B) of the CAA.

The commenter explained that the term "emission limitation" is defined in section 302(k) of the CAA as "a requirement established by the state or the administrator..." so the phrase "average emission limitation achieved" must be read as "average state or federal requirement limiting emissions of a pollutant achieved." Accordingly, the commenter contended that the use

of the term "emission limitation" in section 112 (d)(3) rather than "emission level" or "emission control" was deliberate and intended to invoke the statutory definition. The commenter noted that the same paragraph states that the floor control for new sources "shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source..."

The commenter asserted that Congress' obvious intent was to base the MACT floor for new sources on the best actual degree of emission control achieved. The commenter noted that Congress did not instruct EPA to base the floor for existing sources on the average emission control achieved but on the emission limitation. The commenter argued that the choice of words is inexplicable unless Congress intended floors for existing sources to be based on regulatory requirements rather than emission control and cited Brown v. Gardner, 513 U.S. 115, 120 (1994). As further support, the commenter cited the legislative history of the CAA.

The commenter stated that the term "average emission limitation" first appeared in a Senate amendment to the CAA, contrasting with the language it replaced, which spoke of "emission level(s)" and "the level of control achieved by existing sources..." The commenter pointed out that the language was replaced by the Senate, and adopted by the House, while the language requiring "emission controls" as the basis for the floor for new sources was retained. The commenter recommended that EPA attribute significance to the substitution of the term "emission limitation" for earlier references to "emission levels" or "controls" and set the existing source MACT floor based on the actual emission limitations to which the best-performing facilities are subject.

Response: Several commenters made the legal argument that EPA could consider only regulatory limits, such as limitations in permits, in calculating MACT floors for existing sources in this rule (and any other MACT rule). The commenters base their argument on the term "emission limitation" in section 112 (d) (3), which is defined in section 302 (k) of the CAA as "a requirement established by the State or the Administrator which limits the quantity, rate, or continuous emissions of air pollutants on a continuous basis....". The EPA rejects the commenters' argument because it is inconsistent with the statutory text, legislative history, and statutory objectives, and because it is directly at odds with relevant case law. The statute, its history, and the relevant jurisprudence all indicate that MACT floors for existing sources must

reflect the actual performance of the best-performing sources. Permit limitations and other regulatory limits are relevant only insofar as they reflect this actual performance.

Statutory Text

Section 112 (d)(3)(A) indicates that MACT floors for existing sources must be based on the "average emission limitation achieved by the best performing [sources] ... (for which the Administrator has emissions information)." (Emphasis added.) This language obviously indicates that Congress wanted EPA to use whatever actual information it had on sources' actual emissions (i.e., actual performance) in establishing floors for existing sources. The commenters' argument is not only inconsistent with this natural reading, but would render key terms relating to sources' performance into surplusage, since information on performance would not be relevant if floors could only reflect regulatory limits.

The commenters' argument likewise makes into surplusage the later statement in section 112 (d)(3)(A) that EPA not consider the performance of "sources that have ... first achieved a level of emission rate or emission reduction which complies, or would comply if the source is not subject to such standard, with the lowest achievable emission rate ... applicable to the source category." The "lowest achievable emission rate" or "LAER" is a regulatory limit. There was no reason for Congress to refer to sources that would comply with LAER, if they were subject to it, if (as the commenters argue) one could base floors only on regulatory limits. If a source were not subject to LAER, it would not be subject to a regulatory limit, and therefore could not be considered anyway. On the other hand, Congress' directive not to consider such source's performance makes complete sense if one gives section 112 (d)(3) its natural meaning of referring to sources' actual performance.

Other provisions in the CAA confirm this interpretation. Notably, section 111, another technology-based provision and a direct antecedent for section 112 (see, for example, the cross-reference in section 112 (c)(1)), requires EPA to establish "standards of performance," defined in turn as standards which reflect "the degree of emission limitation achievable." This language is essentially identical to the command in section 112 (d)(3) for existing source floors to be based on the "average emission limitation achieved." Yet in the decades of implementation of section 111, no one (including the D.C. Circuit – see the first National Lime opinion) has suggested that these standards must be based on regulatory limits.

In fact, it is clear from context when Congress expected "emission limitation" to refer to regulatory limits, and when addition of a modifier (such as "achieved") indicate that Congress was using the term in a lay sense. Thus, in section 110 (a) (2), when Congress requires States to develop Implementation Plans to achieve primary national ambient air quality standards (NAAQS) and commands that such plans contain "enforceable emission limitations," it is clear that regulatory limits are intended. Section 111 (a) and 112 (d)(3), on the other hand, indicate by context that EPA is to evaluate sources' actual performance.

Legislative History

The legislative history to the existing source floor provision provides no support that Congress intended to limit EPA's consideration to permit conditions or other regulatory limits. All of the history is to the contrary. On the most basic level, the MACT provisions were enacted in the face of the failure of the previous risk-based regime to adequately control emission of HAP. The result was only a small handful of HAP were regulated at the federal level, and others might be addressed in a state permit implementing a SIP for random sources. Yet Congress mandated MACT standards for nearly 200 HAP in section 112 (b). It makes no sense to think that Congress intended there to be no floors for over 90 percent of the HAP for which it was mandating technology-based regulation. (As noted below, such a result would be illegal under National Lime II, as well.) The chief legislative history to the floor provision for existing sources consequently focuses on sources' actual performance, not on their permit limitations: "[s]ubsection (d)(3) provides a floor for existing source MACT. The standard may not be less stringent than the average of the emission levels achieved by the best-performing 12 percent of the existing sources within the category." 1 Legislative History at 870 (statement of Sen. Durenberger explaining the Conference Bill). See also legislative history to the parallel section 129 (MACT for municipal waste combustors), which notes that the parallel existing source provision for municipal waste combustors requires "the greatest degree of emission limitation achievable through application of best control technologies and practices, which either have been achieved in practice or are reflected in a state or local permit, whichever is more stringent." Quoted at 167 F. 3d at 662. Other legislative history, all consistent with the existing floor MACT having to be based on sources' actual performance, is traced in EPA's brief in Cement Kiln Recycling Coalition v. EPA, which is also part of this rulemaking record.

Relevant Jurisprudence

The D.C. Circuit has already ruled, in three separate cases, that MACT floors for existing sources must reflect the performance capabilities of the best performing sources, and that permit limitations can only be considered insofar as they are relevant to assessing that performance. Indeed, this is the precise holding in Sierra Club v. EPA, 167 F. 3d 657, 661-662 (D.C. Cir. 1999). See also the holding of Cement Kiln Recycling Coalition v. EPA, 255 F. 3d 855, 861 (D.C. Cir. 2001) ("EPA may not deviate from section [112 (d)(3)]'s requirement that floors reflect what the best performers actually achieve"). The entire focus of the court's discussion in National Lime v. EPA, 233 F. 3d 625, 632-633 (D.C. Cir.), likewise is on sources' actual performance, not on what limits might or might not appear in permits (see, e.g. id. at 632 ("EPA's method of setting floors must reasonably estimate the performance of the best performing plants ")). (All emphases added.) If the commenters' argument were correct, all of these cases have been decided incorrectly since actual performance is irrelevant because only regulatory limits may be considered. It is apparent, however, that it is the comment that is misplaced, not the jurisprudence.

It also should be noted that the commenters' argument leads to both illegal and absurd results. National Lime holds that EPA may not permissibly decline to establish floor standards for HAP (at least those that are controlled). 233 F. 3d at 634. Yet this is precisely the result that would follow if only regulatory limits could be used for establishing existing source floors, since there are virtually no existing regulatory standards for such HAP (this is why Congress enacted section 112 in the first place). Absurd results also would follow if permit limits are higher than actual performance. It could (and has) happened that permit limits are higher than the actual performance of any source, not just the best performing. Under the commenters' argument, the existing source floor would necessarily have to be higher than the actual level of performance of any source (even the worst-performing) in the category. There is nothing in section 112 (d)(3) suggesting that Congress would countenance such an absurd result. Moreover, as noted earlier, the D.C. Circuit has already stated that such a result would be illegal. (See Sierra Club, 167 F. 3d at 662, stating that permit limits, which were erroneously lenient (i.e., underestimated the degree to which sources could reduce emissions), could not permissibly be used in ascertaining MACT floor, since such permits would not reflect actual performance.)

2.3.2 Basis for MACT Floor Determination

Comment: One commenter (IV-D-11) expressed the belief that EPA's basic approach for selecting the MACT floor for new and existing sources is flawed because it is based on individual units and not overall facilities. The commenter explained that EPA ranked the best-performing and best-controlled types of equipment (for example, saturators, blowing stills, tanks, loading racks) rather than the best-performing asphalt processing facilities and roofing manufacturing facilities. The commenter stated that this approach results in the creation of hypothetical facilities upon which the floors are based and probably results in overly stringent floor levels. The commenter contended that it is clear from the statute and legislative history that the "best-performing" and "best-controlled" sources in a source category are to be real and not theoretical. The commenter argued that phrases such as "best-controlled" show that Congress intended the MACT floor to be based on actual sources operating under real life conditions. The commenter cited a Senate report on the 1990 CAA amendments the stated that Congress required "the selection of emissions limitations which have been achieved in practice (rather than those that are merely theoretical) by sources of a similar type or character. An emissions limitation achieved in practice is one based on control technology that works reasonable well (does not require frequent and extensive modification or repair) under realistic conditions." The commenter argued that, even if data were not available to establish either a mass emission limit or a percent reduction for entire affected source, as stated by EPA in the preamble to the proposed rule, this does not excuse a failure to select the best sources by examining the facility as a whole. The commenter suggested that floors could then be derived based on examination of the units found at these facilities.

Response: The commenter's main point is that the terms "best controlled similar source" and "best performing ...existing sources" in section 112 (d) (3) must be read to refer to entire plant-wide emissions, and therefore an approach that evaluates best performance on an emission point by emission point basis is legally impermissible. EPA disagrees. First, the statute does not speak to this precise point. Section 112 (d) applies to major sources of HAP, which are a type of "stationary source." (See section 112 (a) (1).) A "stationary source," for purposes of section 112, uses the same definition as in section 111 (a): "any building, structure, facility, or installation which emits or may emit any air pollutant." The terms "building," "structure," or

"installation" can easily encompass individual emission points rather than entire facilities. For example, loading racks are an example of a structure or an installation.

The Agency's reading strongly promotes the ultimate policy objective of section 112 (d) (2), namely, to "require the maximum degree of reduction in emissions of [HAP] .....achievable," whereas the commenter's reading would often thwart this object by leading to floors reflecting least common denominator means of control. For example, suppose asphalt plants have eight emission points, and 12 percent of the industry controls four of those points, and another 12 percent controls the other four emission points. On a total facility basis, the floor would (or could) be no control, whereas the Agency's approach would base the floor on the controls used by the best sources for each emission point, consistent with the ultimate statutory object.

The commenter's approach also could lead to one-plant categories in industries where there is variation in exact plant configuration. This again would thwart the object of maximum control of HAP emissions, because it would lead to each plant being considered best-performing for purposes of floor analysis.

The legislative history cited by the commenter also does not appear to be on point. It refers, like the statute, to maximizing emission reductions through the use of optimized means of control. As just explained, an approach like EPA's which examines emission points separately to see which are the best-controlled furthers this statutory objective far better than an approach which looks to entire plants, and thus likely excludes well-controlled individual emission points from consideration in establishing floors.

It also should be noted that the commenter's argument has already been rejected in the context of the analogous technology-based provisions of sections 304 and 307 of the Clean Water Act (controlling discharge of toxics to navigable waters and to Publically Owned Treatment Works), on which the air toxics provisions of the Clean Air Act are substantially modeled. (See, for example, Remarks of Senator Durenberger, 136 Cong. Rec. S 516 (January 30, 1990) and Chemical Manufacturers Association v. EPA, 885 F. 2d at 264 (upholding technology-based standards based on best performance for each pollutant by different plants, where at least one plant met each of the limitations but no single plant met all of them, and stating "the fact that no plant has been shown to be able to meet all of the limitations does not demonstrate that all the limitations are not achievable."))

Given the ambiguity in the statutory definitions, an affected source may be an entire facility, a kind of emission point, or a collection of emission points. The definition chosen for each MACT standard is dependent on the characteristics of the industry being regulated and the information available to characterized the source category. The EPA has chosen to define source in the asphalt processing and asphalt roofing manufacturing industry as a collection of emission points. The level of the MACT floor was then determined for each emission point. This approach is consistent with the approach used for similar sources in the petroleum refineries (40 CFR 63, subpart CC) and hazardous organic NESHAP (40 CFR 63, subparts F, G, and H), among many examples. The EPA elected to determine the MACT floor on a "per unit" basis, in part, because sufficient information was not available to determine the MACT floor on a facility basis. Computing emission levels or percent reductions for the whole facility would require accurate site-specific data of the emission levels of each process at each facility being regulated. Nor is such an approach compelled, or often even appropriate, as explained above.

The commenter suggested that EPA could have examined facilities as a whole, determined the best-performing, and based the floor on units at those facilities. While EPA contends that the approach used to determine the floor was appropriate for this rulemaking, EPA did examine available data and qualitatively identified the best-performing facilities. For example, a facility controlling all of its emission equipment with a thermal oxidizer would be considered better controlled than a facility that uses a combination of thermal oxidizers and PM control devices. The best-performing facilities, based on this analysis, have the control devices in place that are the basis for the MACT floor. The fact that there are existing facilities that have the control devices that are the basis for the MACT floor refutes the commenter's assertion that the MACT floor approach results in hypothetical facilities and an overly stringent floor.

However, if some technical impediment prevents sources from achieving a standard which is established on an emission point-by-emission point basis, then there would have to be some adjustment to the approach. However, no commenter suggested any such type of achievability concern here, nor is EPA aware of any engineering reason that the standards are either unachievable, or that control of any regulated emission point at asphalt processing and roofing manufacturing facilities makes control of another emission point infeasible, or even more difficult.

2.3.3 Petroleum Refineries

2.3.3.1 Petroleum Refinery Processes vs. Asphalt Roofing Manufacturing Processes

Comment: Two commenters (IV-D-07; IV-D-25) stated that refinery asphalt processing plants should be a separate subcategory because they are a separate class. The commenters contended that refineries are different than roofing manufacturing plants. One commenter (IV-D-07) noted EPA has provided no data to support the premise that refinery processing plants are the same as roofing manufacturing plants. The commenter also argued that refineries include many non-asphalt processes and do not have many of the operations found at roofing plants such as coaters and sealant applicators .

Response: Obviously, petroleum refineries are different than roofing manufacturing facilities. However, petroleum refineries could be affected by this rule because they can contain asphalt processing facilities, which are a separate source category than asphalt roofing manufacturing facilities. The processing of asphalt is technically the same regardless of where it occurs in that the same HAP compounds are generated in the same concentrations and the HAP generated by asphalt processing are amenable to the same means of control. Regarding the commenter's perceived consolidation of processing and roofing manufacturing, EPA assured during its MACT analysis (documented in the record to this rule) that asphalt processing was analyzed apart from emissions from other source categories.

The EPA determined the MACT for asphalt processing operations based on individual pieces of equipment found at processing facilities: blowing stills, asphalt storage tanks, and asphalt loading racks. Because this equipment (with the exception of asphalt storage tanks) does not overlap with the equipment used at asphalt roofing manufacturing operations, the data for asphalt roofing manufacturing equipment were not used to establish the standards for asphalt processing operations. For asphalt storage tanks, the level of MACT was the same regardless of the type of facility or material grouping used in the determination. Therefore, the fact that asphalt roofing manufacturing facilities have different equipment than asphalt processing facilities is reflected in the rule, with different standards developed for asphalt processing and asphalt roofing manufacturing.

2.3.3.2 Petroleum Refinery Costs

Comment: One commenter (IV-D-10) stated that the characteristics of emissions from storage tanks and loading racks and their distance to existing thermal oxidizers would make it technically difficult and prohibitively expensive to vent them to an existing thermal oxidizer and disagreed with EPA's assumption that control costs would be insignificant for petroleum refineries. One commenter (IV-D-16) pointed out that requiring petroleum refineries to install costly controls for minimum benefit might have the effect of driving refineries out of the asphalt blowing business, only to have the refiners sell asphalt flux to independent processors who might not be major sources and would therefore not be required to install control devices.

Two commenters (IV-D-07; IV-D-25) said that refineries are generally more spread out than roofing plants and installing capture systems, particularly for storage tanks and loading racks, would require piping over significant distances. Another commenter (IV-D-03) stated that because tanks and loading racks are typically located several hundred yards or more from combustion devices, the related piping cost would be very expensive and may involve road crossings and other obstacles. Two commenters (IV-D-16; IV-D-25) stated that locating combustion devices close to storage tanks raises safety concerns.

Additionally, two commenters (IV-D-07; IV-D-10) noted that, because of the long piping distances, steam jacketing or steam tracing may be necessary to prevent mist from condensing and fouling the pipes. One commenter (IV-D-10) asserted that the installed cost of the heat-traced and insulated vent line would likely exceed $100 per foot. The commenter estimated that thousands of feet of pipeline would be needed to connect multiple tanks and loading racks to a control device. Another commenter (IV-D-03) stated that, by applying a vacuum to storage tanks and loading rack vents, there is a potential to introduce asphalt particulates into the vent stream that would cause plugging problems in the vapor recovery system, particularly in an existing compression unit, which is not designed to operate in particulate service. Two commenters (IV-D-07; IV-D-03) noted that the capture system would contain a significant amount of air, possibly making it necessary to purge lines continuously with natural gas or steam to avoid an explosive mixture. One commenter (IV-D-03) stated that, to route the vents to an existing combustion device, the vent stream must be compressed to capture system pressure

which would require installation of a expensive compressor, blower, or liquid ring vacuum equipment.

One commenter (IV-D-10) estimated that the installed cost of two new thermal oxidizers for loading racks and storage tanks to be $500,000, which does not include the emissions gathering system. The commenter provided that the installed cost of a thermal oxidizer to control a blowing still was $2,000,000 in 1989. Another commenter (IV-D-07) contended that installing control devices within tank farms would conflict with safety practices.

