ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA–HQ–OAR–2018–0794; FRL–9988–93–OAR]

RIN 2060–AT99

National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units—Reconsideration of Supplemental Finding and Residual Risk and Technology Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing a revision to its response to the U.S. Supreme Court decision in *Michigan* v. *EPA* which held that the EPA erred by not considering cost in its determination that regulation under section 112 of the Clean Air Act (CAA) of hazardous air pollutant (HAP) emissions from coal- and oil-fired electric utility steam generating units (EGUs) is appropriate and necessary. After considering the cost of compliance relative to the HAP benefits of regulation, the EPA proposes to find that it is not ''appropriate and necessary'' to regulate HAP emissions from coal- and oil-fired EGUs, thereby reversing the Agency's prior conclusion under CAA section 112(n)(1)(A) and correcting flaws in the Agency's prior response to *Michigan* v. *EPA.* We further propose that finalizing this new response to *Michigan* v. *EPA* will not remove the Coal- and Oil-Fired EGU source category from the CAA section 112(c) list of sources that must be regulated under CAA section 112(d) and will not affect the existing CAA section 112(d) emissions standards that regulate HAP emissions from coal- and oil-fired EGUs. We are soliciting comment, however, on whether the EPA has the authority or obligation to delist EGUs from CAA section 112(c) and rescind (or to rescind without delisting) the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Coal- and Oil-Fired EGUs, commonly known as the Mercury and Air Toxics Standards (MATS). The EPA is also proposing the results of the residual risk and technology review (RTR) of the NESHAP that the Agency is required to conduct in accordance with CAA section 112. The results of the residual risk analysis indicate that residual risks due to emissions of air toxics from this source category are acceptable and that the current standards provide an ample margin of safety to protect public health. No new developments in HAP emission controls to achieve further cost-effective emissions reductions were identified under the technology review. Therefore, based on the results of these analyses and reviews, we are proposing that no revisions to MATS are warranted. Finally, the EPA is also taking comment on establishing a subcategory for emissions of acid gas HAP from existing EGUs firing eastern bituminous coal refuse.

DATES: *Comments.* Comments must be received on or before April 8, 2019. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best assured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before March 25, 2019.

Public Hearing. The EPA is planning to hold at least one public hearing in response to this proposed action. Information about the hearing, including location, date, and time, along with instructions on how to register to speak at the hearing, will be published in a second **Federal Register** document.

ADDRESSES: *Comments.* Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2018–0794, at *https://www.regulations.gov.* Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from *Regulations.gov*. See **SUPPLEMENTARY INFORMATION** for detail about how the EPA treats submitted comments. *Regulations.gov* is our preferred method of receiving comments. However, the following other submission methods are also accepted:

- *Email: a-and-r-docket@epa.gov.* Include Docket ID No. EPA–HQ–OAR–2018–0794 in the subject line of the message.
- *Fax:* (202) 566–9744. Attention Docket ID No. EPA–HQ–OAR–2018–0794.
- *Mail:* To ship or send mail via the United States Postal Service, use the following address: U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA–HQ–OAR–2018–0794, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.
- *Hand/Courier Delivery:* Use the following Docket Center address if you are using express mail, commercial delivery, hand delivery, or courier: EPA Docket Center, EPA WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. Delivery verification signatures will be available only during regular business hours.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact Mary Johnson, Sector Policies and Programs Division (D243–01), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–5025; fax number: (919) 541–4991; and email address: *johnson.mary@epa.gov* or Nick Hutson, Sector Policies and Programs Division (D243–01), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–2968; fax number: (919) 541–4991; and email address: *hutson.nick@epa.gov.* For specific information regarding the risk modeling methodology, contact Mark Morris, Health and Environmental Impacts Division (C539–02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–5416; and email address: *morris.mark@epa.gov.* For information about the applicability of the NESHAP to a particular entity, contact Sara Ayres, Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, U.S. EPA Region 5 (E–19J), 77 West Jackson Boulevard, Chicago, Illinois 60604; telephone number: (312) 353–6266; and email address: *ayres.sara@epa.gov.*

SUPPLEMENTARY INFORMATION:

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA–HQ–OAR–2018–0794. All documents in the docket are listed in *Regulations.gov.* Although listed, some information is not publicly available, *e.g.,* CBI (Confidential Business Information) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *Regulations.gov* or in hard copy at the EPA Docket Center, Room 3334, EPA WJC West Building, 1301 Constitution Avenue NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–1742.

Instructions. Direct your comments to Docket ID No. EPA–HQ–OAR–2018–0794. The EPA's policy is that all

comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *https://www.regulations.gov* or email. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.*

The *https://www.regulations.gov* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets.*

The EPA is soliciting comment on numerous aspects of the proposed rule. The EPA has indexed each comment solicitation with an alpha-numeric identifier (*e.g.,* ''C–1,'' ''C–2,'' ''C–3'') to provide a consistent framework for effective and efficient provision of comments. Accordingly, the EPA asks that commenters include the corresponding identifier when providing comments relevant to that comment solicitation. The EPA asks that commenters include the identifier in either a heading, or within the text of each comment (*e.g.,* ''In response to solicitation of comment C–1, . . .'') to make clear which comment solicitation is being addressed. The EPA emphasizes that the Agency is not limiting comment to these identified areas and encourages provision of any other comments relevant to this proposal.

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 Code of Federal Regulations (CFR) part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404–02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention Docket ID No. EPA–HQ–OAR–2018–0794.

Preamble Acronyms and Abbreviations. We use multiple acronyms and terms in this preamble. While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

AEGL acute exposure guideline level
AERMOD air dispersion model used by the HEM–3 model
ATSDR Agency for Toxic Substances and Disease Registry
CAA Clean Air Act
CalEPA California EPA
CAMR Clean Air Mercury Rule
CBI Confidential Business Information
CEMS continuous emissions monitoring systems
CFR Code of Federal Regulations
CPMS continuous parameter monitoring system
ECMPS Emissions Collection and Monitoring Plan System
EGU electric utility steam generating unit
EIA Energy Information Administration
EPA Environmental Protection Agency
EPRI Electric Power Research Institute
ERPG Emergency Response Planning Guideline
fPM filterable particulate matter
HAP hazardous air pollutant(s)
HCl hydrochloric acid
HEM–3 Human Exposure Model, Version 1.1.0
HF hydrogen fluoride
Hg mercury
HI hazard index
HQ hazard quotient
ICR information collection request
IGCC integrated gasification combined cycle
IRIS Integrated Risk Information System
km kilometer
lb/GWh pounds per gigawatt-hour
lb/MMBtu pounds per million British thermal units
lb/MWh pounds per megawatt-hour
lb/TBtu pounds per trillion British thermal units
MACT maximum achievable control technology
MATS Mercury and Air Toxics Standards
mg/m^3 milligrams per cubic meter
MIR maximum individual risk
MMBtu million British thermal units
MMBtu/hr million British thermal units per hour
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NEEDS National Electric Energy Data System
NEI National Emissions Inventory
NESHAP national emission standards for hazardous air pollutants
NO_X nitrogen oxides
NTTAA National Technology Transfer and Advancement Act
OAQPS Office of Air Quality Planning and Standards
OMB Office of Management and Budget
PB–HAP hazardous air pollutants known to be persistent and bio-accumulative in the environment
PDF Portable Document Format
PM particulate matter
$PM_{2.5}$ fine particulate matter
POM polycyclic organic matter
PRA Paperwork Reduction Act
RDL representative detection level
REL reference exposure level
RFA Regulatory Flexibility Act
RfC reference concentration
RfD reference dose
RIA regulatory impact analysis
RTR residual risk and technology review
SAB Science Advisory Board
SO_2 sulfur dioxide
TOSHI target organ-specific hazard index
tpy tons per year

TRIM.FaTE Total Risk Integrated Methodology.Fate, Transport, and Ecological Exposure model
UARG Utility Air Regulatory Group
UF uncertainty factor
μg/m^3 microgram per cubic meter
UMRA Unfunded Mandates Reform Act
URE unit risk estimate
USGS United States Geological Survey

Organization of this Document. The information in this preamble is organized as follows:

I. General Information

A. Does this action apply to me?

Table 1 of this preamble lists the NESHAP and associated regulated industrial source categories that are the subject of this proposal. Table 1 is not intended to be exhaustive, but rather provides a guide for readers regarding the entities that this proposed action is likely to affect. The proposed standards, once promulgated, will be directly applicable to the affected sources. Federal, state, local, and tribal government entities that own and/or operate EGUs subject to 40 CFR part 63, subpart UUUUU would be affected by this proposed action. The Coal- and Oil-Fired EGU source category was added to the list of categories of major and area sources of HAP published under section 112(c) of the CAA on December 20, 2000 (65 FR 79825). CAA section 112(a)(8) defines an electric utility steam generating unit as: *Any fossil fuel fired combustion unit of more than 25 megawatts that serves a generator that produces electricity for sale. A unit that cogenerates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 megawatts electrical output to any utility power distribution system for sale* is also considered an EGU.

TABLE 1—NESHAP AND INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS PROPOSED ACTION

Source category	NESHAP	NAICS code [1]
Coal- and Oil-Fired EGUs	40 CFR part 63, subpart UUUUU	221112, 221122, 921150

[1] North American Industry Classification System.

B. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this action is available on the internet. Following signature by the EPA Administrator, the EPA will post a copy of this proposed action at *https://www.epa.gov/mats/regulatory-actions-final-mercury-and-air-toxics-standards-mats-power-plants.* Following publication in the **Federal Register**, the EPA will post the **Federal Register** version of the proposal and key technical documents at this same website. Information on the overall RTR program is available at *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html.*

II. Appropriate and Necessary Finding

A. Overview

The EPA proposes this revised action in response to the U.S. Supreme Court decision in *Michigan* v. *EPA,* 135 S.Ct. 2699 (2015), which held that the EPA erred by not considering cost in its determination that regulation of HAP emissions from coal- and oil-fired EGUs is appropriate and necessary under CAA section 112. In this action, after considering the cost of compliance relative to the HAP benefits of regulation, the EPA proposes to find that it is not ''appropriate and necessary'' to regulate HAP emissions from coal- and oil-fired EGUs, thereby reversing the Agency's conclusion under CAA section 112(n)(1)(A), first made in 2000 and later affirmed in 2012 and 2016. This proposed response corrects flaws in the EPA's prior 2016 response to *Michigan* (82 FR 24420) and, if finalized, would supplant that 2016 action. We also propose that finalizing this action will not remove the Coal- and Oil-Fired EGU source category from the CAA section 112(c)(1) list, nor will finalizing this action affect the existing CAA section 112(d) emissions standards promulgated in 2012 that regulate HAP emissions from coal- and oil-fired EGUs, although this action requests comment on that proposed conclusion and whether the EPA has the authority or obligation to

delist the source category and rescind the standards, or to rescind the standards without delisting (Comment C–1).

B. Background

In the 1990 Amendments to the CAA, Congress substantially modified CAA section 112, the provision of the CAA addressing HAP. That provision includes CAA section 112(b)(1), which sets forth a list of 187 identified HAP, and CAA sections 112(b)(2) and (3), which give the EPA the authority to add or remove pollutants from the list. CAA section 112(a)(1) and (2) also specify the two types of sources to be addressed: Major sources and area sources. A major source is any stationary source or group of stationary sources at a single location and under common control that emits or has the potential to emit, considering controls, 10 tons per year (tpy) or more of any HAP or 25 tpy or more of any combination of HAP. CAA section 112(a)(1). Any stationary source of HAP that is not a major source is an area source. CAA section 112(a)(2). All major source categories, besides EGUs, were required to be included on a published list of sources subject to regulation under CAA section 112, *see* CAA sections 112(a)(1) and (c)(1), and area sources ''which the Administrator finds presents a threat of adverse effects to human health or the environment (by such sources individually or in the aggregate) warranting regulation under this section'' were also required to be added to the list, *see* CAA section 112(c)(3). The EPA was to promulgate emission standards under CAA section 112(d) for those source categories on the list.