One commenter (IV-D-3) concluded that, considering safety and technical concerns, high cost, and the minor amount of emissions, oxidized asphalt loading racks and storage tanks at refineries should be removed from the source category. Another commenter (IV-D-10; IV-D-15) stated that controlling the small amount of HAP from storage tanks and loading racks is not warranted considering the technical difficulties and high costs. The commenter questioned whether controlling emissions from storage tanks and loading racks would meet commonly accepted cost-effectiveness thresholds.

One commenter (IV-D-07) a representative of U.S. refiners, said that they surveyed petroleum refineries and did not find any facilities that are routing emissions from storage tanks or loading racks to a control device. The commenter stated that they have found no refineries that have controls on asphalt storage tanks and loading racks other than those required by NSPS subpart UU. The commenter pointed out that EPA has not provided any data on controls of asphalt storage tanks at refineries. Another commenter (IV-D-03) stated that the tanks and loading racks associated with asphalt processing at their two refineries are not controlled. Another commenter (IV-D-19) stated that emissions from their three blowing stills are controlled with a single fume incinerator/boiler and there are no controls on their storage tanks and loading racks for blown asphalt products and flux. One commenter (IV-D-10; IV-D-15) noted that the asphalt storage tanks and loading racks at their refinery are not equipped with combustion-based controls and, based on their knowledge of other facilities, thermal oxidizers do not represent the MACT floor for loading racks and storage tanks at petroleum refineries. The commenter contended that if petroleum refineries are appropriately examined as a subcategory, the MACT floor for loading racks and storage tanks would be no control.

Two commenters (IV-D-10; IV-D-15) stated that combustion-based controls are not appropriate for asphalt storage tanks and loading racks located in petroleum refineries because they are insignificant emission sources. One commenter (IV-D-15) noted that the preamble to the proposed NESHAP stated that asphalt storage tanks have low vapor pressure, on the order of 0.4 psia or 2.8 kPa. The commenter stated that such vapor pressures are below the 10.4 kPa threshold established for storage tanks in the petroleum refineries NESHAP. The commenter argued that, if the proposed controls for storage vessels and loading racks are promulgated, refineries would be required to install expensive controls on asphalt equipment with a lower potential for HAP emissions than other refinery sources for which similar controls have been deemed unnecessary. The commenter concluded that the definitions of "asphalt storage tank" and "asphalt loading rack" should be revised to specifically exclude facilities that store of transfer asphalt with a vapor pressure less than 10.4 kPa.

Response: The EPA contends that there is no justification for considering asphalt processing at petroleum refineries to be a separate subcategory. The feedstocks, process, and equipment used are the same at refineries as at non-refinery asphalt processing facilities. The same HAP are emitted in the same concentrations, and the means of optimized control of these emissions are also the same. Thus, subcategorization is inappropriate because the refinery/non-refinery division is a distinction without a difference: location at a petroleum refinery does not affect HAP emissions from asphalt processing operations, their means of control, or the degree to which they can be controlled. Therefore, it is appropriate to retain a single unsubcategorized source category, and to establish a single MACT floor for both refinery and non-refinery asphalt processing.

Prior to proposal of the regulation, EPA had limited data on asphalt storage tanks and loading racks at petroleum refineries from surveys collected during development of the petroleum refinery MACT standard. These survey responses indicated that 67 percent of the asphalt storage tanks at petroleum refineries were controlled to reduce emissions by 95 percent (presumably with a thermal oxidizer). Although the commenters have stated that none of the asphalt storage vessels or loading racks at petroleum refineries are controlled, no additional data was provided to EPA to support the commenters' assertion. However, EPA has revised the cost estimate for complying with the regulation to include the control of asphalt storage tanks and

loading racks at petroleum refineries (see section 2.10). The EPA has also revised the applicability for asphalt storage tank and loading rack control requirements to include a vapor pressure cutoff (discussed in section 2.3.4.2).

With regard to the costs associated with controlling storage vessels and loading racks, EPA appreciates the commenter's information but notes that control costs are not a consideration in determining the MACT floor, which is the control level EPA has adopted for asphalt storage vessels. National Lime v. EPA, 233 F. 3d at 640.

2.3.3.3 Petroleum Refinery Data

Comment: One commenter (IV-D-07), a representative of U.S. refiners, complained EPA did not contact them to obtain data concerning asphalt processing at refineries. Another commenter (IV-D-14) estimated that, contrary to the eight estimated by EPA, there are over 70 asphalt processing facilities associated with petroleum refineries in the United States. The commenter asserted that EPA has therefore only assessed 11 percent (8/70) of the potentially affected facilities. The commenter added that refineries represent only approximately 13 percent of asphalt capacity in the United States. The commenter informed EPA that they operate five asphalt manufacturing facilities, of which four have blowing stills. The commenter was not sure if the high percentage of locations with blowing stills is representative of the entire industry, but noted that even if 25 to 50 percent of the 70 facilities have blowing stills, 10 to 30 facilities were not accounted for by EPA.

Response: Prior to proposal, EPA contacted the American Petroleum Institute (API), another representative of refiners requesting information, but no response was provided. The EPA has the following information for refineries: identification of refineries that oxidize asphalt; the number of blowing stills; general control status of blowing stills (uncontrolled or controlled with incineration or other combustion device); blowing still exhaust rates and temperatures. The EPA does not believe that data are needed on all refinery facilities that produce asphalt, only those with blowing stills. Based on the commenter's estimate, EPA has data on 23 to 46 percent of refineries with blowing stills. The EPA has received additional information on petroleum refineries with asphalt processing through comments and follow-up to

comments. However, this additional information has not changed any of the MACT determinations.

2.3.3.4 Representation of Petroleum Refineries

Comment: One commenter (IV-D-14) contended that the data EPA used to determine the MACT floor for blowing stills, loading racks and storage vessels is not representative of the petroleum refinery industry. The commenter argued that EPA sampled a limited number of refinery-based facilities (see previous comment) and that the list of facility operators is not representative. The commenter explained that out of the 14 facilities EPA sampled in their economic evaluation: (1) nine are owned by two companies; (2) all six from the roofing manufacturing category are owned by Owens Corning; and (3) of the eight petroleum refinery-based facilities, three are owned by Marathon Ashland. The commenter informed EPA that Marathon Ashland operates 5 of the 70 refinery-based asphalt manufacturing facilities. The commenter contended that facilities owned by the same company are likely to have similar technology and emissions control equipment and argued that the sample is not representative. The commenter argued that the MACT floor determination does not meet the requirements of section 112 (d)(3)(A) of the CAA.

Response: The commenter misunderstood EPA's approach to determining the MACT floor. The EPA used data on 61 non-refining facilities owned by 11 parent companies, in addition to the limited data available for refinery-based asphalt processing, to determine the MACT floor. The MACT floor analysis was not limited to the facilities included in the economic evaluation. After determining the level of the standard, EPA performed an evaluation to determine the economic impact of the proposed NESHAP. Because the NESHAP will only apply to major sources of HAP emissions, the economic evaluation for the proposed NESHAP included only those facilities estimated at the time by EPA to be major. The major sources are the basis for the economic evaluation, not the MACT floor determination.

2.3.4 Storage tanks and loading racks

2.3.4.1 Consideration of Low HAP Emissions

Comment: Several commenters (IV-D-03; IV-D-04; IV-D-07; IV-D-08; IV-D-09; IV-D-11; IV-D-12) objected to requirements to control emissions from tanks and loading racks, citing low HAP emissions due to the low vapor pressure of asphalt and high control costs relative to the amount of HAP controlled as reasons for why control should not be required. One commenter (IV-D-25) stated that requiring asphalt storage tanks, known to be low vapor pressure and very low HAP emitters, to be subject to emission reduction requirements comparable to those that apply to high vapor pressure, high HAP concentration stocks would be incongruous.

Two commenters (IV-D-07; IV-D-03) stated that HAP emissions from asphalt tanks and loading racks are expected to be very low and account for a small fraction of HAP emissions compared to blowing stills. One commenter (IV-D-07) based this statement on estimates provided by EPA in support of the petroleum refineries NESHAP. One commenter (IV-D-03) provided the following emission estimates (in tons per year) for asphalt processing facilities at two of their petroleum refineries:

Canton Refinery

Blowing still (AP-42 factor, uncontrolled) =18,990

Blowing still with afterburner (stack test) = 0.3942

Tanks (uncontrolled) = 0.053

Loading racks (uncontrolled) = 0.105

Catlettsburg Refinery

Blowing still (AP-42 factor, uncontrolled)= 28,920

Blowing still with afterburner (stack test) = 0.5996

Tanks (uncontrolled) = 0.2

Loading racks (uncontrolled) = 0.0554

The commenter noted that emissions from blowing stills far exceed emissions from tanks and racks. No supporting information (e.g., calculations, raw data) was submitted with the emission estimates.

Another commenter (IV-D-10) stated that loading racks and storage tanks emit insignificant amounts of HAP and controlling them would produce no discernable environmental benefit and would not be cost-effective. The commenter speculated that controlling loading racks and storage tanks at petroleum refineries would represent an insignificant portion of total HAP reduction. The commenter presumed that most of the volatile organic compounds (VOC) and corresponding HAP present in asphalt would be stripped in the blowing still, therefore, oxidized asphalt arriving at storage and loading racks would have reduced potential to emit HAP. The commenter noted that EPA's analysis acknowledged that asphalt in storage tanks would exhibit very low vapor pressure and concluded that it would be a *de minimis* source of HAP emissions. One commenter (IV-D-10) pointed out that, under new source performance standards, refiners are allowed to store organic liquids with vapor pressures up to 0.75 pounds per square inch absolute (psia) in uncontrolled tanks. The commenter asked that the anticipated HAP emission reductions that would be achieved be quantified and that an incremental control cost analysis be completed before EPA concludes that combustion-based controls are warranted for asphalt storage tanks and loading racks at petroleum refineries.

One commenter (IV-D-11) estimated that controlling a tank storing a liquid with a true vapor pressure of 10.3 kiloPascals (kPa) would cost $442,400 per ton of HAP (details on emission and costs estimates are provided in appendix B of the comments). One commenter (IV-D-07) argued that the CAA specifies that regulations must reflect the maximum degree of reduction in emissions of HAP that is achievable taking into consideration the cost of achieving the emission reduction and that tanks and loading racks are minor sources of HAP emissions that will not justify the cost of controls. Another commenter (IV-D-08) stated that the dilute gas streams from these sources cannot be readily combusted to achieve a 95 percent emission reduction.

Response: The control requirements for asphalt storage tanks and loading racks are based on the MACT floor (hence comments regarding cost are not legally relevant, since costs may not be considered in establishing floors). Survey data showed that 23 percent of the storage vessels and 31 percent of the loading racks are being controlled with thermal oxidizers operating at a minimum temperature of 1200 ^{o}F. However, EPA agrees that the vapor pressure (and HAP emissions) from asphalt storage tanks and loading racks are a function of temperature, with

increased emission rates at higher storage temperatures. To address this issue, EPA has incorporated a vapor pressure cutoff for determining the control applicability of asphalt storage tanks and loading racks. Development of the vapor pressure cutoff is discussed in the response to the following comment.

2.3.4.2 Vapor Pressure Applicability Cutoff

Comment: One commenter (IV-D-07) asserted that precedents established by previous rulemakings do not support requiring controls on tanks and loading racks. The commenter pointed to the control applicability cutoffs of 5.2 kPa (0.75 psia) in the petroleum refineries NESHAP and 1.5 psia (10.3 kPa) in the storage vessel NSPS (40 CFR part 60, subparts K, Ka, and Kb). The commenter stated that most asphalt storage tanks would not be required to be controlled based on these cutoffs. Another commenter (IV-D-10) asked that EPA address this inconsistency between the proposed NESHAP and the storage vessel NSPS.

Several commenters (IV-D-08; IV-D-09; IV-D-11; IV-D-12; IV-D-28; IV-D-27) supported using the vapor pressure cutoff of 10.3 kPa (1.5 psia) based on the storage vessel NSPS subpart Ka. Three commenters (IV-D-09; IV-D-11; IV-D-12) contended that, if the vapor pressure does not reach this threshold value, there should be little concern about volatile HAP emissions.

Two commenters (IV-D-11; IV-D-12) noted that the preamble to the proposed rule stated that it is unlikely that the vapor pressure of asphalt would trigger petroleum refineries NESHAP control requirements. Several commenters (IV-D-11; IV-D-12; IV-D-28; IV-D-27) pointed out that the 10.3 kPa cutoff (of the NSPS) would be almost identical to the 10.4 kPa threshold that EPA established for existing storage vessels subject to the petroleum refineries NESHAP. One commenter (IV-D-14) asserted that it is important for MACT requirements to be applied consistently, particularly for asphalt processing facilities at petroleum refineries. The commenter pointed out that, if the proposed rule is adopted, facilities that operate an asphalt blowing still will be required to install expensive combustion controls for emissions from asphalt tanks determined to be *de minimis* under the petroleum refineries NESHAP. The commenter noted that facilities without blowing stills handling identical hydrocarbon streams will not require similar controls.

Three commenters (IV-D-14; IV-D-27; IV-D-25; IV-D-28) suggested that EPA adopt the same control applicability criteria for storage vessels used in the petroleum refineries NESHAP, which include maximum and annual average true vapor pressures and maximum and average HAP concentrations. One commenter (IV-D-14) cited an excerpt from the petroleum refineries NESHAP Background Information Document (BID) in support of this approach. The excerpt specifically mentions asphalt as a material that has minimal HAP, but may have a vapor pressure greater than 10.4 kPa (1.5 psia) when stored at elevated temperatures. One commenter (IV-D-28) suggested that the vapor pressure criteria for storage vessels from the petroleum refineries should also apply to loading racks while another commenter (IV-D-25) suggested that the vapor pressure and HAP concentration applicability criteria apply. Another commenter (IV-D-27) argued that the vapor pressure and HAP concentration cutoffs should apply to tanks and loading racks because tanks and loading racks falling below that thresholds would emit only minimal amounts of HAP and therefore should not be subject to control requirements. One commenter (IV-D-14,) asserted that EPA should not simultaneously declare emissions from low HAP, low vapor pressure stocks as *de minimis* sources under the petroleum refineries NESHAP and then propose to regulate them under the asphalt NESHAP. One commenter (IV-D-25) contended that it is reasonable to use an approach similar to the petroleum refinery NESHAP because asphalt flux feedstocks and finished asphalt products are produced directly from refineries and because many refineries will be subject to the asphalt NESHAP.

Three commenters (IV-D-09; IV-D-11; IV-D-12) asserted that the same basic principles regarding applicability thresholds for storage tanks apply to loading racks, explaining that if the vapor pressure on the loading racks is low, volatile emissions will also be low. The commenters contended that it would not be cost-effective to route these low emissions to a thermal oxidizer, particularly because it may require extensive and costly ductwork. Two commenters (IV-D-11; IV-D-13) referred to the published paper *Estimates of Air Emissions from Asphalt Storage Tanks and Truck Loading*, David C. Trumbore, Environmental Progress, Vol. 18, No.4 at 250 (Winter 1999) which was also included in an appendix to comment letter IV-D-11. One commenter (IV-D-13) stated that, using the emission estimating techniques referenced in the paper, it is reasonable to conclude that only a very low level of HAP is emitted from low vapor pressure, low temperature asphalt storage tanks and loading racks. The commenter concluded that

excluding such low level HAP sources from the proposed NESHAP would allow the regulated community to focus its resources on the higher level HAP sources that MACT standards are intended to regulate.

Two commenters (IV-D-11; IV-D-12) stated that applying controls to loading racks with low vapor pressure might actually increase volatile emissions because the increased air flow associated with the controls could lead to greater volatilization. The commenters (IV-D-09; IV-D-11; IV-D-12) concluded that the proposed rule should be modified so that only loading racks with a true vapor pressure of 1.5 psia are subject to control requirements.

One commenter (IV-D-08) stated that exempting low vapor pressure from the regulation will not impact EPA's goal of significantly reducing HAP emissions from asphalt roofing and processing because HAP emissions are related to vapor pressure. Two commenters (IV-D-26; IV-D-27) contended that the CAA does not compel EPA to determine the MACT floor for units that have low HAP emissions. Several other commenters (IV-D-09; IV-D-11; IV-D-12; IV-D-26) argued that EPA has discretion not to regulate units and processes with *de minimis* or low HAP emissions and has done so often in other MACT rulemakings. One commenter (IV-D-11) cited the fact that EPA did not require controls for all emission sources of HAP at organic chemical plants, petroleum refineries, and many other types of industry sources regulated under MACT standards as an example. Two commenters (IV-D-26; IV-D-27) stated that in all or nearly all MACT rulemakings, EPA decides which types of emissions are worth regulating and then calculates MACT floors only for those units. The commenters contended that it is not necessary to set a MACT floor for particular units merely because some of those units are controlled. One commenter (IV-D-12) stated that deciding not to establish standards for low-emitting units is particularly appropriate when control costs are high. One commenter (IV-D-28) suggested that EPA should use the same approach used for the petroleum refineries NESHAP, using its discretion to target controls to operations where significant reductions in emissions could reasonably be achieved.

Response: The proposed MACT for storage tanks at existing, new, and reconstructed affected sources was based on the observation that greater than 12 percent of the asphalt storage tanks were controlled with a combustion device operating at or above 1200^{o}F. We found that, regardless of the facility or material grouping, more than 12 percent of the tanks were controlled.

Also, the available data showed that no sources were using a combustion device to control emissions from storage tanks with a capacity less than 1.93 megagrams of asphalt. Therefore, the proposed MACT did not include controlling tanks with capacities less than 1.93 megagrams.