This general CAA section 112(c) process of listing and regulation does not apply to EGUs. Instead, Congress enacted a special provision, CAA section 112(n)(1)(A), which established a separate process by which the EPA was to determine whether to regulate emissions of HAP from EGUs under CAA section 112. CAA section 112(n)(1)(A) directs the EPA to conduct a study to evaluate the hazards to public health that are reasonably anticipated to occur as a result of the HAP emissions from EGUs, after the imposition of other CAA provisions. The provision directs that the EPA shall regulate EGUs under CAA section 112 if the Administrator determines, after considering the results of the study, that such regulation is ''appropriate and necessary.'' CAA section 112(n)(1)(A), therefore, sets a unique process by which the Administrator is to determine whether to establish CAA section 112(d) standards for EGUs. Moreover, the statute includes a separate definition of ''EGU'' which does not distinguish between major and area sources. CAA section 112(a)(8).

On December 20, 2000, the EPA determined, pursuant to CAA section 112(n)(1)(A), that it was appropriate and necessary to regulate coal- and oil-fired EGUs under CAA section 112(d) and added such units to the CAA section 112(c) List of Categories of Major and Area Sources. 65 FR 79825 (2000 Finding). The EPA reversed that finding in 2005, concluding that it was neither appropriate nor necessary to regulate EGUs under CAA section 112(n)(1)(A), and stating that the effect of its reversal of the appropriate and necessary finding was removal of coal- and oil-fired EGUs from the CAA section 112(c)(1) source category list. 70 FR 15994 (March 29, 2005) (2005 Delisting Rule). The EPA concurrently issued the Clean Air Mercury Rule (CAMR), which regulated mercury (Hg) from new and existing coal-fired EGUs under CAA sections 111(b) and (d). The United States Court of Appeals for the District of Columbia (DC) Circuit (the Court) vacated the EPA's 2005 Delisting Rule in *New Jersey* v. *EPA,* 517 F.3d 574 (D.C. Cir. 2008). The Court ruled that the fact that the EPA had reversed its prior appropriate and necessary finding did not mean that the Agency could remove the Coal- and Oil-Fired EGU source category from the CAA section 112(c)(1) list without going through the generally applicable CAA section 112(c)(9) delisting procedures. *Id.* Instead, the Court held that the Agency could only remove EGUs from the CAA section 112(c)(1) list after finding that the statutory criteria for delisting set forth in CAA section 112(c)(9) had been met. *Id.* In addition, the Court also vacated CAMR in light of the EPA's concession that it had no authority to regulate Hg from EGUs under CAA section 111 so long as EGUs remained on the CAA section 112(c)(1) source category list. 517 F.3d 574 (D.C. Cir. 2008). (The Court did not address the merits of CAMR under CAA section 111; its vacatur was based solely on its holding that the delisting from CAA section 112 was improper.)

On May 3, 2011, the EPA proposed to reaffirm the 2000 appropriate and necessary finding and proposed NESHAP for coal- and oil-fired EGUs, known as MATS. 76 FR 24976. The final MATS rule was subsequently issued on February 16, 2012. 77 FR 9304. Industry, states, environmental organizations, and public health organizations challenged many aspects of both the re-affirmed appropriate and necessary finding and the final MATS rule in the D.C. Circuit. The Court denied all challenges. *White Stallion Energy Center* v. *EPA,* 748 F.3d 1222 (D.C. Cir. 2014). Some industry and state petitioners sought further review of the final MATS rule, and the U.S. Supreme Court granted *certiorari* to determine whether the EPA erred when it concluded that it could properly make the appropriate and necessary finding under CAA section 112(n)(1)(A) without consideration of cost. On June 29, 2015, the Supreme Court ruled that the EPA ''strayed far beyond [the] bounds'' of reasonable interpretation when it determined cost was irrelevant to the appropriate and necessary finding. *Michigan* v. *EPA,* 135 S Ct. 2699, 2707 (2015). Specifically, the Supreme Court held that cost was ''an important aspect of the problem'' and that the Agency was required to consider the cost of regulation before deciding whether it was appropriate and necessary to impose that regulation on EGUs under CAA section 112. *Id.* On remand from the Supreme Court, the D.C. Circuit left MATS in effect while the Agency addressed the *Michigan* decision. Order, *White Stallion Energy Center* v. *EPA,* No. 12–1100 (D.C. Cir. Dec. 15, 2015) (ECF No. 1588459).

On April 25, 2016, after public notice and comment,[1] the EPA finalized a supplemental finding (2016 Supplemental Finding) concluding that its consideration of cost did not change its previous determination that regulation of HAP emissions from coal- and oil-fired EGUs is appropriate and necessary. 82 FR 24420. In the 2016 Supplemental Finding, the EPA considered costs under two alternative approaches. Under the first approach, the EPA evaluated compliance costs in comparison to the industry's historical annual revenues and annual capital expenditures, and examined impacts of the rule on retail electricity prices. The EPA concluded that because these costs were within the range of historical variability, the cost of MATS was reasonable. The EPA also found that the power sector could continue to perform its primary function—the generation, transmission, and distribution of reliable electricity at reasonable cost—after imposition of the MATS rule. Based on the conclusion that the costs of the rule were ''reasonable'' and considering the benefits of reducing HAP that had been identified in earlier agency determinations, the Agency affirmed the appropriate and necessary finding under CAA section 112(n)(1)(A).

In the 2016 Supplemental Finding, the EPA also presented a second, alternative and independent, approach

[1] 80 FR 75025 (December 1, 2015).

to considering cost. This approach considered the results of the formal cost-benefit analysis that the Agency had previously performed for the regulatory impact analysis (RIA) for the final MATS rule.[2] That RIA cost-benefit analysis accounted for the monetized and non-monetized benefits of MATS, including HAP-related benefits that could not be quantified or monetized, as well as the monetized co-benefits of reducing pollutants other than HAP. The RIA analysis found that its projection of these aggregated benefits ($37 to $90 billion each year) exceeded the costs of compliance ($9.6 billion) by three to nine times. The EPA, therefore, concluded that the RIA's cost-benefit analysis also supported its affirmation of the prior appropriate and necessary finding under CAA section 112(n)(1)(A). 82 FR 24420.

A number of state and industry groups petitioned for review of the 2016 Supplemental Finding in the D.C. Circuit. *Murray Energy Corp.* v. *EPA,* No. 16–1127 (D.C. Cir. filed April 25, 2016). In April 2017, given its interest in reviewing the 2016 action, the EPA moved the Court to continue oral argument and hold the case in abeyance in order to give the new Administration an opportunity to undertake that review. The Court granted the EPA's request for a continuance on April 27, 2017. Order, *Murray Energy Corp.* v. *EPA,* No. 16–1127 (D.C. Cir. April 27, 2017) (ECF No. 1672987).

C. The EPA's Proposed Finding Under CAA Section 112(n)(1)(A)

In this action, the EPA proposes to conclude that the 2016 Supplemental Finding was flawed and that, after considering the cost of compliance relative to the HAP benefits of MATS, it is not appropriate and necessary to regulate coal- and oil-fired EGUs under section 112 of the CAA. CAA section 112(n)(1)(A) requires the EPA to determine that both the appropriate *and* the necessary prongs are met. Therefore, if the EPA finds that either prong is not satisfied, it cannot make an affirmative appropriate and necessary finding. *Cf.* 70 FR 16000. The EPA's reexamination of its determination in this proposal focuses on the first prong of that analysis: Whether regulation is ''appropriate,'' after consideration of the costs and benefits of such regulation. The EPA has reexamined the cost analyses presented in the 2016 Supplemental Finding and proposes to determine that neither of the Finding's approaches to considering cost satisfies the Agency's obligation under CAA section 112(n)(1)(A) as interpreted by the Supreme Court in *Michigan.* Instead, we use a different consideration of cost for purposes of the appropriate and necessary finding, one that we believe aligns with the purpose of CAA section 112(n)(1)(A) as set forth in *Michigan*.[3] We propose to directly compare the cost of compliance with MATS with the benefits specifically associated with reducing emissions of HAP as the primary inquiry in this finding, in order to satisfy our duty to consider cost in the context of CAA section 112(n)(1)(A).

The EPA also proposes that, because a negative appropriate and necessary finding cannot by itself remove a source category from the CAA section 112(c) list, *see New Jersey,* 517 F.3d at 582, finalizing this finding will neither remove the Coal- and Oil-Fired EGU source category from the CAA section 112(c) list, nor will it alter or eliminate the CAA section 112(d) emissions standards imposed by MATS. The EPA solicits public comment on all aspects of this proposal, and retains the discretion, as always, to make changes in response to those comments prior to finalizing this rule or to decide not to finalize some or all aspects of this proposal after considering public comments.

1. The 2016 Supplemental Finding Was an Improper Response to *Michigan* v. *EPA*

a. The ''Cost Reasonableness'' Approach Does Not Satisfy the Agency's Obligation Under CAA Section 112(n)(1)(A)

We propose to find that the Agency's 2016 Supplemental Finding erred in its consideration of cost. Specifically, we find that what was described in the 2016 Supplemental Finding as the preferred approach, or ''cost reasonableness test,'' does not meet the statute's requirements to fully consider costs, and was an unreasonable interpretation of CAA section 112(n)(1)(A)'s mandate, as informed by the Supreme Court's opinion in *Michigan.* In its 2016 Supplemental Finding, the EPA developed a ''cost reasonableness test'' based on D.C. Circuit opinions that had evaluated the Agency's consideration of cost in the context of setting new source performance standards under section 111 of the CAA. *See Legal Memorandum Accompanying the Proposed Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs)* (2015 Legal Memorandum). Because those opinions interpreted CAA section 111 to only prohibit the Agency from adopting standards for new sources whose cost would be ''exorbitant,'' *Lignite Energy Council* v. *EPA,* 198 F.3d 930, 933 (D.C. Cir. 1999), ''excessive,'' or ''unreasonable,'' *Sierra Club* v. *Costle,* 657 F.2d 298, 383 (D.C. Cir. 1981), we concluded that we could consider cost for CAA section 112(n)(1)(A) by determining whether cost of compliance was ''reasonable''—in other words, whether the cost of regulation could be absorbed by the power sector without negatively affecting the industry's ability to continue performing its primary function. That ''cost reasonableness test'' compared compliance costs of MATS relative to historical annual revenues and annual capital expenditures, and evaluated the impacts of the rule on retail electricity prices. Because we found that the costs of compliance with the rule across the entire utility sector were within historical variability and would not shut down the sector as a whole, the EPA

[2] U.S. EPA. 2011. *Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards.* EPA–452/R–11–011. Available at *https://www3.epa.gov/ttn/ecas/docs/ria/utilities_ria_final-mats_2011-12.pdf.* Docket ID No. EPA–HQ–OAR–2009–0234–20131.

[3] Agencies have inherent authority to reconsider past decisions and to revise, replace, or repeal a decision to the extent permitted by law and supported by a reasoned explanation. *FCC* v. *Fox Television Stations, Inc.,* 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n* v. *State Farm Mutual Auto. Ins. Co.,* 463 U.S. 29, 42 (1983) (''*State Farm*''). The EPA's interpretations of the statutes it administers are not ''carved in stone,'' but must be evaluated ''on a continuing basis,'' for example, ''in response to . . . a change in administrations.'' *Nat'l Cable & Telecomms. Ass'n* v. *Brand X internet Servs.,* 545 U.S. 967, 981 (2005) (internal quotation marks and citations omitted). An agency's reasoning can include a change in policy on the basis that ''the agency *believes* it to be better,'' even if a court might disagree. *White Stallion,* 748 F.3d at 1235; *see also Nat'l Ass'n of Home Builders* v. *EPA,* 682 F.3d 1032, 1038 & 1043 (D.C. Cir. 2012) (a revised rulemaking based ''on a reevaluation of which policy would be better in light of the facts'' is ''well within an agency's discretion,'' and '' '[a] change in administration brought about by the people casting their votes is a perfectly reasonable basis for an executive agency's reappraisal of the costs and benefits of its programs and regulations' '') (quoting *State Farm,* 463 U.S. at 59 (Rehnquist, J., concurring in part and dissenting in part)). The CAA complements the EPA's inherent authority to reconsider prior rulemakings by providing the Agency with broad authority to prescribe regulations as necessary to carry out the Administrator's authorized functions under the statute. 42 U.S.C. 7601(a). This broad discretion can be limited by Congress, however. In *New Jersey* v. *EPA,* the D.C. Circuit held that a reversal of the appropriate and necessary finding would not have the effect of removing Coal- and Oil-Fired EGUs from the CAA section 112(c)(1) source category list because Congress ''unambiguously limit[ed] EPA's discretion'' by fashioning a statutorily mandated avenue for removing source categories from the list in CAA section 112(c)(9). 517 F.3d 574, 582–83. (D.C. Cir. 2008).

concluded that the cost of compliance with MATS was reasonable.

The Agency claimed that use of the ''cost reasonableness test'' for its CAA section 112(n)(1)(A) appropriate and necessary finding was supported by the ''overall statutory objectives of section 112,'' and stated that ''cost was but one factor among many'' that the EPA must consider. *See* Legal Memorandum at 20. We also interpreted CAA section 112(n)(1)(A) and *Michigan* not to require the EPA to assume that a consideration of cost should predominate or take primary significance to the subordination of other considerations, because of CAA section 112's overall concern with the nature of HAP emissions and populations that might be particularly sensitive to harms associated with those emissions. *Id.*

In this notice, we are proposing to find that the EPA did not comply with its statutory duty to consider cost as part of the appropriate and necessary finding in the 2016 Supplemental Finding. The 2016 Supplemental Finding repeatedly emphasized that the *Michigan* Court did not hold that the CAA ''unambiguously required'' the EPA to perform a formal cost-benefit analysis to satisfy CAA 112(n)(1)(A). 135 S. Ct. at 2711. But, as discussed below, the 2016 Supplemental Finding, among other flaws, ignored observations about the importance of the cost consideration to the appropriate and necessary finding, as provided by the Court in *Michigan.*

Contrary to the 2015 Legal Memorandum's suggestion that cost should not ''trump'' or ''predominate'' other considerations, the Supreme Court observed that ''[a]gencies have long treated cost as a *centrally relevant factor* when deciding whether to regulate.'' *Id.* at 2707 (emphasis added). The Supreme Court rejected arguments that the general goals of CAA section 112 make cost irrelevant to a CAA section 112(n)(1)(A) appropriate and necessary finding. As such, the EPA must meaningfully consider cost when making this threshold finding. In addition, the Supreme Court emphasized that CAA section 112(n)(1)(A) reflects Congress's intent that the EPA treat EGUs *differently* from other sources. *Id.* at 2710. The attempt made in the 2016 Supplemental Finding to ''harmonize'' CAA section 112(n)(1)(A) with the remainder of CAA section 112 is, therefore, not consistent with Congress's intent and the Supreme Court's decision in *Michigan* v. *EPA.*

The 2016 Supplemental Finding's reliance on case law pertaining to CAA section 111(b) new source rules was similarly misguided. The methodologies that courts have approved for considering costs of control technologies for new sources that have not yet been constructed are not particularly informative in the context of EPA's deciding whether it is appropriate to impose control requirements on sources that are already operating. Costs of control technologies for new sources are borne as each source is added to the fleet of existing sources and are not imposed on the entire fleet of existing sources within a period of a few years, as is required under CAA section 112. Moreover, the case law cited by the 2015 Legal Memorandum is distinguishable even without regard to the fact that different statutory provisions (CAA section 111 versus 112) are at issue. For example, in *Lignite Council,* the D.C. Circuit found that the ''new standards will only modestly increase the cost of producing electricity in newly constructed boilers.'' *Lignite Energy Council* v. *United States EPA,* 198 F.3d at 933. Even in its flawed conclusion that the cost of MATS was ''reasonable,'' the EPA did not go so far as to say that the costs of that rule were in any way ''modest.''

The primary, fatal flaw of the 2016 Supplemental Finding's ''preferred approach'' was its disregard for the *Michigan* Court's suggestion that, under CAA section 112(n)(1)(A), the Agency must meaningfully consider cost within the context of a regulation's benefits. The decision contemplated that a proper consideration of cost would be relative to benefits. For example, the Court questioned whether a regulation could be considered ''rational'' where there was a gross imbalance between costs and benefits and stated that ''[n]o regulation is ''appropriate'' if it does more harm than good.'' *Id.* The Court also made numerous references to a direct comparison of the costs of MATS with benefits from reducing emissions of HAP. For instance, the Court pointed out that ''[t]he costs [of MATS] to power plants were thus between 1,600 and 2,400 times as great as the quantifiable benefits from reduced emissions of hazardous air pollutants.'' *Id.* at 2706. Although the decision established no bright-line rules, it suggested that CAA section 112(n)(1)(A)'s requisite consideration of cost would not be met if the cost analysis did not ''ensure cost-effectiveness'' or ''prevent the imposition of costs far in excess of benefits.'' *Id.* at 2710.

For these reasons, the 2016 Supplemental Finding's ''test'' of whether an industry can bear the cost of regulation does not demonstrate that the cost of MATS was ''reasonable'' under the particular statutory context. More importantly, the metrics ''tested'' by the Agency in the 2016 Supplemental Finding are irrelevant to the determination of whether it is ''appropriate and necessary'' to impose that regulation. Each cost metric the Agency examined compared the cost of MATS to other costs borne by the industry, but never in its ''preferred approach'' did the Agency make the statutorily mandated assessment of whether the benefits garnered by the rule were worth it—*i.e.,* a direct comparison of costs and benefits. Because the ''cost reasonableness test'' failed to consider cost in a meaningful way relative to benefits, we, therefore, conclude that approach did not adequately address the Supreme Court's instruction that a reasonable regulation requires an agency to fully consider ''the advantages *and* the disadvantages'' of a decision. *See Michigan,* 135 S. Ct. at 2707 (emphasis in original). Instead, we propose to reconsider cost using a more direct comparison of benefits and costs to address the Supreme Court's remand of the appropriate and necessary determination, as described below. As noted below, final action on this proposal would replace the 2016 Supplemental Finding.

b. The Cost-Benefit Approach in the 2016 Supplemental Finding's Alternative Approach Improperly Considered Co-benefits From Non-HAP Emissions Reductions

In the 2016 Supplemental Finding's alternative approach, the EPA improperly made an independent finding under CAA section 112(n)(1)(A) that was based on a formal benefit-cost analysis, which evaluates whether a regulation will increase economic efficiency, to find that it was appropriate and necessary to regulate EGUs under CAA section 112. *See* 81 FR 24425.[4] The formal benefit-cost analysis relied on information reported in the RIA performed for the MATS rule. The quantified benefits accounted for in the formal benefit-cost analysis in the 2016 Supplemental Finding's alternative approach included both HAP and non-HAP air quality benefits. In this action, we propose to find that the EPA's equal reliance on the particulate matter (PM) air quality co-benefits projected to occur as a result of the reductions in HAP was flawed as the focus of CAA section

[4] We use the term ''formal benefit-cost analysis'' to refer to an economic analysis that attempts to quantify all significant consequences of an action in monetary terms in order to determine whether an action increases economic efficiency. Assuming that all consequences can be monetized, actions with positive net benefits (*i.e.,* benefits exceed costs) improve economic efficiency.

112(n)(1)(A) is HAP emissions reductions.

The EPA developed an RIA for the 2012 final MATS rule pursuant to Executive Orders 12866 and 13563 and other applicable statutes (*e.g.,* the Regulatory Flexibility Act and the Unfunded Mandates Reform Act), as informed by OMB guidance [5] and the EPA's Economic Guidelines.[6] The analyses the EPA conducted generated an estimate of the quantifiable benefits of HAP reductions under the rule of $4 to $6 million annually.[7] The EPA also analyzed the PM air quality co-benefits of MATS and attributed these benefits to the rule. The RIA included in its analysis a consideration of the co-benefit reductions in the emissions of pollutants other than the HAP regulated by MATS, such as nitrogen oxides (NO_X) and sulfur dioxide (SO_2), which contribute to the formation of fine particulate matter ($PM_{2.5}$). Reductions of these NO_X and SO_2 emissions result from installing control technologies and implementing the compliance strategies necessary to reduce the HAP emissions directly regulated by MATS. The EPA projected that the co-benefits associated with reducing these non-HAP pollutants would be substantial. Indeed, these projected co-benefits comprised the overwhelming majority (approximately 99.9 percent) of the monetized benefits of MATS reflected in the EPA's RIA ($36 billion to $89 billion). By comparison, compliance costs of the final MATS rule were projected to be $9.6 billion in 2015, and $8.6 billion and $7.4 billion in 2020 and 2030, respectively.[8] These compliance costs are an estimate of the increased expenditures in capital, fuel, and other inputs by the entire power sector to comply with the EPA's requirements, while continuing to provide a given level of electricity demand. In the 2016 Supplemental Finding's alternative approach, to satisfy the required consideration of cost when determining whether it is appropriate and necessary to regulate under CAA section 112(n)(1)(A), the EPA compared these monetized costs to the monetized benefits, along with unquantified and unmonetized effects, to conclude that MATS would increase economic efficiency and, therefore, reaffirmed its earlier finding that it was appropriate and necessary to regulate EGUs.

The EPA's justification for its equal reliance on the co-benefits of non-HAP emissions when setting the MATS standards in its CAA section 112(n)(1)(A) determination was flawed. The Agency erred in concluding that the statutory text of CAA section 112(n)(1)(A) and the legislative history of CAA section 112 more generally ''expressly support[ed]'' the position that it was reasonable to consider co-benefits, and give equal weight to those co-benefits, in a CAA section 112(n)(1)(A) appropriate and necessary finding. 81 FR 24439. The 2016 Supplemental Finding pointed to CAA section 112(n)(1)(A)'s directive to ''perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units of [HAP] after imposition of the requirements of [the CAA],'' and noted that the requirement to consider co-benefit reduction of HAP resulting from other CAA programs highlighted Congress' understanding that programs targeted at reducing non-HAP pollutants can and do result in the reduction of HAP emissions. *Id.* The finding also noted that the Senate Report on CAA section 112(d)(2) recognized that maximum achievable control technology (MACT) standards would have the collateral benefit of controlling criteria pollutants. *Id.* However, these statements acknowledging that reductions in HAP can have the collateral benefit of reducing non-HAP emissions and vice versa, provides no support for the proposition that any such co-benefits should be the Agency's primary consideration when making a finding under CAA section 112(n)(1)(A). Indeed, it would be highly illogical for the Agency to make a determination that regulation under CAA section 112, which is expressly designed to deal with HAP, is justified principally on the basis of the criteria pollutant impacts of these regulations. That is, if the HAP-related benefits are not at least moderately commensurate with the cost of HAP controls, then no amount of co-benefits can offset this imbalance for purposes of a determination that it is appropriate to regulate under CAA section 112(n)(1)(A). *Cf. Michigan,* 135 S. Ct. at 2707 (''One would not say that it is even rational, never mind ''appropriate,'' to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits.'').