The EPA now believes that the prevalence of combustion devices on tanks storing low-vapor pressure asphalt is misleading. We believe that combustion devices in this industry are used to control emissions from both high-vapor pressure storage tanks and low-vapor pressure storage tanks that are generally part of an "integrated system." An integrated system is one in which process components (e.g., tanks storing high- and low-vapor pressure asphalt and blowing stills) are utilized largely together and are generally located in close proximity. In an integrated system, emissions from process equipment that are subject to less stringent emission standards (e.g., tanks storing low-vapor pressure asphalt) generally are routed to the control device (e.g., combustion device) that is used to control emissions from the equipment (e.g., blowing stills, coaters) that are subject to more stringent emission standards. In other words, it is more cost-effective to "over control" emissions from lower-emitting storage tanks by using a combustion device that is selected and designed to control emissions from the entire system (e.g., blowing stills, coaters, and asphalt storage tanks) than it is to install a separate control device to reduce emissions from the storage tanks to a lesser degree. In absence of an integrated system configuration, we do not believe that combustion controls represent the MACT for tanks that store low-vapor pressure asphalt since facilities that do not use a combustion device to reduce emissions from higher-emitting process equipment are unlikely to use a combustion device to reduce emissions from tanks that store low-vapor pressure asphalt. Therefore, for tanks storing asphalt with a low vapor pressure, the MACT floor largely depends on whether or not the tank is part of an integrated system.

Based on the above, it would seem logical to develop one set of standards for integrated systems (including tanks), and another for non-integrated systems (where tanks would have different standards). However, we do not have sufficient data to characterize the control level of integrated versus nonintegrated systems or even to devise workable definitions of these systems. The significance of the existence of integrated systems, therefore, relates to calculation of floor standards for tanks. Based on the existence of integrated systems, we do not believe that we have to include all high and low vapor pressure storage tanks together in making a floor

determination for storage tanks. We do believe that it is reasonable to assume that facilities would use combustion devices for high-vapor pressure storage tanks because of the greater potential for emissions from these tanks and the appropriateness of controlling volatile emissions using combustion devices. We thus included all such tanks as a single group in determining floor standards, and determined that the best-performing 12 percent of tanks used to store high-vapor pressure asphalt use combustion to control the emissions. (We did not, however, include tanks used to store low-vapor pressure asphalt in this calculus, and are not compelled to for the reasons explained above relating to integrated systems.) Therefore, for tanks storing asphalt with a high vapor pressure at existing and new sources, we believe that the MACT floor is a combustion device regardless of whether or not it is located in an integrated system.

For tanks storing low-vapor pressure asphalt, a separate determination must be made to establish the MACT floor for existing and new sources. For these tanks, the MACT floor depends mainly on whether or not the tank is part of an integrated system. However, as noted above, we are unable to devise a workable definition of the integrated system. Among other problems, we have no information regarding tank vapor pressure or facility layouts to determine the relative proximity of low-vapor pressure storage tanks to combustion devices. Although we are unable to develop a separate standard for integrated systems, the MACT floor for any storage tank cannot be less stringent than the PM emission limits specified in the asphalt NSPS, since over 12 percent of existing storage tanks in the industry are already subject to this standard. In fact, approximately 27 percent of the storage tanks in the database use particulate controls (such as, fiber-bed filters, mist eliminators, condensers) to meet the asphalt NSPS. This control of PM also will control HAP emissions since a portion of the PM is condensed HAP. Therefore, the MACT floor for tanks storing asphalt with low vapor pressures is the PM emission limit specified in the asphalt NSPS.

We recognize that this floor for tanks storing low-vapor pressure asphalt actually applies to some tanks that are part of integrated systems. Nevertheless, we expect that, at least most of the time, a tank that is part of an integrated system will be controlled by the same control device used to control the entire system, because it already makes economic sense to do so. Therefore, using the PM emission limit specified in the asphalt NSPS as a floor for tanks storing asphalt with low vapor pressures should not discourage facilities from using combustion devices to

control emissions from storage tanks that are part of integrated systems. Nor is it likely to lead to removal of any existing controls on integrated systems since the combined system was already adopted by those facilities and removal would entail retrofit costs.

With regard to establishing the vapor pressure cutoff value that would be used to assign tanks into high- and low-vapor pressure groups (Groups I and II, respectively), EPA does not have survey data for the vapor pressure of stored asphalt that could be used to establish this value. In the absence of vapor pressure data, we based the vapor pressure cutoff value on the MACT floor for existing storage tanks at petroleum refineries. Asphalt tanks are similar because asphalt is a petroleum refinery product, and asphalt processing facilities are located at petroleum refineries. (Indeed, this was the commenters' main point in urging EPA to be consistent between the petroleum and asphalt MACT standards.) Therefore, EPA believes that it is reasonable for the vapor pressure cutoff in the final rule to be consistent with the maximum true vapor pressure cutoff (10.4 kPa) for existing storage tanks in the petroleum refinery NESHAP. Thus, under today's rule, tanks storing asphalt with a maximum true vapor pressure of 10.4 kPa or greater would be considered high-vapor pressure tanks while tanks storing asphalt with a maximum true vapor pressure less than 10.4 kPa would be considered low-vapor pressure tanks.

The petroleum refinery NESHAP also contains an annual average true vapor pressure cutoff (8.3 kPa) and an annual HAP liquid concentration cutoff (four percent, by weight total organic HAP) for determining storage tank applicability. Because the storage temperature of asphalt at asphalt processing and asphalt roofing manufacturing facilities is expected to be maintained over a narrow range throughout the year, providing an annual average for storage temperature in this final NESHAP is unnecessary. The concentration cutoff was included in the petroleum refinery NESHAP to address the fact that some liquids at petroleum refineries have very low HAP concentrations and high vapor pressures due to the volatility of non-HAP compounds in the material. However, because asphalt processing and asphalt roofing manufacturing facilities do not typically store products other than asphalt, EPA believes that including an annual HAP liquid concentration cutoff in the asphalt NESHAP is unnecessary.

With regard to the proposed tank capacity cutoff of 1.93 Mg (1.84 cubic meters), EPA believes that the analysis used to establish the capacity cutoff for combustion control was flawed since the cutoff value was based on the smallest tank controlled by a combustion device. Since

we now consider the seeming prevalence of combustion devices on low-vapor pressure storage tanks to actually reflect controls on integrated systems (driven by the need to control the dominant emitter of the integrated system), we do not believe that the proposed capacity cutoff value for combustion control is valid because it was premised on the assumption that stand-alone (i.e., non-integrated) low-vapor pressure storage tanks were controlled by means of combustion devices. Consequently, we are revising the capacity cutoff value for combustion control to be consistent with the capacity cutoff for existing tanks at petroleum refineries (again consistent with comments urging that the petroleum and asphalt NESHAP be consistent insofar as they apply to similar types of emitting sources).

Therefore, the floor for asphalt storage tanks with capacities of 177 cubic meters or greater and storing asphalt with a maximum vapor pressure of 10.4 kPa or greater at existing and new sources is combustion control. The floor for asphalt storage tanks with capacities of 177 cubic meters or greater storing asphalt with a maximum vapor pressure less than 10.4 kPa at existing and new sources is the PM emission limit specified in the asphalt NSPS. As at proposal, however, we are not determining a floor level of control for tanks less than a capacity of 1.93 Mg (1.84 cubic meters). Based on the tank capacity data from the ARMA survey, less than two percent of the tanks have capacities less than 1.93 Mg and only one of those tanks is vented to a PM control device.

The EPA is also applying much this same reasoning in determining a MACT floor for asphalt loading racks. The proposed MACT for asphalt loading racks at existing, new, and reconstructed affected sources was based on the fact that greater than 12 percent of the loading racks were controlled with a combustion device operating at or above 1200 ^{o}F. Although we do not have vapor pressure data for loading racks, we believe (as with storage tanks) that it is reasonable to assume that facilities are using combustion devices to control emissions from loading racks that are used to transfer high-vapor pressure asphalt because of the greater potential for emissions from this asphalt and the appropriateness of controlling volatile emissions using combustion devices. Consequently, EPA believes that the MACT floor for loading racks transferring high-vapor pressure asphalt at existing and new sources is a combustion device regardless of whether or not it is part of an integrated system. In the absence of vapor pressure data, and to be consistent with the approach used for high-vapor pressure asphalt storage tanks,

we based the vapor pressure cutoff for loading asphalt racks on the maximum true vapor pressure cutoff (10.4 kPa) for existing storage tanks in the petroleum refinery NESHAP.

For loading racks used to transfer low-vapor pressure asphalt at existing and new sources, as with low-vapor pressure asphalt storage tanks, we are unable to develop a separate standard for integrated systems. However, unlike the asphalt NSPS for storage tanks, an existing regulation does not exist for asphalt loading racks that would establish a minimum level of the MACT floor. Therefore, a MACT floor for loading racks transferring asphalt with a maximum vapor pressure less than 10.4 kPa at existing and new sources could not be established.

In summary, the MACT floor for tanks with asphalt storage capacities of 177 cubic meters or greater and storing asphalt with a maximum vapor pressure of 10.4 kPa or greater at existing and new sources is based on a combustion device operating at or above 1200 ^{o}F. For tanks with asphalt storage capacities of 177 cubic meters or greater and storing asphalt with a maximum vapor pressure less than 10.4 kPa, the MACT floor for existing and new sources is represented by the PM emission limit (opacity limit) in the asphalt NSPS. The PM emission limit of the asphalt NSPS also represents the MACT floor for asphalt storage tanks with capacities less than 177 cubic meters but greater than or equal to 1.84 cubic meters at existing and new sources. For loading racks used to transfer asphalt with a maximum vapor pressure of 10.4 kPa or greater, the MACT floor is a combustion device operating at or above 1200 ^{o}F. The MACT floor for loading racks used to transfer asphalt with a maximum vapor pressure less than 10.4 kPa at existing and new sources is no additional control. Also, as explained in detail in the preamble to the proposal (66 FR 58620-21), we continue to believe that controls beyond the MACT floor for high-vapor pressure asphalt storage tanks and loading racks (where the floors have not changed between the proposed and final rule) are not technically or economically feasible (i.e., there are no known controls that would reduce HAP emissions more than combustion control), so that MACT for the high-vapor pressure asphalt storage tanks and loading racks is represented by their respective MACT floors.

For the low-vapor pressure asphalt storage tanks (for which we have made a different floor determination), the only control option beyond the MACT floor is control with a combustion device. However, given the relatively low HAP emissions from this equipment, the incremental cost-effectiveness (greater than $3,000,000 per megagram of HAP reduced) of

increasing the level of HAP reduction achieved by a PM control device (93.3 percent) (the device we anticipate would be used to achieve the opacity standard which is the MACT floor) to that achieved by a combustion device (95 percent) is not a justifiable option. (Additional energy use likewise would be required to achieve this modest incremental HAP reduction as well.) Therefore, MACT for low-vapor pressure asphalt storage tanks is represented by the MACT floor.

For low-vapor pressure asphalt loading racks, the control options beyond the MACT floor are a PM control device and a combustion device. However, as with low-vapor pressure asphalt storage tanks, the high costs per megagram of HAP reduction (greater than $500,000 per megagram of HAP reduced) achieved by controlling low-vapor pressure asphalt loading rack emissions with either a PM control device or combustion device make the beyond the MACT floor options economically infeasible. Therefore, MACT for low-vapor pressure asphalt loading racks is represented by the MACT floor.

Vapor Pressure Determination

Because we are specifying vapor pressure as a cutoff for different groups of tanks, it is necessary to identify how such a determination would be made if a facility were required to do so. Following proposal, EPA met with industry representatives to identify an appropriate test method for determining the vapor pressure of stored asphalt. According to the industry and EPA representatives, a standardized or consensus test method for measuring the vapor pressure of stored asphalt has not been established. (See the summary of the September 17, 2002 meeting with petroleum refinery representatives in Docket No. OAR-2002-0035.) Currently, the industry uses nomographs or other relationships depicting the vapor pressure of petroleum liquids as a function of storage temperature vapor pressure and asphalt composition (e.g., flux versus oxidized) to determine the vapor pressure of stored asphalt.

Since there is no standardized test method for measuring the vapor pressure of stored asphalt, EPA believes that the final rule should specify a temperature that equates to a vapor pressure of 10 kPa, instead of requiring facilities to physically measure asphalt vapor pressure. According to industry representatives, asphalt flux reaches 10.4 kPa at approximately 500 to 550 ^{o}F (oxidized asphalt would require higher temperatures to reach 10.4 kPa). The temperature estimate cited by the industry representatives was confirmed on a theoretical level using a

regression equation for asphalt vapor pressure as a function of temperature, developed by Owens Corning using a modified version of the American Society of Testing and Materials (ASTM) method D2879 (Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope). According to the regression equation, asphalt flux reaches a vapor pressure of 10.4 kPa at approximately 450 ^{o}F.

Since the regression equation, which under-predicts the temperature at which asphalt flux reaches a given vapor pressure (according to industry and EPA representatives), tends to corroborate the storage temperature cited by the industry representatives, EPA believes that a storage temperature of 500 ^{o}F appropriately represents a vapor pressure of 10.4 kPa. Consequently, the final rule specifies that tanks storing (and loading racks transferring) asphalt at a maximum vapor pressure of 10.4 kPa or greater, or at a maximum temperature of 500 ^{o}F or greater must be controlled with a combustion device. Also, the rule allows the use of standard industry nomographs and other relationships to determine the vapor pressure of asphalt. The docket to this NESHAP (Docket No. OAR-2002-0035) contains a memorandum from the National Petrochemical and Refiners Association (NPRA) that presents several manual methods that are currently used in the petroleum industry for estimating the vapor pressure of asphalt.

2.3.4.3 De Minimis Emission Applicability Cutoff

Comment: One commenter (IV-D-08) suggested that EPA should consider a *de minimis* emission rate. Sources emitting below the rate would not be required to be controlled. Three commenters, (IV-D-08; IV-D-11; IV-D-12) stated that EPA should retain the 1.93 megagram control applicability cutoff for storage tanks even if a *de minimis* emission rate or vapor pressure cutoff for tank control is established.

Response: The EPA does not believe it permissible to establish *de minimis* cutoffs for MACT floors. The argument that EPA can avoid establishing MACT floors for reasons of *de minimis* emissions has already been rejected both in litigation, see National Lime v. EPA, 233 F. 3d at 640, and also by EPA in other rulemakings (notably, comment responses in the pulp and paper combustion sources MACT rulemaking, which comment response we incorporate by reference here). However, we have established a vapor pressure cutoff for control with a thermal oxidizer in the final rule which reflects control practices within the industry. In addition, the

proposed tank size control applicability cutoff has been revised in the final NESHAP (see section
2.3.4.2).

2.3.5 Blowing Stills

Comment: One commenter (IV-D-10) said that they control the blowing still at their refinery with a thermal oxidizer that operates at 1600°F and stated that they believe thermal oxidizers are appropriate controls for blowing stills. Another commenter (IV-D-07) agreed with the statement in the preamble (66 FR 58616) that the existing combustion sources at refineries are flares, process heaters, and boilers and noted that refineries do not typically have thermal oxidizers. The commenter stated that, based on a poll of refineries with asphalt processing, most of the combustion devices do not meet the proposed regulation. In support of this argument, the commenter noted that, in the MACT floor analysis, it was assumed that the control devices used for refinery blowing still vents operate at a temperature less than 1200°F. The commenter pointed out that, in the petroleum refineries NESHAP, vents that probably contain more HAP than asphalt vents are considered adequately controlled by directing them to combustion devices. The commenter stated that the requirements for those combustion devices are more flexible than the thermal oxidizer requirements of the proposed rule and allow the use of other combustion devices, including process heaters, boilers, and flares. The commenter concluded that because EPA determined that these control devices can adequately control refinery process vents, they can also control blowing still emissions.

Two commenters (IV-D-04; IV-D-07) suggested that refinery flux blowing still vents should be regulated in the same manner as miscellaneous process vents in the petroleum refineries NESHAP. That rule requires Group 1 process vents to be routed to a flare, boiler, process heater, or other control device that reduces HAP emissions by 98 percent or to an outlet concentration of 20 parts per million by volume (ppmv).

Response: The EPA believes that the commenter may have misunderstood the proposed rule, which would allow the use of process heaters, boilers, and flares. These combustion devices (process heaters, boilers, and flares) are considered to be types of thermal oxidizers. The

EPA recognizes, however, that the term "thermal oxidizer" was not defined in the rule and can be interpreted to mean different types of equipment. For this reason, EPA has replaced the term "thermal oxidizer" with "combustion device" and has defined combustion device to include process heaters, boilers, flares, and incinerators.

The EPA's assumption that refinery controls operate at less than 1200°F was a conservative assumption used only in determining the MACT floor. The EPA had no data on the operating temperature of control devices at refineries. In the absence of data, and not wanting to possibly skew the MACT floor towards more stringent controls that were unrepresentative of the best-performing sources, we made a conservatively low estimate of the operating temperatures. In this instance, estimating the operating temperature of existing control devices at refineries to be less than 1200°F does not mean that this is the temperature at which they are operating, but rather reflects EPA's desire not to incorrectly influence the MACT floor with estimates. We expect that refinery control devices are actually operating at greater than 1200°F.

The EPA disagrees with the commenter that flares, process heaters, and boilers at petroleum refineries could not meet the criteria of the proposed NESHAP. Indeed, the standards for miscellaneous process vents in the petroleum refinery NESHAP include flares, process heaters, and boilers as compliance alternatives to meeting a 98-percent destruction efficiency. Since this rule requires 95 percent reduction, a control device that meets requirements of the petroleum refineries NESHAP should readily be able to meet asphalt NESHAP control requirements.

Recognizing this, we have clarified that the rule allows the use of process heaters, boilers, and flares to achieve the standards applicable to blowing stills and related equipment. In addition, EPA has added a THC outlet concentration (20 ppmv) alternative to the final rule to provide a compliance option for vent streams where overall HAP emissions are low (i.e., low HAP concentrations) and demonstrating compliance with the 95 percent destruction standard is not possible.

As in the petroleum refineries NESHAP, a performance test is not required for boilers or process heaters if all vent streams to be controlled are introduced into the flame zone or if the combustion device has a design input heat capacity of 44 MW or greater. The firebox temperature of a boiler or process heater is required to be monitored continuously unless it has a

design heat input capacity of 44 MW or greater, or all vent streams are introduced into the flame zone. Flares are required to meet the design and operating requirements of section 63.11 of the NESHAP general provisions (40 CFR part 63, subpart A). An initial performance test is not required for boilers and process heaters larger than 44 MW because they operate at high temperatures and residence times. When vent streams are introduced into the flame zone of these boilers and process heaters, over 98 percent reduction or an outlet concentration of 20 ppmv is achieved. Therefore, a performance test is not necessary. The final rule does not require performance testing of flares because percent reduction and outlet concentration cannot feasibly be measured at flares. The operating conditions in § 63.11 of 40 CFR part 63, subpart A assure that the flare will be operated properly and achieve the requisite degree of destruction of organic HAP.

2.3.6 Hydrogen Chloride Emissions Due to Catalyst Use

Comment: Two commenters (IV-D-08; IV-D-11) agreed with EPA's decision not to regulate HCl emissions. One commenter (IV-D-08) stated that catalyst use is oftentimes necessitated by a facility's inability to procure "high quality" feedstock. The commenter stated that control of HCl emissions (typically through scrubbing) proves to be prohibitively expensive based on the cost per ton of HCl removed. Another commenter (IV-D-11) stated that it would be inappropriate and contrary to Congressional intent to regulate HCl emissions under the asphalt NESHAP. The commenter also agreed with EPA that not regulating HCl emissions is consistent with the holding in National Lime Association vs. EPA. The commenter explained that, for the asphalt processing industry, barring the use of chloride-based catalyst or certain asphalt flux feedstocks would prevent the manufacture of a usable product meeting industry specification. The commenter speculated that the shutdown of many facilities could result.

One commenter (IV-D-06) advocated control of HCl emissions. The commenter pointed out that HCl emissions account for most of the 212 tons per year of estimated baseline HAP emissions that result from asphalt processing and roofing manufacturing. The commenter also pointed out that EPA estimated that cost of controlling HCl to be $21,700 per ton removed and the cost of controlling other HAP to be $216,000 per ton removed. The commenter contended that requiring caustic scrubbing of HCl would result in substantial emission reductions at a lower

cost per ton than the control than is required for other HAP. The commenter, representing the industry that provides control technology, claimed that there are no apparent technological barriers to applying caustic scrubbers. The commenter asserted that substantial environmental and health benefits need to be fully considered. The commenter claimed that the proposed regulation has little economic impact on the asphalt manufacturing industry except to increase profits for most sources in the industry. The commenter contended that the magnitude of HAP reductions, the availability of relatively low cost per ton reductions, and moderate costs to the asphalt manufacturing industry are reasonable justifications for establishing more stringent requirements.

Response: As explained in greater detail in the preamble to the proposed rule (66 FR 58618-19), none of the facilities currently using catalyst are using an add-on control device to control HCl emissions. Nor is process substitution an available alternative (either as a floor control or even a beyond-the-floor control) because the catalyst is required to achieve oxidized asphalt of given quality when certain types of crude oils are being refined leading to lower-quality asphalt flux, these crude oils also being used be necessity. See 66 FR 58621. Not using chlorinated catalysts thus would mean shut down of these asphalt processing operations, as confirmed in public comments. Therefore, EPA evaluated control of HCl emissions by scrubbing as the only beyond-the-floor option.

Although the costs of emission controls are not considered in determining the MACT floor, they are considered (and must be considered, per the language of section 112 (d)(2)) in the analysis of beyond-the-floor options. Scrubbing has not been demonstrated as an effective technology for controlling HCl emissions from asphalt processing operations. Also, HCl emissions fluctuate during asphalt processing, which makes them difficult to control using gas scrubbers. Given this information and the relatively high cost compared to the potential HAP emissions reductions (both in terms of the relatively low total amount of HCl emitted nationwide and the cost-effectiveness of removal), scrubbers were determined not to be an appropriate basis for MACT. The EPA also notes that the commenter's comparison of the cost-per-ton of emission reduction between the MACT floor and beyond-the-floor options is inappropriate since costs are not considered when establishing the MACT floor.

The commenter's statement that EPA should consider the environmental benefits of HCl reduction in determining a beyond-the-floor standard, however intuitive it might seem, is nonetheless not legally permissible. The EPA views section 112(d) as establishing technology-based standards, and considerations of impact on air emission is considered as part of the section 112(f) process of determining if residual risk remains after imposition of technology-based standards. The EPA also views the consideration of cross-media impacts to assure that the air emissions standards would not be doing more harm than good due to cross-media impacts. See Portland Cement Association v. Ruckelshaus and Essex Cement v. Ruckelshaus, which cases are the genesis of the requirements to consider non-air impacts. Determining whether risk remains due to HCl emissions from these plants can only properly be considered as part of the section 112 (f) residual risk determination.

2.3.7 Saturators, Wet Loopers, and Coaters

Comment: One commenter (IV-D-06) contended that thermal oxidizers should be established as the basis for the MACT for saturators given source acceptance, experience, and availability of technology. The commenter pointed out that two of the five best-performing sources are controlled with a thermal oxidizer.

Response: The EPA assumes that the commenter was referring to saturators as defined in the proposed rule, which include saturators, wet loopers, and coaters. In this response, these three pieces of equipment are addressed separately as the MACT floor was determined for them separately.

The MACT floor for existing sources is represented by the emission limitation achieved by the median of the best-performing facilities for which EPA has data. For saturators and wet loopers, the median is the third best-performing facility. For coaters, the median is the fifth best-performing facility. For all three types of equipment, the median facility is currently meeting the PM emission limits specified by the asphalt NSPS. The PM emission limits of the asphalt NSPS can be achieved using non-combustion controls (e.g., filtration). Controlling saturators, wet loopers, and coaters with thermal oxidizers was considered by EPA as a beyond-the-floor option for existing sources. Based on the relatively high cost and limited additional emission reduction, thermal oxidizers were found not to represent MACT for existing saturators, wet loopers, and

coaters (see 66 FR 58619-21). However, the MACT for saturators, wet loopers, and coaters at new sources are based on control with a thermal oxidizer since the MACT floor for new sources is determined by the control level achieved by the best-performing facility and EPA determined that no beyond-the-floor standard for saturators, wet loopers, and coaters at new sources was appropriate (or even feasible).

2.3.8 Sealant and Adhesive Applicators

Comment: One commenter (IV-D-06) asserted that thermal oxidizers should be established as the MACT limit for sealant and adhesive applicators given source acceptance, experience, and availability of technology. The commenter pointed out that four of the five best-performing sealant and adhesive applicators are controlled with thermal oxidizers. The commenter claimed that the proposed limits for sealant and adhesive applicators provide little if any improvement over controls used to comply with existing NSPS limits. The commenter stated that this is contrary to the spirit of the MACT process whereby the maximum achievable control technology should be required to protect the environment and human health.

Response: The EPA has data for a total of 60 applicators; therefore, the floor for this emission type is represented by the median of the best-performing eight applicators (12 percent of 60). Four of the best-performing eight applicators are controlled with a thermal oxidizer while four are controlled with a PM control device subject to asphalt NSPS limits. Because there is no clear median level of control, EPA selected the less stringent of the two options (PM control meeting NSPS levels) to account for the possibility that the data may be skewed toward better-performing facilities. Although the voluntary survey was not targeted at any particular subsection of the industry, larger, better-controlled sources may have been more likely to respond due to the availability of resources. (See section 2.3.9 for a discussion of beyond-the-floor options considered during the rulemaking.)

2.3.9 Beyond-the-Floor Options

2.3.9.1 Control of Wet Loopers Associated with Saturators

Comment: One commenter (IV-D-08) supported EPA's determination that it is not appropriate to establish "beyond-the-floor" standards for sources other than wet loopers at new

and reconstructed sources. Another commenter (IV-D-11) stated that it is not appropriate to set a beyond-the-floor standard for wet loopers at new affected sources. The commenter stated that the costs of connecting a wet looper to a thermal oxidizer or similar control device do not justify the low amount of additional HAP that would be controlled. Both commenters (IV-D-08; IV-D-11) stated that beyond-the-floor options for any other emission sources would not be cost effective.

Response: The EPA continues to assert that, because new sources must control all other sources with a thermal oxidizer (or equivalent), including the wet looper emissions does not pose a significant cost (see the memorandum "Documentation of Existing and New Source Maximum Achievable Control Technology (MACT) Floors for the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Asphalt Processing and Asphalt Roofing Manufacturing" (Docket No. A-95-32)). No information was submitted by commenters to support their assertion that controlling wet loopers at new sources is not cost-effective. Controlling the emissions from a new wet looper with a PM control device while the remainder of the emission sources of a new roofing manufacturing line are controlled with a thermal oxidizer also would make little engineering sense. Indeed, it would be something like installing a water pipe for a house but then failing to make all the readily available connections. The requirement to control wet looper emissions with a thermal oxidizer (or equivalent) at new sources has been retained in the final rule.

2.3.9.2 Applicability of the Beyond-the-Floor Standard

Comment: Two commenters (IV-D-08; IV-D-11) suggested that EPA should clarify that the beyond-the-floor standard for wet loopers at new and reconstructed sources will not apply to coaters that are not associated with a saturator. One commenter (IV-D-11) noted that this is consistent with removing "coater" from the definition of "saturator," which they suggested in another section of their comments (see section 2.2, Definitions).

Response: The standard for coaters and wet loopers at new or reconstructed sources is the same (i.e., control to reduce THC emissions by 95 percent) regardless of whether the coater is associated with a saturator. However, as described in previous comment responses, EPA revised the final rule to define coaters separately from saturators.

2.3.10 Emission Limitations

2.3.10.1 Surrogates for Organic HAP

Comment: Two commenters (IV-D-08; IV-D-11) expressed support for using PM and THC as surrogates for organic HAP. One commenter (IV-D-08) noted that organic HAP accounts for a high percentage of THC emitted and PM emitted includes all HAP emitted. Another commenter (IV-D-11) stated that regulating PM and THC emissions will control HAP emitted from asphalt processing and asphalt roofing manufacturing. The commenter continued that it would not be practical or possible in some cases to regulate HAP emissions directly. The commenter explained that monitors and monitoring methods do not exist for many HAP and for other HAP, speciation would be prohibitively expensive. The commenter concluded that using PM and THC as surrogates allows for the establishment of operating parameters limits. The commenter contended that these parameter limits will ensure the same degree of HAP control as could be achieved with more direct HAP measurement.

Response: The use of PM and THC as surrogates for HAP is retained in the final rule.

2.3.10.2 Derivation of the Total Hydrocarbon Destruction Efficiency Standard

Comment: One commenter (IV-D-11) disagreed with EPA's derivation of the proposed standard requiring 95 percent total hydrocarbon (THC) destruction or removal efficiency (DRE). The commenter argued that the data set is too small for a robust statistical analysis and the commenter did not agree with EPA's approach for setting the standard (i.e., subtracting one standard deviation from the average THC DRE to account for variability). The commenter recommended that the standard be set at 92 percent, based on a visual inspection of the data and a statistical analysis that the commenter argued is appropriate for a small data set.

In deriving their recommended standard for destruction efficiency, the commenter argued that the analysis should not include the data for the Celotex facility in Fremont, California when the thermal oxidizer was operated at 1600°F because this temperature is outside the 1300 to 1500°F range at which the thermal oxidizer normally operates. The commenter added that including the data from the test at 1600°F also gives too much weight to the data from the Celotex facility because two of the four available data points are from the Celotex facility.

The commenter stated that the lowest THC destruction efficiency in EPA's data was 92.2 percent. The commenter argued that since emission sources will be required to continuously comply with the emission limits, the standard should be set at a level equal to the lowest hourly measurement of destruction efficiency. The commenter predicted that setting the standard at the proposed level may require the replacement of as many as 34 well-maintained control devices operating at or above 1200°F.

The commenter also noted that a search of the world-wide-web for "THC destruction efficiency" yielded only the asphalt roofing proposal. The commenter concluded that few data are available on THC destruction efficiency and, except for EPA's proposal, no comparable source of information is available on thermal oxidizers with respect to THC destruction efficiency.

Response: Based on the data available to EPA from this source category and prior experience with thermal oxidizers controlling emissions from other source categories, it is EPA's judgement that the proposed standard of 95 percent THC DRE is consistently achievable with a well-designed and well-operated thermal oxidizer. Therefore, the proposed THC DRE is retained in the final NESHAP.

The EPA agrees with the commenter that the available data set is too small for a rigorous statistical analysis. Therefore, EPA chose to account for the variability in the data by subtracting one standard deviation from the mean, rather than performing a more formal statistical analysis to derive the proposed emission limit. Since proposal, EPA has also calculated the 95-percent confidence interval about the mean of the test data for THC destruction efficiency. The lower limit of the 95 percent-confidence interval is 94.85 percent THC DRE. In other words, there is only a five-percent chance that the true population mean of THC DRE will be below 94.85 percent. In addition, all four of the facilities with THC DRE data would meet the standard. This calculation supports EPA's original proposal for a THC DRE of 95 percent as representing MACT.

The data used in calculating the limit for THC DRE and the 95-percent confidence limit are presented in table 1. The formulas used in computing the sample standard deviation, S, and the 95 percent confidence limit, CL_{95}, are provided below:

$$S = \sqrt{\frac{n\sum X^2 - \left(\sum X\right)^2}{n(n-1)}}$$

$$CL_{95} = \overline{X} - t_{95}\frac{S}{\sqrt{n}}$$

Table 1. Test Data Used in Estimating the Lower Limit of the 95 Percent Confidence Intervals for the THC Destruction and Combustion Efficiency Standards

Site	Process Equipment Controlled	Thermal Oxidizer Operating Temp (°F)	Run	THC Destruction Efficiency	Combustion Efficiency
Owens Corning, Minneapolis, MN	Oxidized asphalt storage tanks and coater	1,250	1	92.2	99.62
			2	97.7	99.37
			3	Not valid	99.71
			4	95.4	99.64
			5	94.7	99.75
			Average	95.0	99.62
Celotex, Fremont, CA	Coater, tanks, mixers, sealant and adhesive applicators	1,400	1	96.7	99.73
			2	94.9	99.74
			3	94.3	99.75
			Average	95.3	99.74
Celotex, Fremont, CA	Coater, tanks, mixers, sealant and adhesive applicators	1,600	1	96.2	Not applicable
			2	96.1	Not applicable
			3	96.6	Not applicable
			Average	96.3	Not applicable
U.S. Intec, Port Arthur, TX	Modified bitumen mixing and holding tanks	1,400	1	91.6	Not measured
			2	99.9	Not measured
			3	99.8	Not measured
			Average	97.1	Not measured
Owens Corning, Jessup, MD	Blowing stills, oxidized asphalt storage tanks, loading racks	1,500	1	Not measured	99.98
			2	Not measured	99.96
			3	Not measured	99.98
			Average	Not measured	99.97
Sample Size				4	3
Average of Averages (%)				95.94	99.79
Standard Deviation (%)				0.92	0.18
Degrees of Freedom				3	2
t_{95}				2.3534	2.9200
95% Lower Confidence Limit (%)				94.85	99.49

where

t_{95} = 2.3534 for 3 degrees of freedom

t_{95} = 2.9200 for 2 degrees of freedom

The calculations of the 95-percent confidence limit included all of the available data except those for the CertainTeed facility in Oxford, North Carolina and the data for run 3 at Owens Corning in Minneapolis, Minnesota. The thermal oxidizer at the CertainTeed facility in Oxford, North Carolina experienced operating problems and could not maintain a constant combustion temperature. The data from run 3 at Owens Corning in Minneapolis, Minnesota were invalid because the THC inlet measurement did not meet the post-test zero-drift criteria.

The EPA agrees that the thermal oxidizer at the Celotex facility in Fremont, California does not normally operate at 1600°F, but EPA believes that these data should be considered in setting the emission limit. Testing was performed at this temperature because the MACT floor includes the thermal oxidizer at the Owens Corning facility in Jessup, Maryland, which has a thermal oxidizer operating at 1500 to 1600°F. However, the THC concentration for all of the inlets to the thermal oxidizer at the Jessup, Maryland facility could not be measured. Therefore, the thermal oxidizer at the Celotex facility was tested while operating at 1600°F to represent the MACT floor facility that could not be tested, and to investigate the performance difference achieved by a thermal oxidizer operating at 1400°F and 1600°F. Because these data were used to represent a facility other than Celotex in Fremont, California, EPA does not believe that including these data gives too much weight to the Celotex facility.

The EPA disagrees with the commenter that the emission limit should be established at the lowest THC destruction efficiency measured during the test program. As specified in the NESHAP general provisions (section 63.7 (e)(3)), each performance test used to demonstrate compliance with a relevant standard must consist of three test runs. Compliance with the standard is determined by the arithmetic average of the three test run results, not the lowest value of the three test runs. For example, the lowest THC destruction efficiency measured in a single test run was 91.6 percent (not 92.2 percent as cited by the commenter). This value was measured at the U.S. Intec facility in Port Arthur, Texas. Although this value is significantly below the proposed THC destruction efficiency, the average of the three test runs for the Port Arthur facility is 97.1 percent. Consequently, this facility would be in compliance with the THC destruction efficiency standard.

The commenter is also incorrect in suggesting that the limit should be set at 92 percent destruction efficiency because facilities must be in continuous compliance with the emission limit. The commenter's argument incorrectly implies that a source must continuously monitor destruction efficiency. In fact, initial compliance is based on the average emission rate measured over three one-hour test runs during an emission test. Following the initial performance test, the facility must demonstrate continuous compliance by monitoring the combustion temperature of the thermal oxidizer and maintaining the average temperature, determined over a three-hour period, at or above the temperature established during the initial performance test.

The commenter is incorrect in concluding that the only available data for THC destruction efficiency of thermal oxidizers are those presented with respect to the proposed asphalt processing and roofing standards. The EPA's thermal oxidizer fact sheet (http://www.epa.gov/ttncatc1/dir1/fthermal.pdf) indicates that, based on numerous sources of test data, thermal oxidizers can achieve 98 to 99.9 percent destruction of THC and VOC (VOC destruction efficiency, rather than THC destruction efficiency, is often used to describe the performance of a combustion control devices). Previous EPA experience in developing emission standards for other source categories (e.g., petroleum refineries; pulp and paper industry; wet-formed fiberglass mat manufacturing) supports EPA's judgement that properly designed and operated thermal oxidizers are capable of consistently achieving a THC destruction efficiency of 95 percent or greater.