The 2016 Supplemental Finding's benefit-cost approach also erred in implying that the results of an economic efficiency test, as informed by the benefit-cost analysis presented in the MATS RIA, should govern the cost consideration assessment in CAA section 112(n)(1)(A). A formal benefit-cost analysis does not dictate how cost should be considered under CAA section 112(n)(1)(A), particularly where, as noted above, the statutory provision indicates Congress' particular concern about risks associated with HAP and the benefits that would accrue from reducing those risks. Although an analysis of all benefits and costs in accordance with generally recognized benefit-cost analysis practices is appropriate for informing the public about the potential effects of any regulatory action, as well as for complying with the requirements of Executive Order 12866, this does not mean that equal consideration of all benefits and costs, including co-benefits, is appropriate for the specific statutory appropriate and necessary finding called for under CAA section 112(n)(1)(A). Rather this finding is necessarily governed by the particular statutory language and context of this provision, as discussed below.

In sum, the Agency did not provide any meaningful support for its conclusion that the statutory text and legislative history support placing consideration of co-benefits in a CAA section 112(n)(1)(A) determination on equal footing with the consideration of HAP-specific benefits and, as explained below, the statutory text strongly supports the use of a different approach.

2. It Is Not Appropriate and Necessary To Regulate EGUs Under CAA Section 112

In this action, the EPA proposes to conclude that it is not appropriate and necessary to regulate HAP from EGUs under CAA section 112 because the costs of such regulation grossly outweigh the HAP benefits. The EPA is taking comment on its proposal that direct comparison of the rule's costs and benefits is a reasonable approach, if not the only permissible approach, to considering costs in response to *Michigan,* and, further, that such a comparison performed under CAA section 112(n)(1)(A) should focus primarily on benefits associated with reduction of HAP (Comment C–2). A proper consideration of costs based on this approach demonstrates that the

[5] U.S. OMB. 2003. *Circular A–4 Guidance to Federal Agencies on Preparation of Regulatory Analysis.* Available at *https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.*

[6] U.S. EPA. 2014. *Guidelines for Preparing Economic Analyses.* EPA–240–R–10–001. National Center for Environmental Economics, Office of Policy. Washington, DC. December. Available at *https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses.* Docket ID No. EPA–HQ–OAR–2009–0234–20503.

[7] Like the MATS RIA, all benefits and costs in this and subsequent sections are reported in 2007 dollars.

[8] *See* Table 3–5 of the RIA: *https://www3.epa.gov/ttn/ecas/docs/ria/utilities_ria_final-mats_2011-12.pdf.*

total cost of compliance with MATS ($7.4 to $9.6 billion annually) dwarfs the monetized HAP benefits of the rule ($4 to $6 million annually). As discussed further below, while there are unquantified HAP benefits and significant monetized PM co-benefits associated with MATS, the Administrator has concluded that the identification of these benefits is not sufficient, in light of the gross imbalance of monetized costs and HAP benefits, to support a finding that it is appropriate and necessary to regulate EGUs under CAA section 112.

The statutory text of CAA section 112(n)(1)(A) and the *Michigan* decision both support focusing the ''appropriate and necessary'' determination on HAP-specific benefits and costs. The study referenced in CAA section 112(n)(1)(A) specifically focuses on the hazards to public health that will reasonably occur as a result of HAP emissions, not harmful emissions in general. According to this section, ''The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is appropriate and necessary after considering the results of the study required by this subparagraph.'' The text, on its face, thus, suggests that Congress wanted the Administrator's appropriate and necessary determination to be focused on the health hazards related to HAP emissions and the potential benefits of avoiding those hazards by reducing HAP emissions. As noted in section II.C.1.b. of this preamble, while the provision acknowledges the existence of the phenomenon of co-benefits by referencing the potential for ancillary reductions of HAP emissions by way of CAA provisions targeted at other pollutants, acknowledgement of that fact does not address whether ancillary reductions of criteria pollutants should be part of the Administrator's determination under CAA section 112(n)(1)(A), which is undeniably focused on hazards resulting from HAP-specific emissions. Indeed, the direction to consider whether it is appropriate and necessary to regulate HAP after criteria pollutants have been addressed by the CAA's other requirements is, if anything, support for the conclusion that it is *not* proper to place much weight on the co-benefits of further criteria pollutant reductions as part of the CAA section 112(n)(1)(A) determination. Directing the EPA to study HAP effects under CAA section 112 *after* other provisions of the CAA had been implemented suggests that Congress envisioned that the judgement about whether additional regulation was appropriate and necessary should be predicated primarily on an assessment of HAP emissions from this source category. Similarly, the general recognition of the existence of collateral benefits or controlling criteria pollutants in CAA section 112's legislative history [9] does not shed any light on whether such benefits should be given equal consideration in a CAA section 112(n)(1)(A) determination. This is particularly so where that legislative history is unconnected to CAA section 112(n)(1)(A), a special provision written by Congress to address the unique circumstances facing EGUs. In fact, it would not be reasonable to rely on such legislative history in light of the Supreme Court's conclusion that the Agency erred attempting to ''harmonize'' CAA section 112(n)(1)(A) with the remainder of CAA section 112. As the Court noted, ''[t]his line of reasoning overlooks the whole point of having a separate provision about power plants: Treating power plants different from other stationary sources.'' *Michigan,* 135 S. Ct. at 2710.

Finally, we note that this action proposes to primarily consider the costs of MATS in comparison with the HAP benefits of the hazardous pollution reductions from MATS. In keeping with CAA section 112(n)(1)(A) and the overall structure of the CAA, we think it is appropriate not to give equal weight to non-HAP co-benefits in this comparison. Congress established a rigorous system for setting standards of acceptable levels of criteria air pollutants and wrote a comprehensive framework directing the implementation of those standards in order to address the health and environmental impacts associated with those pollutants. *See, e.g.,* 42 U.S.C. 7409; 7410; 7501; 7502; 7505a; 7506; 7506a; 7507; 7509; 7509a; 7511; 7511a; 7511b; 7511c; 7511d; 7511e; 7511f; 7512; 7512a; 7513; 7513a; 7513b; 7514; and 7515. As noted above, the vast majority of estimated monetized benefits resulting from MATS are associated with reductions in $PM_{2.5}$ precursor emissions, principally NO_X and SO_2. Both NO_X and SO_2 are criteria pollutants and precursors to criteria pollutants that are already addressed by the cavalcade of statutory provisions governing levels of these pollutants, including the National Ambient Air Quality Standards (NAAQS) provisions that require the EPA to set standards for criteria pollutants requisite to protect public health with an adequate margin of safety, and by state, regional, and national rulemakings establishing control measures to meet those levels. To the extent that additional reductions of these criteria pollutants are necessary to protect public health, regulation explicitly targeted at these pollutants is best reserved for the NAAQS program, under which Congress provided the EPA ample authority to regulate.

The total cost of compliance with MATS ($7.4 to $9.6 billion annually) [10] vastly outweighs the monetized HAP benefits of the rule ($4 to $6 million annually).[11] Even with the substantial monetized PM co-benefits and the significant unquantified HAP benefits associated with MATS, the gross disparity between monetized costs and HAP benefits, which we believe to be the primary focus of the Administrator's determination in CAA section 112(n)(1)(A), is too large to support an affirmative appropriate and necessary finding. As explained in the MATS RIA, the only health benefit attributed to reducing Hg emissions that the EPA could quantify and monetize was IQ loss in children born to a subset of recreational fishers who consume fish during pregnancy.[12] The EPA also identified benefits associated with regulation of HAP from EGUs that could not be quantified. These effects include impacts of Hg on human health (including neurologic, cardiovascular, genotoxic, and immunotoxic effects), a variety of adverse health effects associated with exposure to certain non-Hg HAP (including cancer, and chronic and acute health disorders that implicate multiple organ systems such as the lungs and kidneys), and effects on wildlife and ecosystems.[13] [14]

The EPA acknowledges the importance of these benefits and the limitations on the Agency's ability to monetize HAP-specific benefits. The

[9] *See* Legal Memorandum at 25 n.28 (citing *A Legislative History of the Clean Air Act Amendments of 1990,* Vol. 5, at 8512 (CAA Amendments of 1989, at 172, *Report of the Committee on Environment and Public Works,* S.1630)).

[10] *See* Table 3–5 on page 3–14 and Table 3–16 on page 3–31 of the MATS RIA.

[11] *See* Table ES–4 on page ES–6 of the MATS RIA.

[12] U.S. EPA, 2011. *Revised Technical Support Document: National-Scale Assessment of Mercury Risk to Populations with High Consumption of Self-Caught Freshwater Fish In Support of the Appropriate and Necessary Finding for Coal- and Oil-Fired Electric Generating Units.* Office of Air Quality Planning and Standards. November. EPA–452/R–11–009. Docket ID No. EPA–HQ–OAR–2009–0234–19913.

[13] *See* Chapters 4 and 5 of the MATS RIA.

[14] In addition, the MATS RIA attributed unquantified health benefits to reductions in emissions of nitrogen dioxide (NO_2) and SO_2. However, as discussed above, these unquantified criteria pollutant co-benefits are no longer relevant given the different approach to considering such co-benefits that the EPA is now proposing to take. *See* Chapter 5 of the MATS RIA.

EPA agrees that such benefits are relevant to any comparison of the benefits and costs of a regulation. Because unquantified benefits are, by definition, not considered in monetary terms, the Administrator must evaluate the evidence of unquantified benefits and determine the extent to which they alter any conclusions based on the comparison of monetized costs and benefits. The MATS RIA accounts for all the monetized *and* unquantified benefits of the rule, and the EPA's proposed approach to the cost-benefit analysis in the RIA does not discount the existence or importance of the unquantified benefits of reducing HAP emissions.[15] Instead, after fully acknowledging the existence and importance of such benefits, the EPA proposes to conclude that substantial and important unquantified benefits of MATS are not sufficient to overcome the significant difference between the monetized benefits and costs of this rule. As noted, the unquantified HAP-related benefits of MATS involve only a limited set of mercury and other HAP-related morbidity effects in humans and ecosystems. The EPA has provided an updated comparison of costs and target pollutant benefits in a memorandum to the rulemaking docket.[16] Table 1 of the memorandum estimates that the net target HAP benefits of the rule (HAP benefits—costs) are negative. As noted elsewhere in the notice, the actual costs and benefits of the MATS rule may differ from the EPA's analysis. However, as explained in the memorandum, given that the CAA section 112(n)(1)(A) finding is a threshold analysis that Congress intended the Agency would complete prior to regulation, the EPA believes it is reasonable for purposes of this reconsideration to rely on the estimates projected prior to the rule's taking effect, *i.e.,* the estimates of costs and benefits calculated in the 2011 RIA. In addition, even assuming that actual costs and benefits differed from projections made in 2011, given the large difference between target HAP benefits and estimated costs, the outcome of the Agency's proposed finding here would likely stay the same.

For all of these reasons, and paying particular heed to the statutory text and purpose of CAA section 112(n)(1)(A) as well as the Supreme Court's direction in *Michigan,* we propose to find that it is not appropriate and necessary to regulate coal- and oil-fired EGUs under section 112 of the CAA.

D. Effects of This Proposed Replacement of the Supplemental Finding

1. Effects of This Proposed Replacement

Final action on this proposed replacement of the 2016 Supplemental Finding will reverse the Agency's conclusion under CAA section 112(n)(1)(A), first made in 2000 and later affirmed in 2012 and 2016, that it is appropriate and necessary to regulate HAP from EGUs. We propose to conclude that finalizing this replacement will not remove the Coal- and Oil-Fired EGU source category from the CAA section 112(c)(1) list, nor will finalizing this revision otherwise affect the existing CAA section 112(d) emissions standards promulgated in 2012. Under D.C. Circuit case law, the EPA's determination that a source category was listed in error does not by itself remove a source category from the CAA section 112(c)(1) list—even EGUs, notwithstanding their special treatment under CAA section 112(n). *New Jersey* v. *EPA,* 517 F.3d 574 (D.C. Cir. 2008). Instead, in order to remove a source category from the CAA section 112(c)(1) list, the EPA must determine that the CAA section 112(c)(9) statutory criteria for delisting have been met. *Id.* The EPA requests comment on its interpretation of *New Jersey* in the context of this proposed finding (Comment C–3).

In 2005, the EPA reversed the December 2000 Finding and concluded that it was neither appropriate nor necessary to regulate coal- and oil-fired EGUs under CAA section 112 and delisted such units from the CAA section 112(c) source category list. 70 FR 15994. In that rule we stated, ''EPA reasonably interprets section 112(n)(1)(A) as providing it authority to remove coal- and oil-fired units from the section 112(c) list at any time that it makes a negative appropriate and necessary finding under the section.'' 70 FR 16032 (2005 Delisting Rule). In the 2005 Delisting Rule, the EPA ''identified errors in the prior [2000] finding and determined that the finding lacked foundation.'' *Id.* at 16033. Because we found that the 2000 Finding had been in error at the time of listing, we concluded that coal- and oil-fired EGUs ''should never have been listed under section 112(c) and therefore the criteria of section 112(c)(9) do not apply'' in removing the source category from the list. *Id.* In addition, we pointed out that the inclusion of EGUs on the 112(c)(1) list was not a ''final agency action.'' *Id.* Therefore, we stated that we had ''inherent authority under the CAA to revise [the listing] at any time based on either identified errors in the December 2000 finding or on new information that bears upon that finding.'' *Id.*

The D.C. Circuit rejected the EPA's interpretations and vacated the 2005 Delisting Rule, holding that the CAA unambiguously requires the delisting criteria in CAA section 112(c)(9) to have been met before ''any'' source category can be removed from the CAA section 112(c)(1) list. *New Jersey,* 517 F.3d at 582. It specified that, under the CAA's plain text and under step one of *Chevron,* ''the *only* way the EPA could remove EGUs from the section 112(c)(1) list'' was to satisfy those criteria. *Id.* (emphasis added). The Court expressly rejected the EPA's argument that, ''[l]ogically, if EPA makes a determination under section 112(n)(1)(A) that power plants should not be regulated at all under section 112 . . . [then] this determination *ipso facto* must result in removal of power plants from the section 112(c) list.'' *Id.* (quoting the EPA's brief). Instead, the Court maintained that CAA section 112(n)(1) governed only how the Administrator determines whether to list EGUs, and that any and all attempts to remove categories from the list were under the exclusive purview of CAA section 112(c)(9). *See id.* The Court further held that the existence of CAA section 112(c)(9) limited the normal discretion an Agency would typically have to reverse its position and undo the administrative determination to list EGUs as a source category. *See Id.* at 582–83.

In this action, we propose to reverse the conclusions presented in the 2016 Supplemental Finding and to find that, after consideration of the cost of compliance with the CAA section 112(d) standards, it is not appropriate and necessary to regulate HAP emissions from EGUs under CAA section 112. Consistent with *New Jersey,* the EPA is proposing to find that this reversal of the CAA section 112(n)(1)(A) determination, if finalized, would not have the effect of removing EGUs from the CAA section 112(c)(1) source category list. Because EGUs would remain on the CAA section 112(c)(1)

[15] *Id.* The Agency is not in this proposed replacement to the 2016 Supplemental Finding reopening the prior findings and risk assessments made over the last two decades. The EPA also explained in the MATS RIA that there are significant obstacles to successfully quantifying and monetizing the public health benefits from reducing HAP emissions. These obstacles include gaps in toxicological data, uncertainties in extrapolating results from high-dose animal experiments to estimate human effects at lower doses, limited monitoring data, difficulties in tracking diseases such as cancer that have long latency periods, and insufficient economic research to support the valuation of the health impacts often associated with exposure to individual HAP.

[16] *Compliance Cost, HAP Benefits, and Ancillary Co-Pollutant Benefits for ''National Emission Standards for Hazardous Air Pollutants: Coal-and Oil-Fired Electric Utility Steam Generating Units—Reconsideration of Supplemental Finding and Residual Risk and Technology Review.''*

source category list, the CAA section 112(d) standards for that category, as promulgated in the MATS rule, would be unaffected by final action on this proposal.

2. Alternative Interpretations of Effects of This Proposed Replacement: Requests for Comment

The EPA also solicits comment on two alternative interpretations of the impact of reversing the 2016 Supplemental Finding. Specifically, the Agency solicits comment under two separate theories on whether, contrary to the interpretation discussed above, the EPA would have authority to rescind the MATS rule and delist EGUs from CAA section 112 if, acting on remand following the Supreme Court's opinion in *Michigan,* it were to finalize its proposed conclusion that it is not appropriate and necessary to regulate HAP from coal- and oil-fired EGUs (Comment C–4). The Agency also solicits comment on whether, in light of the fact that the CAA section 112(n)(1)(A) finding is a threshold determination to setting the CAA section 112(d) standards, we would be obligated to rescind the rule if we were to finalize our proposed finding that it is not appropriate and necessary to regulate HAP from these sources, even if such a finding did not remove EGUs from the list of covered sources under CAA section 112(c) (Comment C–5).

In particular, we solicit comment on whether the EPA could reasonably conclude that the D.C. Circuit's holding in *New Jersey* v. *EPA* does not limit the Agency's authority to rescind the MATS rule, under two alternative interpretations (Comment C–6). Under the first alternative interpretation, we seek comment on whether *New Jersey* is distinguishable because the facts here are sufficiently different from those considered by the Court reviewing the 2005 Delisting Rule at issue (Comment C–7). In that case, the original 2000 Finding and CAA section 112(c)(1) listing were in place, but because the EPA had not yet promulgated CAA section 112(d) standards, the finding itself was not yet reviewable. CAA section 112(e)(4); *see also UARG* v. *EPA,* No. 01–1074, 2001 U.S. App. LEXIS 18436, 2001 WL 936363 (D.C. Cir. July 26, 2001). Here, the 2012 Finding was challenged and reviewed by the Supreme Court in *Michigan* v. *EPA,* which found that the EPA's determination that it was appropriate and necessary to regulate HAP from EGUs was flawed. Because the Supreme Court found that determination to be flawed, the EPA necessarily retains the discretion to reach a different conclusion from that reached in 2012 when we promulgated MATS. This proposed reversal of the 2016 Supplemental Finding is a continuation of the Agency's response to the Supreme Court's remand, and *New Jersey* does not limit the effect of an action made in response to a Supreme Court decision finding the original action flawed, nor does it limit the Agency's ability to revise its response to a Supreme Court decision. Therefore, the EPA would have authority to rescind MATS and remove EGUs from the list of source categories regulation under CAA section 112 after finalizing this reversal of the 2016 Supplemental Finding.

Under the second alternative interpretation, the EPA seeks comment on whether, were the proposed reversal to be finalized, EGUs would remain on the CAA section 112(c) list of sources, but the EPA would have the authority to rescind the standards regulating those source's emissions under CAA section 112(d) in light of the fact that CAA section 112(n)(1)(A) plainly establishes that the Administrator must find regulation under CAA section 112 is appropriate and necessary as a prerequisite to undertaking such regulation (Comment C–8). *New Jersey* v. *EPA* held that the EPA may not remove a source category from the CAA section 112(c) list without demonstrating that the delisting analysis under CAA section 112(c)(9) has been satisfied, but the decision did not address the question whether, in the absence of a valid appropriate and necessary finding, the EPA must regulate EGUs for HAP.

Finally, although the alternative interpretations described immediately above both suggest the EPA would have the discretionary authority to rescind MATS (either with or without delisting), the EPA solicits comment on whether, under either alternative interpretation, the Agency would instead be *obligated* to rescind MATS once it finalized a reversal of the 2016 Supplemental Finding (Comment C–9).

We solicit comment on all aspects of these alternative interpretations of the impacts of replacing the 2016 Supplemental Finding and these potential alternate readings of the Court's decision in *New Jersey* (Comment C–10).

III. Criteria for Delisting a Source Category Under CAA Section 112(c)(9)

As noted above, *New Jersey* held that the EPA cannot remove a source category from the CAA section 112(c) source category list without addressing the delisting criteria in CAA section 112(c)(9). CAA section 112(c)(9)(B) provides that ''[t]he Administrator may delete any source category'' from the CAA section 112(c) source category list if the Agency determines that: (1) For HAP that may cause cancer in humans, ''no source in the category (or group of sources in the case of area sources) emits such hazardous air pollutants in quantities which may cause a lifetime risk of cancer greater than one in one million to the individual in the population who is most exposed to emissions of such pollutants from the source (or group of sources in the case of area sources)''; and (2) for HAP that may result in human health effects other than cancer or adverse environmental effects, ''a determination that emissions from no source in the category or subcategory concerned (or group of sources in the case of area sources) exceed a level which is adequate to protect public health with an ample margin of safety and no adverse environmental effect will result from emissions from any source.''

In this action, the EPA is neither conducting a delisting analysis under CAA section 112(c)(9) for the Coal- and Oil-Fired EGU source category, nor soliciting comment on whether such an analysis should be conducted, or on what any such analysis would demonstrate. Any such comments would be outside the scope of this action.

The Agency notes that the proposed results of its risk review indicate that with the MATS rule in place, the estimated inhalation cancer risk to the individual most exposed to actual emissions from the source category is 9-in-1 million. As noted above, the EPA is not proposing a delisting analysis and any such analysis would likely differ from the analysis done for the CAA section 112(f)(2) risk review in important aspects.

In addition, on two previous occasions, the EPA has examined the statutory delisting criteria with respect to EGUs and found that the criteria were not met. We summarize without adding to those findings below.

In 2011, in response to the EPA's request for comments on the proposed MATS rule, the Utility Air Regulatory Group (UARG) submitted a petition pursuant to CAA section 112(c)(9) requesting that coal-fired EGUs be removed from the CAA section 112(c) List of Categories of Major and Area Sources.[17] In its petition, UARG

[17] *Petition of the Utility Air Regulatory Group for the De-Listing of Coal-Fired Electric Utility Steam Generating Units as a Source Category Subject to Section 112 of the Clean Air Act.* Docket ID No. EPA–HQ–OAR–2009–0234–17777.

asserted that: (1) No coal-fired EGU or group of coal-fired EGUs emit HAP in amounts that will cause a lifetime cancer risk greater than 1-in-1 million; and (2) no coal-fired EGU or group of coal-fired EGUs emit non-carcinogenic HAP in amounts that will exceed a level which is adequate to protect public health with an ample margin of safety or cause adverse environmental effects. The EPA denied this petition on several grounds.[18] First, the EPA rejected UARG's request on the basis that, under D.C. Circuit precedent, the Agency is not permitted to delist a portion of a source category that poses cancer risks.[19] Second, the EPA found that UARG's data and analyses identified a maximum individual cancer risk of 4-in-1 million, which exceeds the statutory threshold in CAA section 112(c)(9)(B)(i) of 1-in-1 million. Additionally, the EPA found that UARG's analysis did not fully characterize noncancer human health effects for the source category and further, that UARG failed to show that ''no adverse environmental effects will result from emissions from any source'' pursuant to CAA section 112(c)(9)(B)(ii). For all these reasons, the EPA denied UARG's petition to delist coal-fired EGUs from the CAA section 112(c) source category list. UARG challenged the EPA's denial of its delisting petition as arbitrary and capricious, and the D.C. Circuit dismissed UARG's challenge on the basis that the EPA had adequately demonstrated that the CAA section 112(c)(9) delisting criteria were not met by UARG's analysis. *White Stallion,* 748 F.3d at 1248.

The EPA also independently conducted an analysis which also confirmed that the Coal- and Oil-Fired EGU source category cannot be delisted pursuant to CAA section 112(c)(9).[20] The EPA analyzed non-Hg inhalation risks from 16 EGU facility case studies, including both coal- and oil-fired EGUs. Of the 16 facilities analyzed, six had cancer risks greater than 1-in-1 million, exceeding the delisting criteria in CAA section 112(c)(9)(B)(i). Because EGUs failed to meet the first delisting requirement, the Agency did not need to determine whether the second delisting requirement was satisfied.