Regarding the commenter's concern that existing thermal oxidizers will not be able to meet the standards, EPA agrees with the commenter that some thermal oxidizers operating at 1200°F may not be able to achieve the proposed THC destruction efficiency limit. Many existing thermal oxidizers were intended primarily for the control of PM under the new source performance standards (NSPS) (40 CFR part 60, subpart UU), not for the control of THC, VOC, or organic HAP. However, EPA believes that the extent to which existing thermal oxidizers will need to be replaced is overstated by the commenter. In the economic analysis, EPA has projected that only 19 asphalt processing and/or roofing manufacturing facilities would be subject to the proposed NESHAP because they are estimated to be major sources. All other asphalt processing or roofing manufacturing facilities are expected to be area sources and would not be subject to the proposed NESHAP (66 FR 58615). While EPA expects that a small

number of existing thermal oxidizers at major sources may need to be upgraded or replaced, EPA believes that the NESHAP emission limits are readily achievable using well-designed and well-operated thermal oxidizers.

2.3.10.3 Derivation of the Combustion Efficiency Standard

Comment: One commenter (IV-D-11) agreed with EPA that the nature of exhaust gas at the entrance to a thermal oxidizer could cause fouling of emission test equipment and supported allowing facilities to demonstrate compliance by either meeting a THC destruction efficiency standard or a combustion efficiency standard. However, the commenter argued that the derivation of the 99.6 percent combustion efficiency requirement was incorrect. The commenter contended that the data set used to derive the combustion efficiency is too small to support the conclusion that thermal oxidizers operating at or above 1200°F can consistently achieve a combustion efficiency of 99.6 percent. The commenter stated that, based on EPA's Fact Sheet on thermal oxidizers, the combustion efficiency standard should be set at 98 percent. Another commenter (IV-D-08) objected to the combustion efficiency standard being set at 99.6 percent and stated that the combustion efficiency is overly stringent and unreasonable.

Response: The EPA agrees with the commenter that the available data set used to establish the combustion efficiency limit is too small for a rigorous statistical analysis. Therefore, when developing the proposed standard, EPA chose to account for the variability in the data by subtracting one standard deviation from the mean, rather than performing a more formal statistical analysis.

However, EPA has decided to revise the proposed combustion efficiency limit. Since proposal, EPA has calculated the 95-percent confidence interval about the mean of the test data used to establish the proposed combustion efficiency. The data used in calculating the limit for combustion efficiency and the 95 percent confidence limit are presented in table 1. The lower limit of the 95-percent confidence interval is 99.49 percent combustion efficiency. Since this value is lower than the proposed combustion efficiency limit of 99.6 percent, EPA has decided to lower the combustion efficiency limit in the final rule to 99.5 percent.

The calculation of the 95 percent confidence limit for combustion efficiency does not include the data for the CertainTeed facility in Oxford, North Carolina, since this facility

experienced operating problems with the thermal oxidizer during the test. The computation also does not include the data for the thermal oxidizer operating at 1600°F at the Celotex facility in Fremont, California. Unlike the derivation of the THC DRE, where the data from the thermal oxidizer operating at 1600°F at the Celotex facility was used to represent the performance of the thermal oxidizer at the Owens Corning facility in Jessup, Maryland, the combustion efficiency of the Jessup thermal oxidizer was measured so it is unnecessary to look to emissions from a proxy source. Therefore, the Jessup data for combustion efficiency was used in place of the Celotex data.

With regard to EPA's fact sheet of thermal oxidizers, the commenter is incorrect in asserting that the document supports a combustion efficiency standard of 98 percent. The fact sheet only discusses thermal oxidizer destruction efficiency, which is determined by measuring the inlet and outlet pollutant mass flow rates. Combustion efficiency is measured only at the thermal oxidizer outlet as the ratio of the sum of products of incomplete combustion in the exhaust (i.e., CO and THC) to the sum of all organic compounds present in the exhaust (i.e., CO, THC, and CO_2). The combustion efficiency limit in the final rule is 99.5 percent.

2.3.10.4 Level of the Combustion Efficiency Standard

Comment: One commenter (IV-D-08) claimed that some sources that are currently controlled by otherwise "MACT-floor compliant" thermal oxidizers would not be able to achieve the 99.6 percent combustion efficiency in the proposed standard. The commenter pointed out that, based on the cost estimate, EPA did not intend for the regulation to require the replacement of existing, properly functioning thermal oxidizers.

Response: The EPA assumes that when the commenter refers to "MACT-floor compliant" thermal oxidizers, that the commenter means the thermal oxidizers that are operating at 1200°F or greater. The combustion efficiency standard is only one of the compliance options provided in the rule. Facilities also have the option of demonstrating compliance with the THC destruction efficiency standard by using boilers, process heaters, or flares that meet the requirements specified in the NESHAP. While EPA expects that a small number of existing thermal oxidizers at major sources may need to be upgraded or replaced, EPA believes that the proposed combustion and THC destruction efficiency standards are achievable using well-

designed and well-operated thermal oxidizers. As support for this assertion, the thermal oxidizer at the Owens Corning, Minneapolis, Minnesota facility, which was operated at 1250°F, would be able to comply with both the combustion and THC destruction efficiency standards (see table 1).

2.3.10.5 Test Data Variability

Comment: One commenter (IV-D-11) contended that the proposed standards for combustion efficiency and THC DRE are not achievable because they do not adequately account for variability. The commenter asserted that EPA and the courts have recognized the importance of accounting for such variability between facilities, processes, and test results citing Sierra Club v. EPA, 167 F.3d 658, 665 (D.C. Cir. 1999), National Lime Association v. EPA, 627 F2d 416, 452-53 (D.C. Cir. 1980) and Portland Cement Association v. Ruckelshaus, 486 F.2d 375, 396 (D.C. Cir. 1973), *cert. denied*, 417 U.S. 921 (1974) in support of this argument. The commenter added that since the standards are based on emission test data, EPA needs to account for several types of variability to avoid forcing facilities to the brink of shutdown even when they have installed the best pollution control technology available. The commenter argued that EPA needs to account for the following types of variability:

Operational distinctions between facilities or units - Within the same source category, facilities and units may be configured differently and use different raw materials or fuels. These distinctions usually have a direct effect on resulting emissions and on the performance that the various units are capable of achieving. The range of expected emissions for similar facilities can be determined statistically if enough data are available. The performance of control technology at one plant may not be "representative" of such performance at other plants due to different process configurations, different utility or facility size, different feedstocks used, and other factors. It is necessary to account for these variations in some way because MACT floors and standards are usually expressed as numerical limits.

Operational distinctions between tests at the same facility - Commonly referred to as "between-test variability," variations in emissions are often caused by differences in a variety of factors such as operation of control equipment, operation of the process unit in general, temperature and humidity, atmospheric pressure, and moisture content of the waste can cause

variations in emissions. Additionally, different settings for testing equipment, differences in sample handling, different field teams conducting testing, and different laboratories can lead to different results. These variations are typical and are to be expected. Additionally, it is not uncommon for testers and analyzing laboratories to make errors. The commenter stated that an achievable standard needs to account for these difference between tests, citing National Lime Association, 627 F.2d at 431 n.46, Portland Cement Association, 486 F.2d at 396, Chemical Manufacturers Association v. EPA, 870 F.2d 177, 228 (5th Cir. 1989), American Petroleum Institute v. EPA, 540 F.2d 1023, 1035-36 (10th Cir. 1976), and 47 Fed. Reg. 24534, 24546 (1982) in support of their argument:

Within-test variability - A single test at a facility includes at least three separate test runs. The same types of differences and errors that lead to "between-test variability" also cause variations in results between runs within a single test. The commenter cited Portland Cement Ass'n, 468 F.2d at 397 in support of their argument.

The commenter noted that in its brief in the Sierra Club v. EPA case, EPA pointed out that trying to set a technology-based emission standard by considering a limited data set "ignores the critical distinction between an emission level that is ‘observed' on a particular occasion versus an emission level the Administrator determines is ‘achieved in practice' through performance because it is capable of being met continuously under that range of operating conditions that can reasonably be expected." The commenter contended that observed emission levels in the form of limited test results bear no relationship to what a variety of differently configured plants (or a single unit) can achieve on a continuous basis because each test produces very little data rather than a full enumeration of the unit's performance over a long period of time. The commenter concluded that the small data set EPA used to support floor calculations does not account for various types of variability. The commenter recommended that EPA set the combustion efficiency THC DRE standards by considering the worst possible conditions that can be expected to be encountered by a thermal oxidizer operating at or above 1200°F.

Response: The EPA believes that it has accounted for both process, operational, and analytic variability in establishing the emission standards. In developing the rule, EPA worked closely with the regulated community to develop a test program that represented the range of process configurations and operating conditions that exist in the industry. In addition, EPA has

set the final limits for combustion efficiency and THC destruction efficiency at a level equivalent to the lower limit of the 95-percent confidence interval around the mean of the available test measurements for these parameter to account for variability of all types. That the limit is achievable is demonstrated in table 1, showing all sources achieving both THC DRE and combustion efficiency standards in all cases.

The EPA believes that the proposed emission limits can be met under the most adverse conditions that can be reasonably expected to occur. With one exception (the CertainTeed facility in Oxford, North Carolina), all of the facilities tested under the test program would be in compliance with the proposed emission limits. Both EPA and the commenter agreed that the control device at the CertainTeed facility was not operating properly during the emission test and those data should not be included in setting the emission limits.

The EPA believes that it has considered the three types of variability discussed by the commenter in establishing the final emission limits. First, EPA believes the emission limits account for operational distinctions among facilities and emission units. In setting the standards, EPA has relied on emissions test data collected from a variety of facilities within the industry during a test program developed in cooperation with the commenter. These facilities represent the full range of emission units that will be regulated by the limits for THC DRE or combustion efficiency.

Second, EPA has relied on emissions test data that met strict quality control and assurance guidelines for emissions testing. The EPA specifically excluded those data that did not meet these criteria and were of questionable validity. Future emission test data for compliance demonstrations must meet the same guidelines. The EPA believes that following these quality control guidelines will minimize differences among testing contractors and analytical laboratories that could lead to the "between-test" variability discussed by the commenter.

Finally, since compliance with the emission limits is based on the average of three test runs, the emission limits also account for the "within-test variability" discussed by the commenter. The NESHAP does not preclude facilities from conducting more than three test runs if a facility believes that additional test runs are needed to account for variability.

2.3.10.6 Regenerative Thermal Oxidizers

Comment: Two commenters (IV-D-08; IV-D-11) objected to the proposed method for calculating combustion efficiency in regard to regenerative thermal oxidizers (RTO). One commenter (IV-D-08) stated that they operate RTO at a number of facilities and would like to use the combustion efficiency approach because it is simpler and less expensive to use than the destruction efficiency standard. The commenter claimed that they may not be able to use the combustion efficiency standards because the method for calculating combustion efficiency understates the combustion efficiency achieved by RTO. Another commenter (IV-D-11) stated that measuring the combustion efficiency in the manner set forth in the proposed rule could prevent the use of an RTO even though they are generally at least as effective as traditional thermal oxidizers.

Two commenters (IV-D-08; IV-D-11) requested that EPA adopt a separate destruction efficiency for RTO that uses the sum of carbon from the CO_2, THC, and CO at the outlet of the RTO to calculate the inlet level of carbon. One commenter (IV-D-08) explained that EPA's equation penalizes control technologies that do not burn auxiliary fuel and have a relatively low CO_2 concentration at their outlets. The commenter stated that they have conducted a number of tests on RTO and in most cases, CO_2 was not detectable and EPA's equation for combustion efficiency would be impossible to use in such a situation. The other commenter (IV-D-11) explained that the only relevant source of CO_2 in RTO exhaust comes from the destruction of hydrocarbons. Both commenters proposed the following equation be used to calculate destruction efficiency for RTO:

$$\text{Destruction Efficiency} = \{(CO_2 + CO + THC) - THC\}/ (CO_2 + CO + THC)$$
$$= (CO_2 + CO) / (CO_2 + CO + THC)$$

One commenter (IV-D-11) added that the THC of natural gas or fuel oil would be obtained from a fuel analysis and fuel usage during the performance test.

Response: The EPA has reviewed the test data submitted by the commenters and agrees that, because RTO's do not use auxiliary fuel, the outlet CO_2 concentrations are much less than those of conventional thermal oxidizers. Consequently, EPA added an option to the final rule to allow combustion devices that do not use auxiliary fuel to use the outlet-only THC destruction efficiency equation.

The test data submitted by the commenters is summarized in Table 2. Using the same approach as was taken for the derivation of the THC destruction efficiency and combustion efficiency standards, one standard deviation was subtracted from the average THC destruction efficiencies calculated from the test data. The resulting calculations yields a THC destruction efficiency standard for RTO's of 95.8 percent.

Table 2. Summary of Regenerative Thermal Oxidizer Outlet Data and THC Destruction Efficiency

Sampling Location Description	Run No.	CO Outlet Conc. (ppmv)	CO_2 Outlet Conc. (%)	THC Outlet Conc. (ppmv)	THC Destruction Efficiency (%)
Stack 3, batch 3	1	15.7	0.3	77.6	97.49
Stack 3, batch 3	2	23.3	0.5	127.8	97.52
Stack 3, batch 3	3	146.7	0.7	159.3	97.82
Stack 3, batch 3	4	168.6	0.8	158.9	98.09
Stack 3, batch 3	5	129.7	1.0	174.3	98.31
Stack 3, batch 3	6	81.7	1.1	197.3	98.25
Stack 3, batch 3	7	129.2	0.9	174.9	98.12
Stack 3, batch 3	8	99.8	0.7	156.3	97.85
Stack 3, batch 1	1	33.8	0.3	127.9	95.95
Stack 3, batch 1	2	53.7	0.5	183.9	96.49
Stack 3, batch 1	3	82.6	0.8	269.0	96.78
Stack 3, batch 1	4	112.3	0.9	329.1	96.51
Stack 3, batch 1	5	88.4	1.0	386.1	96.31
Stack 3, batch 1	6	75.2	1.1	428.7	96.27
Stack 3, batch 1	7	96.5	1.2	437.9	96.51
Stack 3, batch 2	1	37.2	0.3	126.9	95.99
Stack 3, batch 2	2	46.8	0.7	195.9	97.30
Stack 3, batch 2	3	68.3	0.9	258.5	97.23
Stack 3, batch 2	4	70.8	1.1	341.7	97.01
Stack 3, batch 2	5	70.9	1.2	419.8	96.64
Stack 3, batch 2	6	65.2	1.2	423.9	96.61
Stack 3, batch 2	7	68.3	1.1	462.3	95.99
Stack 3, batch 3 (10/22/98)	1	22.6	0.4	231.2	94.56
Stack 3, batch 3 (10/22/98)	2	35.3	0.9	283.5	96.96
Stack 3, batch 3 (10/22/98)	3	58.7	1.1	371.9	96.75
Stack 3, batch 3 (10/22/98)	4	83.8	1.0	387.0	96.30
Stack 3, batch 3 (10/22/98)	5	92.2	0.8	351.4	95.84
Stack 3, batch 3 (10/22/98)	6	56.4	0.8	344.0	95.90
Stack 3, batch 3 (10/22/98)	7	55.6	0.7	362.2	95.12
No. 3 RTO	1	83	0.7	479.0	93.67
No. 3 RTO	2	75	0.9	486.0	94.92
No. 3 RTO	3	86	0.7	336.0	95.47
Stack 3, batch 1 (9/28/98)	1	18.1	0.3	137.0	95.66
Stack 3, batch 1 (9/28/98)	2	34	0.7	170.2	97.64
Stack 3, batch 1 (9/28/98)	3	49.3	1.1	229.5	97.97
Stack 3, batch 1 (9/28/98)	4	86.6	1.3	274.7	97.94
Stack 3, batch 1 (9/28/98)	5	59.4	1.1	270.5	97.61

Table 2. Summary of Regenerative Thermal Oxidizer Outlet Data and THC Destruction Efficiency

Sampling Location Description	Run No.	CO Outlet Conc. (ppmv)	CO_2 Outlet Conc. (%)	THC Outlet Conc. (ppmv)	THC Destruction Efficiency (%)
Stack 3, batch 1 (9/28/98)	6	77.4	1.1	248.1	97.81
Stack 3, batch 1 (9/28/98)	7	80.5	1.1	243.6	97.85
Stack 3, batch 1 (9/28/98)	8	81	1.0	255.7	97.53
Stack 3, batch 2 (9/30/98)	1	11.3	0.3	120.3	96.16
Stack 3, batch 2 (9/30/98)	2	28.5	0.8	220.1	97.33
Stack 3, batch 2 (9/30/98)	3	119.3	1.0	229.5	97.78
Stack 3, batch 2 (9/30/98)	4	55.5	0.8	178.8	97.83
Stack 3, batch 2 (9/30/98)	5	37	0.8	197.3	97.60
Stack 3, batch 2 (9/30/98)	6	39	0.8	206.5	97.50
Stack 3, batch 2 (9/30/98)	7	35.9	0.7	187.6	97.40

Average of all RTO data (%) = 96.85

Standard deviation of data (%) = 1.06

Average - one standard deviation (%) = 95.8

2.3.11 Control Devices

2.3.11.1 Use of Control Devices Other Than Thermal Oxidizers

Comment: One commenter (IV-D-11) expressed support for flexibility in the rule that allows facilities to achieve compliance with the THC and PM emission standards using control devices other than incinerators.

Response: The requirements for demonstrating compliance with the THC and PM emission standards have been retained in the final rule.

2.3.11.2 Performance of Thermal Oxidizers

Comment: One commenter (IV-D-11) agreed with EPA's determination that thermal oxidizers operating above 1200°F do not appear to destroy organic HAP with greater efficiency than thermal oxidizers operating at 1200°F. The commenter noted that results from the ARMA testing program show that there is not apparent relationship between thermal oxidizers operating above 1200°F and the destruction efficiency of organic HAP, citing docket item II-D-30. The commenter concluded that it is appropriate not to differentiate between thermal oxidizers operating at or above 1200°F.