IV. Background on the RTR Action

A. What is the statutory authority for this action?

The statutory authority for this action is provided by sections 112 and 301 of the CAA, as amended (42 U.S.C. 7401 *et seq.*). Section 112 of the CAA establishes a two-stage regulatory process to develop standards for emissions of HAP from stationary sources. Generally, the first stage involves establishing technology-based standards and the second stage involves evaluating those standards that are based on MACT to determine whether additional standards are needed to address any remaining risk associated with HAP emissions. This second stage is commonly referred to as the ''residual risk review.'' In addition to the residual risk review, the CAA also requires the EPA to review standards set under CAA section 112 every 8 years to determine if there are ''developments in practices, processes, or control technologies'' that may be appropriate to incorporate into the standards. This review is commonly referred to as the ''technology review.'' When the two reviews are combined into a single rulemaking, it is commonly referred to as the ''risk and technology review.'' The discussion that follows identifies the most relevant statutory sections and briefly explains the contours of the methodology used to implement these statutory requirements. A more comprehensive discussion appears in the document titled *CAA Section 112 Risk and Technology Reviews: Statutory Authority and Methodology* in the docket for this rulemaking.

In the first stage of the CAA section 112 standard setting process, the EPA promulgates technology-based standards under CAA section 112(d) for categories of sources identified as emitting one or more of the HAP listed in CAA section 112(b). Sources of HAP emissions are either major sources or area sources, and CAA section 112 establishes different requirements for major source standards and area source standards. ''Major sources'' are those that emit or have the potential to emit 10 tpy or more of a single HAP or 25 tpy or more of any combination of HAP. All other sources are ''area sources.'' For major sources, CAA section 112(d)(2) provides that the technology-based NESHAP must reflect the maximum degree of emission reductions of HAP achievable (after considering cost, energy requirements, and non-air quality health and environmental impacts). These standards are commonly referred to as MACT standards. CAA section 112(d)(3) also establishes a minimum control level for MACT standards, known as the MACT ''floor.'' The EPA must also consider control options that are more stringent than the floor. Standards more stringent than the floor are commonly referred to as beyond-the-floor standards. In certain instances, as provided in CAA section 112(h), the EPA may set work practice standards where it is not feasible to prescribe or enforce a numerical emission standard. For area sources, CAA section 112(d)(5) gives the EPA discretion to set standards based on generally available control technologies or management practices (GACT standards) in lieu of MACT standards.

The second stage in standard-setting focuses on identifying and addressing any remaining (*i.e.,* ''residual'') risk according to CAA section 112(f). For source categories subject to MACT standards, section 112(f)(2) of the CAA requires the EPA to determine whether promulgation of additional standards is needed to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect. Section 112(d)(5) of the CAA provides that this residual risk review is not required for categories of area sources subject to GACT standards. Section 112(f)(2)(B) of the CAA further expressly preserves the EPA's use of the two-step approach for developing standards to address any residual risk and the Agency's interpretation of ''ample margin of safety'' developed in the *National Emissions Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants* (Benzene NESHAP) (54 FR 38044, September 14, 1989). The EPA notified Congress in the Risk Report that the Agency intended to use the Benzene NESHAP approach in making CAA section 112(f) residual risk determinations (EPA–453/R–99–001, p. ES–11). The EPA subsequently adopted this approach in its residual risk determinations and the Court upheld the EPA's interpretation that CAA section 112(f)(2) incorporates the approach established in the Benzene

[18] 77 FR 9365 (February 16, 2012).

[19] UARG petitioned the Agency to delist coal-fired EGUs, which represent only a portion of the listed source category. The EPA believed it was not permitted to delist a portion of a source category, where that source category poses cancer risks. *NRDC* v. *U.S. EPA,* 489 F.3d 1364 (D.C. Cir. 2007). Specifically, in *NRDC,* the D.C. Circuit held that the Agency's attempt to delist a ''low-risk'' subcategory was ''contrary to the plain language of the statute,'' and that the statute only authorized the Agency to remove source categories pursuant to CAA section 112(c)(9). *Id.* at 1373 (''Because EPA's interpretation of Section 112(c)(9) as allowing it to exempt the risk-based subcategory is contrary to the plain language of the statute, the EPA's interpretation fails at *Chevron* step one.'').

[20] U.S. EPA, 2011. *Supplement to the Non-Hg Case Study Chronic Inhalation Risk Assessment in Support of the Appropriate and Necessary Finding for Coal- and Oil-Fired Electric Generating Units.* November. EPA–452/R–11–013. Docket ID No. EPA–HQ–OAR–2009–0234–19912.

NESHAP. *See NRDC* v. *EPA,* 529 F.3d 1077, 1083 (D.C. Cir. 2008).

The approach incorporated into the CAA and used by the EPA to evaluate residual risk and to develop standards under CAA section 112(f)(2) is a two-step approach. In the first step, the EPA determines whether risks are acceptable. This determination ''considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual lifetime [cancer] risk (MIR) [21] of approximately 1 in 10 thousand.'' 54 FR 38045, September 14, 1989. If risks are unacceptable, the EPA must determine the emissions standards necessary to reduce risk to an acceptable level without considering costs. In the second step of the approach, the EPA considers whether the emissions standards provide an ample margin of safety to protect public health ''in consideration of all health information, including the number of persons at risk levels higher than approximately 1 in 1 million, as well as other relevant factors, including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision.'' *Id.* The EPA must promulgate emission standards necessary to provide an ample margin of safety to protect public health. After conducting the ample margin of safety analysis, we consider whether a more stringent standard is necessary to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

CAA section 112(d)(6) separately requires the EPA to review standards promulgated under CAA section 112 and revise them ''as necessary (taking into account developments in practices, processes, and control technologies)'' no less often than every 8 years. In conducting this review, which we call the ''technology review,'' the EPA is not required to recalculate the MACT floor. *Natural Resources Defense Council (NRDC)* v. *EPA,* 529 F.3d 1077, 1084 (D.C. Cir. 2008). *Association of Battery Recyclers, Inc.* v. *EPA,* 716 F.3d 667 (D.C. Cir. 2013). The EPA may consider cost in deciding whether to revise the standards pursuant to CAA section 112(d)(6).

B. What is this source category and how does the current NESHAP regulate its HAP emissions?

The NESHAP for the Coal- and Oil-Fired EGU source category (commonly referred to as MATS) were initially promulgated on February 16, 2012 (77 FR 9304), under title 40 part 63, subpart UUUUU. The MATS rule was amended on April 19, 2012 (77 FR 23399), to correct typographical errors and certain preamble text that was inconsistent with regulatory text; on April 24, 2013 (78 FR 24073), to update certain emission limits and monitoring and testing requirements applicable to new sources; on November 19, 2014 (79 FR 68777), to revise definitions for startup and shutdown and to finalize work practice standards and certain monitoring and testing requirements applicable during periods of startup and shutdown; and on April 6, 2016 (81 FR 20172), to correct conflicts between preamble and regulatory text and to clarify regulatory text. In addition, the electronic reporting requirements of the rule were amended on March 24, 2015 (80 FR 15510), to allow for the electronic submission of Portable Document Format (PDF) versions of certain reports until April 16, 2017, while the EPA's Emissions Collection and Monitoring Plan System (ECMPS) is revised to accept all reporting that is required by the rule, and on April 6, 2017 (82 FR 16736), and on July 2, 2018 (83 FR 30879), to extend the interim submission of PDF versions of reports through June 30, 2018, and July 1, 2020, respectively.

The MATS rule applies to coal- and oil-fired EGUs located at both major and area sources of HAP emissions. The sources subject to the MATS rule include each individual or group of coal- or oil-fired EGUs. An existing affected source is the collection of coal- or oil-fired EGUs in a subcategory within a single contiguous area and under common control. A new affected source is each coal- or oil-fired EGU for which construction or reconstruction began after May 3, 2011. As previously stated in section I of this preamble, an electric utility steam generating unit is a fossil fuel-fired combustion unit of more than 25 megawatts (MW) that serves a generator that produces electricity for sale. A unit that cogenerates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MW electric output to any utility power distribution system for sale is also considered an electric utility steam generating unit. The MATS rule defines additional terms for determining rule applicability, including, but not limited to, definitions for ''Coal-fired electric utility steam generating unit,'' ''Oil-fired electric utility steam generating unit,'' and ''Fossil fuel-fired.'' Certain types of electric generating units are not subject to 40 CFR part 63, subpart UUUUU: Any unit designated as a major source stationary combustion turbine subject to subpart YYYY of part 63 and any unit designated as an area source stationary combustion turbine, other than an integrated gasification combined cycle (IGCC) unit; any EGU that is not a coal- or oil-fired EGU and that meets the definition of a natural gas-fired EGU in 40 CFR 63.10042; any EGU greater than 25 MW that has the capability of combusting either coal or oil, but does not meet the definition of a coal- or oil-fired EGU because it did not fire sufficient coal or oil to satisfy the average annual heat input requirement set forth in the definitions for coal-fired and oil-fired EGUs in 40 CFR 63.10042; and any electric steam generating unit combusting solid waste (*i.e.,* a solid waste incineration unit) subject to standards established under sections 129 and 111 of the CAA.

For coal-fired EGUs, the rule established standards to limit emissions of Hg, acid gas HAP, non-Hg HAP metals (*e.g.,* nickel, lead, chromium), and organic HAP (*e.g.,* formaldehyde, dioxin/furan). Standards for hydrochloric acid (HCl) serve as a surrogate for the acid gas HAP, with an alternate standard for SO_2 that may be used as a surrogate for acid gas HAP for those coal-fired EGUs with flue gas desulfurization (FGD) systems and SO_2 continuous emissions monitoring systems (CEMS) installed and operational. Standards for filterable particulate matter (fPM) serve as a surrogate for the non-Hg HAP metals, with standards for total non-Hg HAP metals and individual non-Hg HAP metals provided as alternative equivalent standards. Work practice standards limit formation and emission of the organic HAP.

For oil-fired EGUs, the rule establishes standards to limit emissions of HCl and hydrogen fluoride (HF), total HAP metals (*e.g.,* Hg, nickel, lead), and organic HAP (*e.g.,* formaldehyde, dioxin/furan). Standards for fPM serve as a surrogate for total HAP metals, with standards for total HAP metals and individual HAP metals provided as alternative equivalent standards. Work practice standards limit formation and emission of the organic HAP.

The MATS rule includes standards for existing and new EGUs for seven subcategories: Two for coal-fired EGUs, one for IGCC EGUs, one for solid oil-derived fuel-fired EGUs, and three for liquid oil-fired EGUs. EGUs in six of the subcategories are subject to numeric emission limits for the pollutants

[21] Although defined as ''maximum individual risk,'' MIR refers only to cancer risk. MIR, one metric for assessing cancer risk, is the estimated risk if an individual were exposed to the maximum level of a pollutant for a lifetime.

described above except for organic HAP. Organic HAP are regulated by a work practice standard that requires periodic combustion process tune-ups. EGUs in the subcategory of limited-use liquid oil-fired EGUs with an annual capacity factor of less than 8 percent of its maximum or nameplate heat input are also subject to a work practice standard consisting of periodic combustion process tune-ups, but are not subject to any numeric emission limits. Emission limits for existing EGUs and new or reconstructed EGUs are summarized in Table 2 and Table 3, respectively.