Response: The MACT requirements for blowing stills, which are based on a thermal oxidizer operating at or above 1200°F, have been retained in the final rule. The comment thus supports this result.

2.3.11.3 Performance of Particulate Matter Control Devices

Comment: One commenter (IV-D-11) supported EPA's conclusion that the appropriate floor technology for controlling HAP present as PM is a PM control device that can meet the asphalt NSPS. The commenter agreed that there are no data suggesting that better-performing PM control devices are in use in the industry.

Response: The MACT floor for saturators, wet loopers, coaters, coating mixers, and sealant and adhesive applicators at existing sources is represented by non-combustion control devices (e.g., high velocity air filters, electrostatic precipitators, and fiber-bed filters) meeting the asphalt NSPS PM limits. However, EPA disagrees with the comment that facilities are not using control devices that achieve greater PM reductions than devices used to comply with the PM emissions limits of the asphalt NSPS. Although they are not the MACT floor, thermal oxidizers, which achieve higher PM reductions than non-combustion control devices, are currently in use for all types of HAP sources (except wet loopers) at a few asphalt processing and roofing manufacturing facilities. These thermal oxidizers are the basis of the MACT floor for new sources.

2.4 TESTING REQUIREMENTS

2.4.1 Performance Test Requirements

Comment: One commenter (IV-D-07) stated that the types of combustion devices used to control blowing still emissions at refineries are not conducive to performance testing. The commenter pointed out that performance testing is not required for combustion devices used to control process vents to comply with the petroleum refineries NESHAP. Two commenters (IV-D-04; IV-D-07) recommended that the performance testing requirements for alternate combustion-type control devices be eliminated. Another commenter (IV-D-03) recommended that, because they are the basis for the MACT floor for blowing stills, tanks and loading racks, thermal oxidizers operating at or above 1200°F should be considered in compliance with the

combustion efficiency standard of 99.6 percent. The commenter stated that this would eliminate unnecessary and costly performance testing to confirm the ability of combustion devices to efficiently control organic HAP emissions, which has already been well documented.

Response: The EPA recognizes that certain combustion devices meeting certain criteria at petroleum refineries have been determined to control HAP emissions by 98 percent and that these devices are not required to be tested by other NESHAP. For this reason, the rule has been revised to include the same testing and monitoring requirements as the petroleum refineries NESHAP for process heaters, boilers, and flares. As in the petroleum refineries NESHAP, a performance test is not required for flares. A performance test is also not required for boilers or process heaters if all vent streams to be controlled are introduced into the flame zone or if the combustion device has a design input heat capacity of 44 MW or greater. The firebox temperature of a boiler or process heater is required to be monitored continuously unless it has a design heat input capacity of 44 MW or greater or all vent streams are introduced into the flame zone. Flares are required to meet the design and operating requirements of section 63.11 of subpart A (the NESHAP general provisions).

2.4.2 Performance Test Conditions

Comment: One commenter (IV-D-11) suggested that the proposed rule is inconsistent on the conditions under which facilities are to conduct their performance tests. The commenter noted that the preamble states that performance tests should be conducted under "normal operating conditions" and "operating conditions that reflect the highest rate of asphalt processing or roofing manufacturing reasonably expected to be achieved by the facility." The commenter pointed out that table 3 of the rule provides the requirements for performance tests, specifying particular conditions that would apply across-the-board to facilities that produce different products. The commenter asserted that, in response to the requirement in table 3 that specifies "If the product is shingle or mineral-surfaced roll roofing, tests must be conducted while a nominal 106.6 kilograms (kg) (235 pound) shingle is being produced," many facilities do not even manufacture these two products. The commenter also noted that the table also prescribes the type of saturated felt or fiberglass shingle that is to be used, regardless of the type of product actually being manufactured.

The commenter suggested that table 3 should be revised to reflect the basic approach stated in the preamble. The commenter contended that it is important that facilities be allowed to conduct performance tests using a product that is or may be manufactured at the facility that is expected (based on knowledge of the manufacturing process) to result in the highest asphalt emissions per ton of asphalt processes.

Response: The EPA agrees that there is an inconsistency in the preamble and proposed rule regarding the conditions under which the performance tests are to be conducted. The rule has been revised to specify that the performance tests must be conducted while manufacturing the roofing product that is expected to result in the greatest HAP emissions and operating at the highest normal production rate. Equipment must be re-tested if the facility intends to operate at a higher rate or manufacture products that will result in higher emissions than what was represented during the original performance test.

2.4.3 Use of Existing Performance Tests

Comment: One commenter (IV-D-11) stated that there is no need to conduct expensive duplicative testing if a facility previously conducted testing under conditions similar to those that would be used in the performance test. The commenter recommended that the rule allow data obtained through testing that meets EPA requirements may be used in lieu of conducting all or part of a performance test. The commenter cited the hazardous waste combustor MACT (40 CFR section 63.1207 (c)(2)) as an example of where this approach has been used before. The commenter suggested requiring that the previous tests either (1) have been conducted for regulatory purposes, or (2) meet EPA testing criteria. The commenter concluded that, as long as the tests were also conducted under conditions similar to those required under the performance test requirements of the NESHAP, EPA should allow the data to be used in lieu of a performance test conducted expressively to show compliance with the NESHAP.

Response: The EPA agrees with the commenter that duplicative emissions testing should not be necessary. Where possible, a facility should be able to use the results of a previously-conducted emissions test to demonstrate compliance with the NESHAP. However, the facility must be able to demonstrate to the Administrator's satisfaction that: (1) no changes have been made to the process since the time of the emissions test, (2) the operating conditions and test

methods used during testing conform to the requirements of this NESHAP, and (3) the control device and process parameter values established during the previously-conducted emission test are those required by this NESHAP and are being used to demonstrate continuous compliance with this NESHAP.

2.4.4 Outlet-Only Performance Test Option for Blowing Stills

Comment: One commenter (IV-D-03) recommended that EPA provide a performance testing option that requires measurement of only the post-control emissions for blowing stills. The commenter explained that testing before the control device is problematic because of air introduced during the blowing process and sample port access.

Response: The proposed and final NESHAP contain an option for determining the combustion efficiency of a control device that does not require inlet testing. This option was included to specifically address the problems of sampling the outlet emissions of blowing stills prior to the control device. Also, an option for electric regenerative thermal oxidizers (i.e., thermal oxidizers that do not use auxiliary or supplemental fuel) was added to the final rule that allows compliance to be demonstrated by measuring control device outlet concentrations.

2.4.5 Use of Engineering Calculations to Demonstrate Compliance

Comment: One commenter (IV-D-03) stated that the rule should include an option to use engineering calculations as a means of showing compliance with emission limitations.

Response: Initial performance tests must be conducted to demonstrate initial compliance, except for those control devices that EPA has already determined will meet the required HAP destruction efficiency (see section 2.4.1). Testing is not required for flares or for boilers or process heaters if (1) the boiler or heater has a design heat input capacity of 44 MW or greater, or (2) all vent streams are introduced into the flame zone.

An initial performance test is not required for boilers or process heaters with a design heat input capacity of 44 MW or greater or where the emissions are introduced into the flame zone of the boiler or process heater. Performance testing is also not required for flares that meet the design and operating requirements of § 63.11(b) of subpart A of part 63. An initial performance test is not required for boilers and process heaters larger than 44 MW because they

operate at high temperatures and residence times. When vent streams are introduced into the flame zone of these boilers and process heaters, over 98 percent reduction or an outlet concentration of 20 ppmv is achieved. Therefore, a performance test is not necessary. The final rule does not require performance testing of flares because percent reduction and outlet concentration cannot feasibly be measured at flares. The operating conditions in § 63.11 of 40 CFR part 63, subpart A assure that the flare will be operated properly and achieve the requisite degree of destruction of organic HAP.

2.5 MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

2.5.1 Operating Limits

Comment: One commenter (IV-D-11) supported the use of operating limits. The commenter explained that, although it is appropriate to set emission limits in terms of THC destruction efficiency, combustion efficiency, and amount of particulate emitted per ton of product, it would be extremely expensive and impractical to directly measure compliance with these limits. The commenter stated that developing operating limits through performance tests solves this problem. The commenter agreed with the general concept of operating limits, although the commenter expressed disagreement with some specific implementation provisions.

Response: The option to demonstrate continuous compliance using operating limits has been retained in the final rule.

2.5.2 Level of the Proposed Requirements

Comment: One commenter (IV-D-08) objected to the monitoring, recordkeeping, and reporting requirements of the proposed rule, stating that they are onerous and overly burdensome. The commenter disagreed with EPA's assertion that the selected requirements are those determined to be the minimum necessary to determine continuous compliance and claimed that EPA seriously underestimated the burden of monitoring and recordkeeping. As an example, the commenter claimed that proposed continuous parameter monitoring system requirements (section 63.8688 (a)) will require labor-intensive manual review of all monitoring data or an upgrade of existing monitoring systems to digital systems that are generally not available in the

industry. The commenter said that the continuous chart recorders currently in use are not capable of the type of monitoring required in the proposed rule.

Response: The EPA contends that the monitoring, recordkeeping, and reporting requirements of the proposed rule are the minimum necessary to determine continuous compliance and are not overly burdensome. The requirements primarily refer to the NESHAP general provisions and are no more stringent than other NESHAP that have been recently promulgated. The commenter did not provide any alternatives to the proposed monitoring, recordkeeping, and reporting requirements.

However, the monitoring requirements of the final rule have been revised to clarify language that could have been interpreted by the commenters to be overly burdensome. The requirements have also been revised to give facilities additional flexibility by including specific requirements for CEMS (and COMS, if used) and providing the option to select either three-hour or 15-minute averaging period for monitoring parameter values.

2.5.3 Analog Chart Recorders

Comment: One commenter (IV-D-11) stated that, because computers and other equipment needed for monitoring will be expensive, facilities should be given the option of using a less expensive chart recorder if they are willing to accept more stringent compliance requirements. The commenter noted that the proposed rule provides for 3-hour averaging periods for monitored control device parameters, based on data collected every 15 minutes. The commenter stated that, based on their understanding of the proposed rule, the 15-minute data points can exceed an operating limit as long as the 3-hour average does not exceed the operating limit. The commenter recommended that facilities be given the option of using chart recorders if they are willing to accept that exceedance of the numerical value of the operating limit for any 15-minute data point will be treated as a "deviation."

Response: While the proposed rule (section 63.8688 (b)(4)) contains sensitivity requirements for chart recorders, EPA acknowledges that the majority of the monitoring requirements are based on the use of equipment that is computer-based. It is EPA's understanding that many facilities use chart recorders to display and record monitored parameters. When chart recorders are used, the value of the monitored parameters is generally

not recorded electronically. The parameter values therefore can not be automatically averaged and compared to the established range to determine if there has been an parameter deviation. Such a determination would have to be made through manual calculations.

As proposed, the rule requirements are not conducive to using a chart recorder. The commenter has suggested that chart recorders could more easily be used for monitoring if manual calculations of hourly averages were not required. The EPA has determined that this is an acceptable approach for determining continuous compliance as it is actually more stringent than the requirements in the proposed rule. The rule has been revised to allow facilities the option of calculating 3-hour block averages or using a 15-minute value to demonstrate continuous compliance.

2.5.4 Calibration Procedures

Comment: One commenter (IV-D-08) stated that calibration procedures (sections 63.8688 (b) and (c)) for temperature and pressure monitoring devices will require the hiring of additional personnel or outside contractors as the skills required are not generally available at processing and roofing manufacturing facilities. The commenter noted that proper calibration is important but found the proposed frequency excessively costly. The commenter urged EPA to reevaluate the monitoring, recordkeeping, and reporting requirements and include only those that are truly the minimum necessary to determine continuous compliance.

Response: The EPA agrees that the language used in the proposed calibration procedures for temperature and pressure monitoring devices could have been interpreted to be overly burdensome. These calibration procedures in the final rule have been revised to improve clarity.

2.5.5 Use of Continuous Emission Monitoring Systems

Comment: One commenter (IV-D-06) stated that EPA should allow for a full spectrum of options and consider operational parametric monitoring as the low end of the spectrum rather than the high end. The commenter pointed out that EPA considered continuous emission monitoring systems (CEMS) and operational parametric monitoring, representing two ends of the spectrum of monitoring technology options that could satisfy compliance requirements and/or be used to enhance operational performance of a source and its control technologies. The

commenter noted that more expensive options tend to yield more useful information. The commenter said that monitoring options are available and are cost effective and can enhance industry compliance and collection of industry data and potentially assist in the optimization of the performance of manufacturing processes. The commenter agreed that facilities should be allowed, if not encouraged, to use CEMS and continuous opacity monitoring systems (COMS) as options for operations parametric monitoring. The commenter suggested that EPA should consider the robust range of monitoring technologies that can be scaled to sources to meet compliance and enhance operations.

Another commenter (IV-D-11) asserted that monitoring control device parameters to determine compliance with operating limits will ensure compliance with the MACT standards and that requiring the use of CEMS and COMS would be unreasonable and unnecessary. The commenter agreed that it would be useful to provide a provision to allow facilities to use CEMS and COMS as options to parametric monitoring. The commenter stated that if a facility elects to use a CEMS or COMS it should be allowed to do so and the part 63 General Provisions regarding the use of CEMS and COMS should apply.

Response: Although EPA agrees with the commenter that CEMS and COMS provide additional useful data and that facilities should be encouraged to use CEMS and COMS where feasible and beneficial to them, EPA does not believe it is reasonable to require the use of CEMS due to their high cost relative to parametric monitors. Also, the final rule does not require continuous monitoring to demonstrate compliance with the opacity standard. However, the rule has been revised to allow CEMS (and COMS, if used), and their applicable performance specifications in 40 CFR part 60, Appendix B, in the list of acceptable monitoring systems. These changes in the rule allow facilities to use CEMS (and COMS) to demonstrate continuous compliance without first obtaining the approval from the Administrator to use an alternative to the monitoring requirements specified in the final rule.

2.5.6 Electrostatic Precipitator Monitoring Parameters

Comment: One commenter (IV-D-11) noted that the proposed rule requires a facility using an electrostatic precipitator (ESP) to control PM to monitor both the inlet gas temperature and pressure drop. The commenter stated that the facility should not necessarily be required to

monitor both and asserted that monitoring temperature alone is often adequate to demonstrate that an ESP is functioning properly. The commenter suggested that EPA modify the rule so that a facility using an ESP as a PM control device can select which parameters are appropriate for demonstrating compliance and have those parameters approved by EPA in the same manner as "other" control devices. The commenter provided the following suggestions for specific changes to Table 3 of the proposed rule:

The "For" column for item 2 should read, "Filter-type particulate matter control devices."

The "For" column for item 3 should read, "Electrostatic precipitators and all other control devices other than thermal oxidizers or filter-type particulate matter control devices."

Response: The EPA agrees that ESPs operate differently from filter-type PM control devices and that parameters other than pressure drop could be used to show proper ESP operation. For these reasons, an alternative has been provided in the rule to allow facilities using an ESP to monitor the voltage going to the ESP instead of the pressure drop across the device. The voltage going to the ESP is a direct measure of the corona field responsible for ionizing PM as it passes through the ESP. The value or range of ESP voltage must be determined during the performance test.

2.5.7 Use of Manufacturer's Guarantees of Performance

Comment: One commenter (IV-D-11) suggested that, for measuring the differential pressure to demonstrate compliance with a PM operating limit, facilities should be allowed to either develop a differential pressure monitoring parameter during a performance test (as in the proposed rule) or follow the manufacturer specifications for the control device. The commenter explained that the latter option is important because the functionality of a filter-type PM control device is defined by the filter manufacturer in terms of an operating range for differential pressure. The commenter contended that operating within these ranges, which will require timely replacement of filters as well as proper operation and maintenance of the unit will result in compliance with the NESHAP. The commenter provided the following information regarding filter-type particulate matter control devices:

- their manufacturer can provide an operating range of differential pressure for each specific application.

- currently, they are guaranteed by the manufacturer to deliver opacity and PM control in compliance with the emission limitations of the proposed NESHAP operating up to a pressure drop up to ten inches of water but can deliver compliance at pressure drop levels greater than the guarantee.
- filters last several years before reaching the pressure drop limit but are usually changed out prior to meeting the limit to ensure compliance.

The commenter discussed the fact that, unless the deadline for conducting a performance test corresponded to the end of the filter life, the facility would have to test at a pressure drop below the manufacturer's guarantee. To comply with the NESHAP, the commenter explained, the facility would have to replace the filter once the operating pressure drop reached the pressure drop at which testing was conducted even though the control device could ensure compliance well into the future. The commenter stated that filter replacement can cost $100,000 per event. The commenter estimated that the associated costs of replacing filters would be enormous if testing is conducted shortly after filter replacement and there would be no corresponding increase in HAP removal. The commenter proposed that alternatively, if the facility wished to use filters for their entire life, it would have to petition EPA and/or the state agency to go beyond the test pressure drop and bear the significant cost of re-testing. The commenter contended that the proposed testing requirements do [not] take into account the actual operating methodology for filter-type PM control devices and penalize the facility for using a technology shown to deliver compliance. To address these deficiencies, the commenter suggested the following method of determining operating parameters:

1. Performance testing should require only monitoring of influent temperature. The commenter contended that, as recognized in NSPS subpart UU, the temperature of the influent stream is more critical than the operating pressure drop to ensure compliance. The commenter noted that this would make the NESHAP consistent with NSPS subpart UU while ensuring compliance with the MACT standards.

2. As in NSPS subpart UU, the commenter said that as long as the operating influent emissions temperatures are within a reasonable percentage considering the range of ambient temperature variation (for example, 10 percent) above the temperature during performance testing, the facility would be considered in compliance. If the operating influent emissions temperatures are greater than the percentage above the temperature during performance testing, EPA and the state would have the discretion to either (1) require re-testing or (2)

allow the facility to continue operations based on the results of the original testing. EPA should also allow the facility to delay any re-testing until the hottest part of the summer to prevent the facility from having to conduct additional tests due to increase in ambient air temperature and the results on the influent emissions stream temperature.