TABLE 2—EMISSION LIMITS FOR EXISTING AFFECTED EGUS

Subcategory	Pollutant	Emission limit [1]
1. Coal-fired unit not low rank virgin coal	a. fPM	3.0E–2 lb/MMBtu or 3.0E–1 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	5.0E–5 lb/MMBtu or 5.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–1 lb/TBtu or 8.0E–3 lb/GWh.
	Arsenic, As	1.1 lb/TBtu or 2.0E–2 lb/GWh.
	Beryllium, Be	2.0E–1 lb/TBtu or 2.0E–3 lb/GWh.
	Cadmium, Cd	3.0E–1 lb/TBtu or 3.0E–3 lb/GWh.
	Chromium, Cr	2.8 lb/TBtu or 3.0E–2 lb/GWh.
	Cobalt, Co	8.0E–1 lb/TBtu or 8.0E–3 lb/GWh.
	Lead, Pb	1.2 lb/TBtu or 2.0E–2 lb/GWh.
	Manganese, Mn	4.0 lb/TBtu or 5.0E–2 lb/GWh.
	Nickel, Ni	3.5 lb/TBtu or 4.0E–2 lb/GWh.
	Selenium, Se	5.0 lb/TBtu or 6.0E–2 lb/GWh.
	b. HCl	2.0E–3 lb/MMBtu or 2.0E–2 lb/MWh.
	OR	OR
	SO_2 [2]	2.0E–1 lb/MMBtu or 1.5 lb/MWh.
	c. Hg	1.2 lb/TBtu or 1.3E–2 lb/GWh.
2. Coal-fired unit low rank virgin coal	a. fPM	3.0E–2 lb/MMBtu or 3.0E–1 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	5.0E–5 lb/MMBtu or 5.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–1 lb/TBtu or 8.0E–3 lb/GWh.
	Arsenic, As	1.1 lb/TBtu or 2.0E–2 lb/GWh.
	Beryllium, Be	2.0E–1 lb/TBtu or 2.0E–3 lb/GWh.
	Cadmium, Cd	3.0E–1 lb/TBtu or 3.0E–3 lb/GWh.
	Chromium, Cr	2.8 lb/TBtu or 3.0E–2 lb/GWh.
	Cobalt, Co	8.0E–1 lb/TBtu or 8.0E–3 lb/GWh.
	Lead, Pb	1.2 lb/TBtu or 2.0E–2 lb/GWh.
	Manganese, Mn	4.0 lb/TBtu or 5.0E–2 lb/GWh.
	Nickel, Ni	3.5 lb/TBtu or 4.0E–2 lb/GWh.
	Selenium, Se	5.0 lb/TBtu or 6.0E–2 lb/GWh.
	b. HCl	2.0E–3 lb/MMBtu or 2.0E–2 lb/MWh.
	OR	OR
	SO_2 [2]	2.0E–1 lb/MMBtu or 1.5 lb/MWh.
	c. Hg	4.0 lb/TBtu or 4.0E–2 lb/GWh.
3. IGCC unit	a. fPM	4.0E–2 lb/MMBtu or 4.0E–1 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	6.0E–5 lb/MMBtu or 5.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	1.4 lb/TBtu or 2.0E–2 lb/GWh.
	Arsenic, As	1.5 lb/TBtu or 2.0E–2 lb/GWh.
	Beryllium, Be	1.0E–1 lb/TBtu or 1.0E–3 lb/GWh.
	Cadmium, Cd	1.5E–1 lb/TBtu or 2.0E–3 lb/GWh.
	Chromium, Cr	2.9 lb/TBtu or 3.0E–2 lb/GWh.
	Cobalt, Co	1.2 lb/TBtu or 2.0E–2 lb/GWh.
	Lead, Pb	1.9E+2 lb/MMBtu or 1.8 lb/MWh.
	Manganese, Mn	2.5 lb/TBtu or 3.0E–2 lb/GWh.
	Nickel, Ni	6.5 lb/TBtu or 7.0E–2 lb/GWh.
	Selenium, Se	2.2E+1 lb/TBtu or 3.0E–1 lb/GWh.
	b. HCl	5.0E–4 lb/MMBtu or 5.0E–3 lb/MWh.
	c. Hg	2.5 lb/TBtu or 3.0E–2 lb/GWh.
4. Liquid oil-fired unit—continental (excluding limited-use liquid oil-fired subcategory units).	a. fPM	3.0E–2 lb/MMBtu or 3.0E–1 lb/MWh.
	OR	OR
	Total HAP metals	8.0E–4 lb/MMBtu or 8.0E–3 lb/MWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	1.3E+1 lb/TBtu or 2.0E–1 lb/GWh.
	Arsenic, As	2.8 lb/TBtu or 3.0E–2 lb/GWh.
	Beryllium, Be	2.0E–1 lb/TBtu or 2.0E–3 lb/GWh.
	Cadmium, Cd	3.0E–1 lb/TBtu or 2.0E–3 lb/GWh.
	Chromium, Cr	5.5 lb/TBtu or 6.0E–2 lb/GWh.

TABLE 2—EMISSION LIMITS FOR EXISTING AFFECTED EGUS—Continued

Subcategory	Pollutant	Emission limit [1]
	Cobalt, Co	2.1E+1 lb/TBtu or 3.0E–1 lb/GWh.
	Lead, Pb	8.1 lb/TBtu or 8.0E–2 lb/GWh.
	Manganese, Mn	2.2E+1 lb/TBtu or 3.0E–1 lb/GWh.
	Nickel, Ni	1.1E+2 lb/TBtu or 1.1 lb/GWh.
	Selenium, Se	3.3 lb/TBtu or 4.0E–2 lb/GWh.
	Hg	2.0E–1 lb/TBtu or 2.0E–3 lb/GWh.
	b. HCl	2.0E–3 lb/MMBtu or 1.0E–2 lb/MWh.
	c. HF	4.0E–4 lb/MMBtu or 4.0E–3 lb/MWh.
5. Liquid oil-fired unit—non-continental (excluding limited-use liquid oil-fired subcategory units).	a. fPM	3.0E–2 lb/MMBtu or 3.0E–1 lb/MWh.
	OR	OR
	Total HAP metals	6.0E–4 lb/MMBtu or 7.0E–3 lb/MWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	2.2 lb/TBtu or 2.0E–2 lb/GWh.
	Arsenic, As	4.3 lb/TBtu or 8.0E–2 lb/GWh.
	Beryllium, Be	6.0E–1 lb/TBtu or 3.0E–3 lb/GWh.
	Cadmium, Cd	3.0E–1 lb/TBtu or 3.0E–3 lb/GWh.
	Chromium, Cr	3.1E+1 lb/TBtu or 3.0E–1 lb/GWh.
	Cobalt, Co	1.1E+2 lb/TBtu or 1.4 lb/GWh.
	Lead, Pb	4.9 lb/TBtu or 8.0E–2 lb/GWh.
	Manganese, Mn	2.0E+1 lb/TBtu or 3.0E–1 lb/GWh.
	Nickel, Ni	4.7E+2 lb/TBtu or 4.1 lb/GWh.
	Selenium, Se	9.8 lb/TBtu or 2.0E–1 lb/GWh.
	Hg	4.0E–2 lb/TBtu or 4.0E–4 lb/GWh.
	b. HCl	2.0E–4 lb/MMBtu or 2.0E–3 lb/MWh.
	c. HF	6.0E–5 lb/MMBtu or 5.0E–4 lb/MWh.
6. Solid oil-derived fuel-fired unit	a. fPM	8.0E–3 lb/MMBtu or 9.0E–2 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	4.0E–5 lb/MMBtu or 6.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–1 lb/TBtu or 7.0E–3 lb/GWh.
	Arsenic, As	3.0E–1 lb/TBtu or 5.0E–3 lb/GWh.
	Beryllium, Be	6.0E–2 lb/TBtu or 5.0E–4 lb/GWh.
	Cadmium, Cd	3.0E–1 lb/TBtu or 4.0E–3 lb/GWh.
	Chromium, Cr	8.0E–1 lb/TBtu or 2.0E–2 lb/GWh.
	Cobalt, Co	1.1 lb/TBtu or 2.0E–2 lb/GWh.
	Lead, Pb	8.0E–1 lb/TBtu or 2.0E–2 lb/GWh.
	Manganese, Mn	2.3 lb/TBtu or 4.0E–2 lb/GWh.
	Nickel, Ni	9.0 lb/TBtu or 2.0E–1 lb/GWh.
	Selenium, Se	1.2 lb/Tbtu 2.0E–2 lb/GWh.
	b. HCl	5.0E–3 lb/MMBtu or 8.0E–2 lb/MWh.
	OR	OR
	SO_2 [2]	3.0E–1 lb/MMBtu or 2.0 lb/MWh.
	c. Hg	2.0E–1 lb/TBtu or 2.0E–3 lb/GWh.

[1] Units of emission limits:
lb/MMBtu = pounds pollutant per million British thermal units fuel input;
lb/TBtu = pounds pollutant per trillion British thermal units fuel input;
lb/MWh = pounds pollutant per megawatt-hour electric output (gross); and
lb/GWh = pounds pollutant per gigawatt-hour electric output (gross).
[2] Alternate SO_2 limit may be used if the EGU has some form of FGD system and SO_2 CEMS installed.

TABLE 3—EMISSION LIMITS FOR NEW OR RECONSTRUCTED AFFECTED EGUS

Subcategory	Pollutant	Emission limit [1]
1. Coal-fired unit not low rank virgin coal	a. fPM	9.0E–2 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	6.0E–2 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–3 lb/GWh.
	Arsenic, As	3.0E–3 lb/GWh.
	Beryllium, Be	6.0E–4 lb/GWh.
	Cadmium, Cd	4.0E–4 lb/GWh.
	Chromium, Cr	7.0E–3 lb/GWh.
	Cobalt, Co	2.0E–3 lb/GWh.
	Lead, Pb	2.0E–2 lb/GWh.
	Manganese, Mn	4.0E–3 lb/GWh.
	Nickel, Ni	4.0E–2 lb/GWh.

TABLE 3—EMISSION LIMITS FOR NEW OR RECONSTRUCTED AFFECTED EGUS—Continued

Subcategory	Pollutant	Emission limit [1]
	Selenium, Se	5.0E–2 lb/GWh.
	b. HCl	1.0E–2 lb/MWh.
	OR	OR
	SO_2 [2]	1.0 lb/MWh.
	c. Hg	3.0E–3 lb/GWh.
2. Coal-fired units low rank virgin coal	a. fPM	9.0E–2 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	6.0E–2 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–3 lb/GWh.
	Arsenic, As	3.0E–3 lb/GWh.
	Beryllium, Be	6.0E–4 lb/GWh.
	Cadmium, Cd	4.0E–4 lb/GWh.
	Chromium, Cr	7.0E–3 lb/GWh.
	Cobalt, Co	2.0E–3 lb/GWh.
	Lead, Pb	2.0E–2 lb/GWh.
	Manganese, Mn	4.0E–3 lb/GWh.
	Nickel, Ni	4.0E–2 lb/GWh.
	Selenium, Se	5.0E–2 lb/GWh.
	b. HCl	1.0E–2 lb/MWh.
	OR	OR
	SO_2 [2]	1.0 lb/MWh.
	c. Hg	4.0E–2 lb/GWh.
3. IGCC unit	a. fPM	7.0E–2 lb/MWh.[3]
		9.0E–2 lb/MWh.[4]
	OR	OR
	Total non-Hg HAP metals	4.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	2.0E–2 lb/GWh.
	Arsenic, As	2.0E–2 lb/GWh.
	Beryllium, Be	1.0E–3 lb/GWh.
	Cadmium, Cd	2.0E–3 lb/GWh.
	Chromium, Cr	4.0E–2 lb/GWh.
	Cobalt, Co	4.0E–3 lb/GWh.
	Lead, Pb	9.0E–3 lb/GWh.
	Manganese, Mn	2.0E–2 lb/GWh.
	Nickel, Ni	7.0E–2 lb/GWh.
	Selenium, Se	3.0E–1 lb/GWh.
	b. HCl	2.0E–3 lb/MWh.
	OR	OR
	SO_2 [2]	4.0E–1 lb/MWh.
	c. Hg	3.0E–3 lb/GWh.
4. Liquid oil-fired unit—continental (excluding limited-use liquid oil-fired subcategory units).	a. fPM	3.0E–1 lb/MWh.
	OR	OR
	Total HAP metals	2.0E–4 lb/MWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	1.0E–2 lb/GWh.
	Arsenic, As	3.0E–3 lb/GWh.
	Beryllium, Be	5.0E–4 lb/GWh.
	Cadmium, Cd	2.0E–4 lb/GWh.
	Chromium, Cr	2.0E–2 lb/GWh.
	Cobalt, Co	3.0E–2 lb/GWh.
	Lead, Pb	8.0E–3 lb/GWh.
	Manganese, Mn	2.0E–2 lb/GWh.
	Nickel, Ni	9.0E–2 lb/GWh.
	Selenium, Se	2.0E–2 lb/GWh.
	Hg	1.0E–4 lb/GWh.
	b. HCl	4.0E–4 lb/MWh.
	c. HF	4.0E–4 lb/MWh.
5. Liquid oil-fired unit—non-continental (excluding limited-use liquid oil-fired subcategory units).	a. fPM	2.0E–1 lb/MWh.
	OR	OR
	Total HAP metals	7.0E–3 lb/MWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–3 lb/GWh.
	Arsenic, As	6.0E–2 lb/GWh.