The commenter provided specific recommendations for revised language for section 63.8687 (a). The commenter concluded that making their suggested changes will reduce the cost of compliance while ensuring the emission limitations are met.

Response: The EPA contends that both the inlet gas temperature and the pressure drop across the control device are important parameters for determining if a filter-type PM control device is operating properly. A lower inlet gas temperature will cause more condensation of organic compounds thereby increasing their removal in the PM control device. A certain amount of pressure drop is needed by filter media to be effective in removing PM. However, too little or too great a pressure drop across the device will reduce the collection efficiency of the device. The EPA does not agree that, in this instance, manufacturer's guarantees will adequately ensure that emission limits are being achieved since the manufacturer's guarantees are not based on site-specific performance test data.

The EPA also does not believe that it is necessary to correlate the inlet gas temperature range to the ambient temperature. No such provision is included in the asphalt NSPS. With regard to the timing of performance tests, existing facilities are provided 3 years and 180 days after the promulgation date of the final rule to install controls and conduct their performance tests. The EPA believes this is sufficient time for facilities to schedule their performance test to account for variations in filter pressure drop and ambient temperatures.

2.5.8 Site-specific Monitoring Plan

Comment: One commenter (IV-D-03) stated that site-specific monitoring plans should not be required for continuous temperature indicators used to monitor combustion devices. The commenter explained that temperature indicators have been used for decades and experience has proven them to be accurate, reliable, and durable. The commenter asserted that other MACT standards do not require continuous temperature indicators. The commenter concluded that the requirement to develop a site-specific monitoring plan for temperature monitors is unwarranted

and suggested that, to ensure accuracy, the rule could specify an accuracy requirement and/or a minimum frequency for the data recorder (for example, once every 15 seconds).

Response: Continuous temperature monitors are not maintenance-free devices. They require periodic inspection, maintenance, and calibration to ensure continued accuracy. The EPA believes the proposed requirements for site-specific monitoring plans are reasonable and contends that the information required in the site-specific monitoring plans is necessary for regulators to ensure that the monitoring equipment are properly installed and maintained. The required information provides a written record of the calibration, maintenance, data quality, and recordkeeping and reporting procedures to be followed by the facility. The EPA disagrees with the commenter that other MACT standards have not required continuous temperature indicators. This requirement has been used in many NESHAP (e.g., subpart S and subpart NNN).

2.6 OPERATING LIMIT DEVIATIONS

2.6.1 Format of the Proposed Rule

Comment: One commenter (IV-D-11) stated that allowing nearly all deviations from operating limits (all except those that occur during periods of startup, shutdown, and malfunction) to be treated as violations of the standards is excessively harsh. The commenter contended that several factors make it probable that established operating parameters will be exceeded at times when a facility is operating its processes and control equipment well. The commenter argued that the proposed approach is inconsistent with the approach established in the compliance assurance monitoring (CAM) rule (40 CFR part 64) and the wool fiberglass manufacturing NESHAP (40 CFR part 63, subpart NNN).

The commenter stated that several ARMA members also manufacture fiberglass and comply with subpart NNN. The commenter explained that under the CAM rule and subpart NNN, the facility is given a chance to quickly correct a deviation from operating limits before a violation is registered. The commenter observed that the CAM rule recognized that this type of approach is particularly appropriate when using operating limits because regulatory emissions limits may not have exceeded limits even though the operating limits have. The commenter added that this approach provided powerful incentives for a source to take "corrective action" swiftly by implementing its Quality Improvement Plan (QIP) so that normal operations and

emissions can be restored. The commenter urged EPA to adopt similar provisions for subpart LLLLL. The commenter contended that the inconsistent approaches between the two MACT standards is evidence that EPA's actions in writing the asphalt NESHAP compliance provisions were arbitrary, especially because the differences in the two rules are unexplained.

The commenter offered suggestions for specific changes to the rule, and noted that additional changes may be needed to make the compliance provisions consistent with the CAM/QIP approach. The commenter concluded that there is no need for a finding of violation when the facility takes corrective action in the way proposed. The commenter argued that findings of violation should be saved for situations in which a facility (1) does not correct the problem in a speedy manner, or (2) exceeds the operating limits for a significant percentage of the time during a 6-month block period.

Response: The EPA disagrees with the commenter's suggestion that the monitoring provisions in the proposed rule were arbitrary and that the proposed rule should be revised to clarify that deviations from monitoring parameters do not always constitute a violation of the standard. The asphalt NESHAP specifies the emission limits and operating limits that must be met by subject facilities. However, the determination of what emission or operating limit deviations constitute violations of the standard is up to the discretion of the entity responsible for enforcement of the standards.

The commenter's reference to the CAM is incorrect since that rule does not apply to emission limitations or standards proposed by the Administrator after November 15, 1990. With regard to the commenter's assertion that the proposed NESHAP was inconsistent with the wool fiberglass manufacturing NESHAP, EPA is not required to maintain consistency among NESHAP and EPA does not believe that the inconsistency cited by the commenter acts as a disincentive to making corrective actions in a timely manner. The EPA notes that a facility is not precluded from developing a QIP or similar requirement to follow in case of monitoring parameter deviations encountered under this NESHAP. The EPA also agrees with the commenter that the speed and effectiveness with which a facility responds to a monitoring parameter deviation should be taken into consideration when assessing if a violation of the standard has occurred.

2.6.2 Monitoring Parameter Deviations During Periods of Startup, Shutdown, and Malfunction

Comment: One commenter (IV-D-11) expressed support for the provisions ensuring that a facility will not be in violation during startup, shutdown, or malfunction (SSM) as long it operates in accordance with its SSM plan. The commenter stated that this is a wise policy, consistent with sections 63.6 (e) and 63.7 (3)(a) of the General Provisions, and almost certainly required as a legal matter. The commenter noted that courts have acknowledged that technology is bound to fail at times and technology-based standards must account for such inevitable failures, citing Essex Chem. Corp v. Ruckelshaus, 486 F.2d 427, 432 (D.C. Cir. 1973).

Response: The SSM requirements are retained in the final rule. However, it should be noted that following the procedures specified in a deficient or inadequate SSM plan would not constitute compliance if the source were not minimizing emission consistent with good air pollution control practices.

2.7 COMPLIANCE DATES

2.7.1 New sources

Comment: One commenter (IV-D-11) pointed out that because the provisions of the NESHAP become effective three years after publication of the final rule (the effective date), new or reconstructed sources built prior to that date would need to comply with both the NSPS and the NESHAP until the effective date. The commenter explained that a facility built a year after the publication of the final rule would have to comply with the NESHAP and the less stringent but different provisions of the NSPS and two sets of notification, recordkeeping, and reporting requirements during the two years prior to the effective date. The commenter stated that this does not make sense. The commenter recommended that EPA amend section 63.8681 (b) to provide that following startup, blowing stills, storage tanks, saturators, and coaters at a new or reconstructed affected facility need only comply with the asphalt roofing NESHAP standards.

Response: The EPA recognizes that there was an inconsistency in the proposed rule between when new or reconstructed sources are required to be in compliance with the NESHAP and when facilities subject to both the NESHAP and the asphalt NSPS could comply with only the NESHAP. New or reconstructed sources are required to be in compliance with the NESHAP

either by publication of the final rule (if they startup prior to publication of the final rule) or at startup (if they startup after publication of the final rule).

It was not EPA's intent that facilities be required to demonstrate compliance with both the NSPS and the NESHAP where the standards overlap. The intent was to allow facilities that are subject to both the asphalt NSPS and this NESHAP to demonstrate compliance with this NESHAP only. Paragraph section 63.8681 (b) has been clarified to specify that the provisions of section 63.8681 (b) apply after the applicable compliance date specified in section 63.8683 for existing and new sources.

2.7.2 Existing Sources

Comment: One commenter (IV-D-11) supported allowing facilities three years to comply with the NESHAP following publication of the final rule. The commenter stated that it will take many facilities that long to carry out compliance planning, purchase necessary control and monitoring equipment, install equipment and associated ductwork, and fine-tune equipment so that compliance can be achieved.

Response: The compliance period has been retained in the final rule.

2.7.3 Testing

Comment: One commenter (IV-D-11) expressed concern with the requirement to conduct performance testing before the compliance date. The commenter stated that the General Provisions and nearly all previously-issued MACT standards allow the test to be conducted within 180 days of the compliance date (existing sources) or startup (new sources). The commenter asserted that the earlier testing requirement, which is eight months earlier than what is provided in the General Provisions, would create several problems:

- it would not provide adequate time to work through normal "shakeout" problems following installation of a new control and monitoring equipment.
- it would restrict the season during which the facility can conduct performance tests. The commenter explained that companies can not be expected to be in compliance with the standards until close to the compliance date, and if this date is in winter, spring or early summer, facilities will be forced to carry out testing when it is cold or cool outside,

raising safety concerns for the testing crew. The commenter added that, because operating limits for PM control devices include a maximum temperature, the PM control device testing should be conducted in the summer because the maximum operating temperature can be affected by ambient temperature. The commenter contended that, as facilities must conduct testing using the product that is expected to result in the highest emissions, they must also conduct testing during the time that presents the worst compliance situations.

The commenter stated that facilities need flexibility on the timing of performance tests and suggested allowing performance tests to be conducted by the later of (1) August 15 following the compliance date for existing sources or (2) 180 days following the compliance date for existing sources. The commenter explained that the latter would allow facilities to "work out the bugs" after installation of control equipment, computers, and software in the event that the compliance date is in the spring or summer prior to August 15. The commenter stated that, at a minimum, facilities should be given the opportunity to carry out their performance tests with 180 days of the compliance date (for existing sources) or the startup date (for new sources) as in the General Provisions and many other MACT standards. The commenter concluded that, based the problems they found with the testing date requirements and because EPA has acted differently in this proposal than in the General Provisions and other MACT standards, without providing an explanation, the proposed performance test deadline is arbitrary. The commenter recommended that EPA rewrite section 63.8686 (a) to state: "For existing affected sources, you must conduct performance tests no later than (1) the first August 15 following the compliance date that is specified for your source in section 63.8683, or (2) 180 days following such compliance date."

Another commenter (IV-D-14) argued that there is no reason for EPA to require the performance tests be completed 60 days prior to the compliance date and doing so effectively moves up the compliance date for facilities that must test. The commenter stated that the requirement should be revised to be consistent with other NESHAP and require testing within 180 days of the compliance date.

Response: The EPA agrees with the commenter that some time period is necessary to ensure control equipment is working properly. Because the rule allows up to three years to install controls, EPA agrees that 180 days after that would be sufficient time to allow owners and

operators to "get the bugs out" and to allow for variations in weather and ambient temperature. Therefore, the rule has been revised to specify that initial performance tests for existing affected sources must be conducted no later than 180 days following the compliance date.

2.8 EMISSIONS AVERAGING

Comment: One commenter (IV-D-11) asserted that, in cases when a facility will employ several control devices to comply with the NESHAP, they should be given the options of demonstrating compliance by "averaging" the performance of the various control devices. The commenter argued that this approach would somewhat ameliorate the inequities arising from EPA's flawed approach for defining the MACT floors on individual process units rather than on entire facilities (see section 2.3.1). As an example, the commenter proposed that if one thermal oxidizer at a facility operates at more than 1°F above its operating limit, another thermal oxidizer treating a gas stream with comparable volume of emissions should be able to operate at 1° less than its operating limit. The commenter contended that averaging in this way would promote economic efficiency by allowing facilities to achieve the most cost-effective emissions reductions while at the same time achieving at least the same overall emission reductions that would be realized without averaging. The commenter expressed willingness to work with EPA to help devise an averaging system that is flexible yet ensures compliance with the MACT standards. The commenter stated that there is ample precedent for averaging to meet MACT standards, citing the MACT standards for primary aluminum reduction plants (40 CFR part 63, subpart LL), synthetic organic chemical manufacturing, and other industries.

Response: Emissions averaging is accomplished by balancing HAP emissions or emission reductions across a set of regulated emission points. Averaging of control device operating parameters is not valid because no precise relationship exists between operating parameters and mass emissions across this industry. Using the example provided by the commenter, EPA has not found that HAP destruction in thermal oxidizers necessarily increases with increased temperature once the oxidizers are operating above 1200°F. Moreover, EPA does not have sufficient test data to develop HAP mass emission factors for use in demonstrating compliance with an emissions averaging program. Consequently, neither parametric averaging nor emissions averaging is allowed in the final rule.

2.9 EMISSION DATA

Comment: One commenter (IV-D-11) disagreed with EPA's statement in the preamble that "[u]nfortunately, the majority of the speciated HAP data collected from the [joint EPA-ARMA] test program were not valid due to calibration errors during testing" and a memo (Docket item II-B-18) with similar assertions. The commenter expressed confidence that the speciated data are valid, noting that the testing was done with EPA contractors using EPA methods following a test plan reviewed by EPA contractors and reviewed and approved by EPA. The commenter also noted that the wet chemistry data and most data collected using the Fourier transform infrared (FTIR) method were within quality assurance/quality control (QA/QC) limits. The commenter contended that the only questionable data were collected in 1995 at the CertainTeed facility in Shakopee, Minnesota using the FTIR method, which the test report noted required further development. The commenter argued that significant advances have been made with the FTIR method and more recent testing (in 1998 and 1999) showed consistent results for similar sources while the results were significantly different from the 1995 results. The commenter questioned why EPA did not incorporate the 1998 and 1999 data into analyses and only used 1995 data. The commenter noted that they provided a rebuttal to EPA's concern regarding the FTIR method results and provided the those rebuttals again as attachment to their comments. The commenter concluded that, with the exception of early FTIR testing at the Shakopee facility, test results from EPA-ARMA testing program are valid and recommended that EPA correct assertions on test data validity in the proposal.

Response: The EPA reviewed the commenter's response, but continues to assert concerns regarding data quality discussed in the proposed preamble and public docket memoranda. A high level of confidence in the test data is necessary for EPA to establish a regulatory emission limit based on that data. While EPA believes that FTIR is a valid method of assessing emissions from these sources, the questions of accuracy of the test results makes them inappropriate for use in setting emission limits. While EPA did not find the data of adequate quality to use for establishing emission limits, we did consider it sufficiently accurate for use in estimating baseline emissions for the industry. Baseline emission estimates are approximations used to assess the emission reductions achieved by the rule and do not have direct regulatory

significance, whereas a greater degree of accuracy is required for data used to establish the level of the standards.

2.10 RULE IMPACTS

2.10.1 Compliance Cost Estimates

Comment: One commenter (IV-D-07) reported that EPA's assumption that capital and annualized costs for petroleum refineries to comply with the proposed rule would be less than for roofing manufacturing facilities is inaccurate. The commenter stated that, as proposed, the rule has the potential to cause some companies to go out of business.

Another commenter (IV-D-14) argued that EPA's estimate of compliance costs is unrealistically low and virtually ignores the cost to petroleum refineries. The commenter reported that replacement of an existing thermal incinerator to control emissions from a blowing still would cost $1.5 million. This cost does not include extensive modifications to existing piping. The commenter added that the cost of a new installation, including foundations, piping, utilities, instrumentation, and electrical would be substantially higher. The commenter stated that the fact that the cost for one facility almost equals the total industry cost estimated by EPA is an indication of EPA's under-estimation. The commenter also provided cost information for piping to control storage vessels and loading racks, arguing that these costs are not negligible. The commenter explained that the cost of piping and blowers to control 28 storage vessels and 4 loading racks at a single facility was greater than $1 million. The commenter contended that the amount of piping, steam tracing, pressure control and ancillary equipment required to install a complex network of vapor collection piping and operate it safely to avoid hydrocarbon condensation and plugging and minimize the risk of explosion and flame propagation is significant.

One commenter (IV-D-28) expressed the concern that EPA has focused on distance to control devices as the sole determinant of the feasibility and cost impacts of the rule. The commenter contended that such a focus ignores complex safety and engineering concerns including whether:

a. existing control devices have the hydraulic capacity to handle additional vapors

b. existing control devices are sized to handle the increased thermal loads associated with increased firing to combust the incremental vapors

c. existing control devices have sufficient fuel system capacity to maintain the required temperatures to meet the proposed emissions limits

d. additional vapor transport systems (blowers, compressors) are needed to move vapors from storage tanks or loading racks to the control devices

e. incremental steam or electrical heating is needed to ensure that lines are not plugged by condensation of vapor components. This also increases electrical and/or fuel demands at the plant that may necessitate permitting and upgrading boilers or other units

f. additional instrumentation to monitor and control the tanks, loading racks, vapor transport lines and vapor blowers

g. upgrades and improvements to tank safety systems are needed to address potential tank collapse or rupture caused by the vapor transport system

The commenter provided information on a 2000-2001 emission control project to collect asphalt blowing still, storage tank, and loading rack vapors at an asphalt processing facility collocated adjacent to a petroleum refinery. The commenter reported that the capital cost for the vapor handling system was $1 million, a new thermal oxidizer needed to handle the higher vapor load was $1.5 million.

One commenter (IV-D-15) stated that EPA drastically underestimated the potential impact of the regulation and expressed the concern that compliance costs could force them out of the blown asphalt processing business (either for the roofing market and/or the protective coatings market, depending on interpretation of the regulation.) The commenter estimated that compliance costs may approach the gross annual sales for the protective coatings market. The commenter contended that their facility has a major impact on roofing manufacturing in four states. The commenter predicted that downstream customers will be adversely impacted if the roofing and protective coatings markets are no longer viable for them.

One commenter (IV-D-28) asserted that EPA failed to adequately assess the economic impacts of the proposal by underestimating the number of asphalt processing facilities located at or collocated with petroleum refineries.

Response: At proposal, capital and annual costs were not estimated for asphalt processing operations that are located at petroleum refineries because we did not have data on actual production rates for blowing stills or the populations, capacities, and types of control devices used for storage tanks and loading racks. Although no detailed process or cost estimate data were submitted by the petroleum refining industry following proposal, EPA has developed control cost estimates for asphalt processing operations at petroleum refineries using information contained in a 2000 *Oil & Gas Journal* survey, supplemented by storage tank data from the petroleum refinery NESHAP database.

Based on the data in the *Oil & Gas Journal* survey, only four blowing stills at a single petroleum refinery are not controlled with a combustion device. Therefore, a cost estimate was developed for insulated ductwork and a stand-alone thermal oxidizer for these blowing stills. For asphalt storage tanks and loading racks, as discussed in section 2.3.4.2, the final rule includes a vapor pressure cutoff. Tanks above a specified size cutoff storing asphalt with a vapor pressure equal to or greater than 10.4 kPa must be controlled with a combustion device; tanks storing asphalt with a vapor pressure less than 10.4 kPa must be controlled with a PM control device that meets the emission limits specified in the asphalt NSPS (40 CFR part 60, subpart UU). Based on the data from the petroleum refinery NESHAP database, none of the asphalt storage tanks at petroleum refineries are expected to exceed the vapor pressure cutoff of 10.4 kPa. Accordingly, since none of the asphalt storage tanks at petroleum refineries exceed the vapor pressure cutoff, we assumed that asphalt loading racks at petroleum refineries do not transfer asphalt with a vapor pressure of 10.4 kPa or greater. Consequently, the cost estimates were developed for ductwork and a PM control device for asphalt storage tanks at petroleum refineries. No control costs were estimated for asphalt loading racks.

2.10.2 Compliance Cost Estimates

Comment: One commenter (IV-D-07) pointed out that the proposed rule would result in a decrease in HAP emissions of 9.78 tons per year. The net result would be an increase in total emissions, due to increases in nitrogen oxides (NO_X), CO, and sulfur dioxide (SO_2), which exceed the decrease in HAP emissions. The commenter estimated that the increased use of

natural gas for combustion controls will result in emissions of more than 700 tons per year of carbon dioxide (CO_2), a greenhouse gas.

Response: The EPA reported in the proposal preamble that some criteria pollutants will increase (less than 100 tons per year of SO_2, CO, and NO_x combined) due to control requirements. The emission impacts have been revised for the final rule to include the emission reductions achieved by controlling emissions from uncontrolled blowing stills at a petroleum refinery and to reflect the changes in the level of control for storage tanks and loading racks handling low-vapor pressure asphalt (see section 2.3.4.2). The total HAP reduction resulting from compliance with the final rule is expected to be approximately 95 tons per year. The final rule will also achieve reductions of PM but sufficient data is not available for EPA to quantify that reduction. The estimated increases of NO_x, CO, and SO_2 are approximately, 476, 799, and 6 Mg/yr (524, 880, and 6 tpy), respectively (CO_2 was not accounted for because CO_2 is not a pollutant that is regulated under the CAA.). These estimates are based on the amount of exhaust and auxiliary fuel that will be burned at the asphalt processing and asphalt roofing manufacturing facilities that are estimated to be major sources.

2.10.3 Cost-effectiveness of Proposed Rule

Comment: One commenter (IV-D-07) found the costs associated with the rule as proposed to be excessive. The commenter stated that the cost per ton of HAP reduction exceeds that of previous NESHAP and is inconsistent with EPA-established guidelines of $10,000 per ton.

Response: Standards for existing equipment are based on the MACT floor level of control and costs may not be considered in determining the MACT floor. National Lime v. EPA, 233 F. 3d at 640. The EPA rejected beyond-the-floor control options (thermal oxidation for saturators, wet loopers, coaters, coating mixers, and sealant and adhesive applicators at existing sources, and scrubbing of emissions of blowing stills that use chlorinated catalysts) based on excessive costs. The only beyond-the-floor option that was adopted was for wet loopers at new or reconstructed sources, which must be controlled with a thermal oxidizer or equivalent control. The costs of this option are considered to be insignificant in comparison to the cost of routing the other regulated emission points at new or reconstructed sources to a thermal oxidizer or

equivalent control. (See the memorandum "Documentation of Existing and New Source Maximum Achievable Control Technology (MACT) Floors for the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Asphalt Processing and Asphalt Roofing Manufacturing" (Docket No. A-95-32).)

2.10.4 Thermal Oxidizer Cost Estimates

Comment: One commenter (IV-D-11) stated that EPA significantly underestimated capital costs for thermal oxidizers causing the cost effectiveness numbers reported by EPA to be too low. The commenter submitted additional information on thermal oxidizer costs in appendix C of their comments.

Response: The EPA has reviewed both the capital and annual costs submitted by the commenter and compared them to those estimated by EPA. The capital costs match closely with those submitted by the commenter when considered in terms of dollars per standard cubic feet of gas controlled. This is not surprising as most capital costs for control equipment are directly proportional to the volume of gas being controlled. The gas stream flow rates used to size the thermal oxidizers were estimated using emission factors developed from the EPA/ARMA test data. Annual costs estimated by EPA were actually higher than those estimated by the commenter. Consequently, the methodology for estimating the cost of thermal oxidizers has not been revised.

2.11 OVERLAP WITH OTHER RULES

2.11.1 New Source Performance Standards for Petroleum Refineries

Comment: Two commenters (IV-D-04; IV-D-07) suggested that EPA should make it clear that a vent stream that is controlled in a combustion device is not considered a "fuel gas" subject to the NSPS for Petroleum Refineries (40 CFR part 60, subpart J). One commenter (IV-D-07) contended that blowing still emissions will not meet the sulfur requirements in subpart J and that it would be impractical to scrub the emissions to meet the sulfur specification. The commenter argued that subpart J should not apply because the purpose of combusting the vapor streams is to destroy HAP, not to recover energy as fuel.

Another commenter (IV-D-03) stated that it is impractical to subject emissions from asphalt blowing stills to subpart J. The commenter stated that vapors from asphalt oxidizers cannot be treated by sour gas treatment systems due to the oxygen and particulate content of the vapors. The commenter said that regardless of the applicability of the proposed MACT to refineries, an exemption from subpart J for thermal oxidizers used to control asphalt blowing stills at refineries is needed.

Response: The EPA disagrees with the commenters that blowing still emissions would be subject to the fuel gas requirements of 40 CFR part 60, subpart J (Standards of Performance for Petroleum Refineries) because asphalt processing plants are not considered to be part of a petroleum refinery. However, to avoid possible confusion regarding this issue, the final rule has been revised to specify that vent gases from asphalt blowing stills would not be subject to the fuel gas requirements of 40 CFR part 60, subpart J.

2.11.2 New Source Performance Standards for Asphalt Processing and Asphalt Roofing Manufacturing

Comment: One commenter (IV-D-11) applauded EPA for including a provision allowing blowing stills, storage tanks, and saturators subject to both the proposed NESHAP and NSPS 40 CFR part 60, subpart UU to be in compliance with both by complying only with the NESHAP. The commenter stated that requiring compliance with two sets of standards and two sets of paperwork requirements would produce no environmental benefits and would be costly for their members. Another commenter (IV-D-03) contended that compliance with NSPS 40 CFR part 60, subpart UU for blowing stills and storage tanks should constitute compliance with the proposed NESHAP. The commenter stated that previously issued MACT standards have allowed this approach.

Response: The EPA disagrees with the commenter that suggested that compliance with NSPS 40 CFR part 60, subpart UU should constitute compliance with the proposed NESHAP. Compliance with the asphalt NESHAP will ensure compliance with the asphalt NSPS because the NESHAP standards (reduce total hydrocarbons by 95 percent or use a thermal oxidizer that achieves a combustion efficiency of 99.5 percent) are based on the performance of a thermal oxidizer which reduces both PM and THC (surrogates for particulate and gaseous organic HAP).

The PM emission limits specified in subpart UU are based on the performance of PM control devices (e.g., high-velocity air filters), which are not effective at reducing gaseous THC emissions. Therefore, demonstrating compliance with the PM emission limits of subpart UU does not ensure compliance with the THC or combustion efficiency requirements of proposed NESHAP.

2.11.3 National Emission Standard for Hazardous Air Pollutants from Petroleum Refineries

Comment: One commenter (IV-D-14) stated that the rule should be clarified so that asphalt flux and oxidized asphalt storage tanks already regulated under another MACT rule (for example, the petroleum refineries NESHAP) are not further regulated under the asphalt NESHAP.

Response: The EPA recognizes that asphalt flux storage vessels could be subject to the petroleum refinery NESHAP and the asphalt NESHAP as it was proposed. Storage vessels are subject to the petroleum refinery NESHAP if they are associated with a process unit that is subject to the petroleum refinery NESHAP. The distillation units that produce the asphalt flux are subject to the petroleum refinery NESHAP, therefore the vessels storing flux are also subject to the petroleum refinery NESHAP.

Because they provide the feed for blowing operations, the asphalt flux storage vessels are also associated with the asphalt blowing units, which are not subject to the petroleum refineries NESHAP. However, the petroleum refineries NESHAP states that when a storage vessel is shared among process units and no single unit uses it predominantly, and one of the units is subject to the petroleum refineries NESHAP, the tank is subject to the petroleum refineries NESHAP. The EPA also recognizes that storage tanks at asphalt processing and asphalt roofing manufacturing facilities could be subject to the standards of performance for storage vessels (40 CFR part 60, subparts K, Ka, and Kb). Consequently, the final rule has been revised to specify that the NESHAP does not apply to any equipment that is subject to the petroleum refinery NESHAP (40 CFR part 63, subpart CC) or subparts K, Ka, or Kb of part 60.

2.11.4 Asphalt Processing Collocated with a Petroleum Refinery

Comment: One commenter (IV-D-28) suggested that, because straight run asphalt and asphalt flux are normal products from many refineries, EPA should:

- Harmonize the petroleum refineries NESHAP and the asphalt NESHAP rules to the greatest extent possible where facilities must meet requirements of both MACT rules.
- Ensure that one facility is not penalized simply because it is collocated with another.

The commenter argued that the proposed rule achieves neither of these goals and will result in serious inconsistencies for petroleum refineries that are or are collocated with asphalt processing facilities. The commenter claimed that these inconsistencies are most serious in regards to storage vessel and loading rack requirements. The commenter stated that eliminating these inconsistencies and clarifying the applicability of emission limits will eliminate the need to determine the "dividing line" between petroleum refineries NESHAP and the asphalt NESHAP.

Response: Revisions have been made to the final NESHAP that address the potential overlap of control requirements between the petroleum refinery NESHAP and the asphalt processing and asphalt roofing manufacturing NESHAP. First, control options for combustion devices (e.g., process heaters, boilers, flares) that mirror the requirements in the petroleum refinery NESHAP have been added to the final rule. Second, a vapor pressure control cutoff for asphalt storage tanks and loading racks that is the same as that specified in the petroleum refinery NESHAP has been added to the final rule.

2.12 HEALTH EFFECTS

2.12.1 Exposure Levels at Asphalt Processing and Asphalt Roofing Manufacturing Facilities

Comment: Four commenters (IV-D-09; IV-D-11; IV-D-12; IV-D-27) argued that statements in the preamble to the proposed rule concerning health effects are incorrect and misleading. The commenters contended that the health effects described would not be present when persons are exposed to HAP at the concentration emitted by asphalt processing facilities. Three commenters (IV-D-09; IV-D-11; IV-D-12) asserted that, because the title to the section of the preamble in question is titled "What are the Health Effects Associated With the Asphalt Processing and Asphalt Roofing Manufacturing Source Categories?," EPA must take into account low emissions and resulting minimal exposure associated with nearly all HAP emitted

from asphalt processing operations. One commenter (IV-D-12) recognized that at least some of the acute health effects described by EPA are documented in scientific literature when there is exposure to substances at high concentrations. The commenter did not dispute that chronic conditions described may result from repeated exposure at high concentrations, but asserted that none of the effects described in the proposal have been attributed in the scientific literature to asphalt at real world concentrations, conditions, and exposures.

The commenters provided several examples (summaries follow) and contended that they could make similar points to other HAP discussed in the preamble and recommended that EPA make it clear in the final rule that HAP concentration at asphalt processing facilities are not high enough to cause the health effects described in the proposal.

Two commenters (IV-D-09; IV-D-12) pointed out that irritation of mucous membranes, coughing, and bronchitis occur only when high concentrations of formaldehyde are inhaled and noted that workers at an asphalt processing facility should be exposed to less than the threshold level value (TLV) of 0.3 parts per million. The commenters concluded that exposure to the public would be significantly less and the effects described in the preamble would not be found in the vicinity of asphalt processing facilities.

Three commenters (IV-D-09; IV-D-11; IV-D-12) stated that acute exposures to very high levels of hexane are required to produce the cental nervous system and neuromuscular effects described in the preamble. The commenters argued that, if hexane were emitted from asphalt processing facilities, it would be in concentrations so minimal that none of the health effects described in the preamble would occur (IV-D-09; IV-D-11; IV-D-12).

Response: The preamble did not state, nor should it necessarily be inferred, that any specific health effects have been linked to emissions from asphalt processing or asphalt roofing manufacturing operations. The reported health effects are those associated with the pollutants emitted. The EPA agrees that the acute exposure effects result from much higher concentrations than are likely found around sources subject to this standard. At this time, no exposure or risk assessment has been conducted by EPA to evaluate the concentrations and exposures that are typically encountered in the asphalt processing and asphalt roofing manufacturing industry. Today's standards are based solely on technology. Health effects and risk assessments will be considered at the time the need for residual risk standards are evaluated for these industries.

2.12.2 Hexane Data

Comment: One commenter (IV-D-11) argued that there are no reliable data suggesting that hexane is emitted from asphalt processing and asphalt roofing manufacturing. The commenter speculated that EPA's belief that hexane is emitted is based on FTIR spectrometry data from emissions testing conducted at the CertainTeed plant in Shakopee, Minnesota. The commenter stated that they previously informed EPA that the results are inaccurate in their reporting of hexane emissions, citing a docket item No. II-D-29. The commenter explained that hexane was not actually measured during the testing. THC was measured and incorrectly recorded as "hexane" rather than as "THC as hexane." The commenter suggested that the final rule should clarify that there are no reliable data suggesting that hexane is emitted from either asphalt processing or asphalt roofing manufacturing operations. The commenter also recommended that a memorandum containing information on asphalt emissions be corrected.

Response: The March 18, 2001 memorandum cited by the commenter (Docket No. A-95-32, item II-D-29) only addresses hexane emissions from the August 1995 emissions test CertainTeed facility in Shakopee, Minnesota. The EPA notes that emissions testing of the CertainTeed facility in Oxford, North Carolina in 1999 shows that hexane was emitted from the blowing still thermal oxidizer outlet, asphalt storage tank, and coater. Also, the 1999 test of the U.S. Intec modified bitumen facility and in Port Arthur, Texas shows hexane emissions from the coater, mixing tank, and holding tank.

2.12.3 Formaldehyde Data

Comment: One commenter (IV-D-12) questioned the references to formaldehyde in the preamble, stating that, to their knowledge, peer-reviewed literature on emissions from asphalt processing operations does not indicate the presence of formaldehyde emissions.

Response: The estimates of formaldehyde emission are based on the ARMA/EPA test data, which show that formaldehyde is emitted from blowing stills, asphalt storage tanks, loading racks, coaters, coating mixers, saturators, and modified bitumen holding tanks.

2.13 CLARIFICATIONS AND CORRECTIONS

2.13.1 Preamble

Comment: One commenter (IV-D-11) stated that EPA should correct the reference in the preamble to the proposed rule to "roofing tar." The commenter asserted that there is no such substance known as roofing tar. The commenter noted that there is a substance known as "coal tar" that is not derived from petroleum and is not used by asphalt processing or asphalt roofing manufacturing operations. The commenter stated that the correct terminology for industry emissions is "asphalt emissions" not "roofing tar emissions." The commenter concluded that the preamble to the final rule and all supporting documentation should reflect this correction and the final rule preamble should acknowledge that t he proposal's reference to "roofing tar emissions" was mistaken.

Response: Roofing tar emissions are referred to in the preamble as a source of POM-bearing emissions, along with coke oven emissions and cigarette smoke, not as a type of emissions from asphalt processing and roofing manufacturing. Because the term has no bearing on the development or implementation of this rule, EPA does not intend to revise the preamble or supporting documentation.

2.13.2 Polycyclic Organic Matter

Comment: One commenter (IV-D-11) contended that estimates of polynuclear aromatic hydrocarbon (PAH) emissions used as surrogates for POM emissions in a 1997 emission inventory of "section 112 (c)(6) pollutants" were many times greater than actual emissions for asphalt processing operations. The commenter stated that they previously informed EPA that the PAH estimates were too high because the emission factor used was several orders of magnitude too high and the estimate was based on erroneous data concerning shingle production and the asphalt content of roofing materials. The commenter estimated that industry PAH emissions were less than 3 percent of the estimate. The commenter speculated that EPA recognized the errors based on EPA's current POM estimates, which are in the range of the commenter's estimates. The commenter asked EPA to clarify in the preamble to the final regulation that the PAH emission estimates for the asphalt processing industry found in the 1997 section 112 (c)(6) pollutant inventory are much too high. The commenter stated that erroneous data in the public

domain can cause real problems for their members. The commenter expressed particular concern regarding correction of the estimates because the amount of POM from an industry can have regulatory implications under section 112 (c)(6) and section 112 (k). The commenter also argued that POM emissions should not be included in the final rule preamble as one of the HAP that make up 98 percent of the total HAP emissions from the regulated source category because emissions are minute. The commenter added that the discussion of health effects of POM should be emitted from the preamble to the final rule.

Response: The estimate emissions of POM that were used for the 112 (c)(6) inventory have no bearing on the development of this rule. The estimates of the POM contribution to total HAP for this regulation is based on the results of the EPA/ARMA test program. The EPA contends that the promulgation preamble for this NESHAP is not the appropriate forum for evaluating comments made on another rulemaking. See National Lime v. EPA, 233 F. 3d at 641.

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

Final national emissions standards for hazardous air pollutants (NESHAP) for asphalt processing and asphalt roofing manufacturing are being promulgated under section 112 of the Clean Air Act. The standards were proposed in the Federal Register on November 21, 2001. This document summarizes all public comments on the proposals received by EPA. It also contains EPA's responses to the comments.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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