TABLE 3—EMISSION LIMITS FOR NEW OR RECONSTRUCTED AFFECTED EGUS—Continued

Subcategory	Pollutant	Emission limit [1]
	Beryllium, Be	2.0E–3 lb/GWh.
	Cadmium, Cd	2.0E–3 lb/GWh.
	Chromium, Cr	2.0E–2 lb/GWh.
	Cobalt, Co	3.0E–1 lb/GWh.
	Lead, Pb	3.0E–2 lb/GWh.
	Manganese, Mn	1.0E–1 lb/GWh.
	Nickel, Ni	4.1 lb/GWh.
	Selenium, Se	2.0E–2 lb/GWh.
	Hg	4.0E–4 lb/GWh.
	b. HCl	2.0E–3 lb/MWh.
	c. HF	5.0E–4 lb/MWh.
6. Solid oil-derived fuel-fired unit	a. fPM	3.0E–2 lb/MWh.
	OR	OR
	Total non-Hg HAP metals	6.0E–1 lb/GWh.
	OR	OR
	Individual HAP metals:	
	Antimony, Sb	8.0E–3 lb/GWh.
	Arsenic, As	3.0E–3 lb/GWh.
	Beryllium, Be	6.0E–4 lb/GWh.
	Cadmium, Cd	7.0E–4 lb/GWh.
	Chromium, Cr	6.0E–3 lb/GWh.
	Cobalt, Co	2.0E–3 lb/GWh.
	Lead, Pb	2.0E–2 lb/GWh.
	Manganese, Mn	7.0E–3 lb/GWh.
	Nickel, Ni	4.0E–2 lb/GWh.
	Selenium, Se	6.0E–3 lb/GWh.
	b. HCl	4.0E–4 lb/MWh.
	OR	OR
	SO_2 [2]	1.0 lb/MWh.
	c. Hg	2.0E–3 lb/GWh.

[1] Units of emission limits:
lb/MWh = pounds pollutant per megawatt-hour electric output (gross); and
lb/GWh = pounds pollutant per gigawatt-hour electric output (gross).
[2] Alternate SO_2 limit may be used if the EGU has some form of FGD system (or, in the case of IGCC EGUs, some other acid gas removal system either upstream or downstream of the combined cycle block) and SO_2 CEMS installed.
[3] Duct burners on syngas; gross output.
[4] Duct burners on natural gas; gross output.

C. What data collection activities were conducted to support this action?

The EPA did not issue a new information collection request (ICR) to affected coal- and oil-fired EGUs to obtain the data used to support this action, but did use some information from the 2010 ICR which collected data during development of the MATS rule. The data and data sources used to conduct the residual risk assessment and technology review for the Coal- and Oil-Fired EGU source category are described below in section IV.D of this preamble.

D. What other relevant background information and data are available?

The EPA used multiple sources of information to support this proposed action. A comprehensive list of facilities and EGUs that are subject to the MATS rule was compiled primarily using publicly available information reported to the EPA and information contained in the Agency's National Electric Energy Data System (NEEDS) database.[22] Affected sources are required to use the 40 CFR part 75-based ECMPS [23] for reporting emissions and related data either directly for EGUs that use Hg, HCl, HF, or SO_2 CEMS or Hg sorbent traps for compliance purposes or indirectly as PDF files for EGUs that use performance test results, PM continuous parameter monitoring system (CPMS) data, or PM CEMS for compliance purposes. Directly submitted data are maintained in ECMPS; indirectly submitted data are maintained in WebFIRE.[24] The NEEDS database contains generation unit information used in the Agency's power sector modeling. Other sources used to refine the facility list included an EPA technical support document that contained a list of potentially affected EGUs in U.S. territories,[25] the U.S. Department of Energy's Energy Information Administration's (EIA's) list of existing generators that reported for 2016 under Form EIA–860,[26] and the list of coal-fired EGUs included in a June 2018 Electric Power Research Institute (EPRI) technical report that summarizes EPRI's evaluation of HAP emissions and their associated inhalation health risks from coal-fired power plants after implementation of MATS.[27] As of early 2018, we estimate

[22] *See https://www.epa.gov/airmarkets/power-sector-modeling-platform-v515.*

[23] *See https://ampd.epa.gov/ampd/.*

[24] *See https://cfpub.epa.gov/webfire; https://www.epa.gov/electronic-reporting-air-emissions/webfire.*

[25] U.S. EPA, October 2014. *Technical Support Document for Calculating Carbon Pollution Goals for Existing Power Plants in Territories and Areas of Indian Country.* Available at *https://archive.epa.gov/epa/sites/production/files/2014-10/documents/20141028tsd-supplemental-proposal.pdf.*

[26] *See https://www.eia.gov/electricity/data/eia860/.*

[27] EPRI. June 8, 2018. *Hazardous Air Pollutants (HAPs) Emission Estimates and Inhalation Human Health Risk Assessment for U.S. Coal-Fired Electric Generating Units: 2017 Base Year Post-MATS Evaluation.* Available at *https://www.epri.com/#/pages/product/3002013577/?lang=en. Note:* There is a companion June 22, 2018 EPRI technical report, *Multi-Pathway Human Health Risk Assessment for Coal-Fired Power Plants,* that describes EPRI's

Continued

that there are 713 existing coal- and oil-fired EGUs located at 323 facilities that are subject to 40 CFR part 63, subpart UUUUU.

In developing the RTR emissions dataset for the risk review, the primary sources used to estimate annual HAP emissions were the emissions data as reported to the ECMPS and WebFIRE databases by facilities with affected EGUs. Emissions release point parameters and locations for each EGU were primarily based on information reported to the ECMPS and generator-level specific information about existing generators and their associated environmental equipment that is collected by the EIA under Form EIA–860. The EPA sources of information that were used to supplement the ECMPS, WebFIRE, and EIA data include emissions information collected through the 2010 ICR during development of the MATS rule and the 2014 National Emissions Inventory (NEI) database. The NEI is a database that contains information about sources that emit criteria air pollutants, their precursors, and HAP. The database includes estimates of annual air pollutant emissions from point, nonpoint, and mobile sources in the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. The EPA collects this information and releases an updated version of the NEI database every 3 years. The NEI includes information necessary for conducting risk modeling, including annual HAP emissions estimates from individual emission points at facilities and the related emissions release parameters. The June 2018 EPRI technical report was also used as a source of supplemental information.

In conducting the technology review, the EPA examined information submitted to the EPA's ECMPS as well as information that supports previous 40 CFR part 63, subpart UUUUU actions to identify technologies currently being used by affected EGUs and determine if there have been developments in practices, processes, or control technologies. In addition to the ECMPS data, we reviewed regulatory actions for similar combustion sources and conducted a review of literature published by industry organizations, technical journals, and government organizations.

multi-pathway human health assessment of HAP emissions from five coal-fired electric facilities based on 2017 configurations (available at *https://www.epri.com/#/pages/product/3002013523/?lang=en*).

V. RTR Analytical Procedures and Decision-Making

In this section, we describe the analyses performed to support the proposed decisions for the RTR and other issues addressed in this proposal.

A. How do we consider risk in our decision-making?

As discussed in section IV.A of this preamble and in the Benzene NESHAP, in evaluating and developing standards under CAA section 112(f)(2), we apply a two-step approach to determine whether or not risks are acceptable and to determine if the standards provide an ample margin of safety to protect public health. As explained in the Benzene NESHAP, ''the first step judgment on acceptability cannot be reduced to any single factor'' and, thus, ''[t]he Administrator believes that the acceptability of risk under section 112 is best judged on the basis of a broad set of health risk measures and information.'' 54 FR 38046, September 14, 1989. Similarly, with regard to the ample margin of safety determination, ''the Agency again considers all of the health risk and other health information considered in the first step. Beyond that information, additional factors relating to the appropriate level of control will also be considered, including cost and economic impacts of controls, technological feasibility, uncertainties, and any other relevant factors.'' *Id.*

The Benzene NESHAP approach provides flexibility regarding factors the EPA may consider in making determinations and how the EPA may weigh those factors for each source category. The EPA conducts a risk assessment that provides estimates of the MIR posed by the HAP emissions from each source in the source category, the hazard index (HI) for chronic exposures to HAP with the potential to cause noncancer health effects, and the hazard quotient (HQ) for acute exposures to HAP with the potential to cause noncancer health effects.[28] The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect. The scope of the EPA's risk analysis is consistent with the EPA's response to comments on our policy under the Benzene NESHAP where the EPA explained that:

> [t]he policy chosen by the Administrator permits consideration of multiple measures of health risk. Not only can the MIR figure be considered, but also incidence, the presence of non-cancer health effects, and the uncertainties of the risk estimates. In this way, the effect on the most exposed individuals can be reviewed as well as the impact on the general public. These factors can then be weighed in each individual case. This approach complies with the *Vinyl Chloride* mandate that the Administrator ascertain an acceptable level of risk to the public by employing his expertise to assess available data. It also complies with the Congressional intent behind the CAA, which did not exclude the use of any particular measure of public health risk from the the EPA's consideration with respect to CAA section 112 regulations, and thereby implicitly permits consideration of any and all measures of health risk which the Administrator, in his judgment, believes are appropriate to determining what will 'protect the public health'.

See 54 FR 38057, September 14, 1989. Thus, the level of the MIR is only one factor to be weighed in determining acceptability of risk. The Benzene NESHAP explained that ''an MIR of approximately one in 10 thousand should ordinarily be the upper end of the range of acceptability. As risks increase above this benchmark, they become presumptively less acceptable under CAA section 112, and would be weighed with the other health risk measures and information in making an overall judgment on acceptability. Or, the Agency may find, in a particular case, that a risk that includes an MIR less than the presumptively acceptable level is unacceptable in the light of other health risk factors.'' *Id.* at 38045. Similarly, with regard to the ample margin of safety analysis, the EPA stated in the Benzene NESHAP that: ''EPA believes the relative weight of the many factors that can be considered in selecting an ample margin of safety can only be determined for each specific source category. This occurs mainly because technological and economic factors (along with the health-related factors) vary from source category to source category.'' *Id.* at 38061. We also consider the uncertainties associated with the various risk analyses, as discussed earlier in this preamble, in our determinations of acceptability and ample margin of safety.

The EPA notes that it has not considered certain health information to date in making residual risk determinations. At this time, we do not attempt to quantify the HAP risk that may be associated with emissions from other facilities that do not include the

[28] The MIR is defined as the cancer risk associated with a lifetime of exposure at the highest concentration of HAP where people are likely to live. The HQ is the ratio of the potential exposure to the HAP to the level at or below which no adverse chronic noncancer effects are expected; the HI is the sum of HQs for HAP that affect the same target organ or organ system.

source category under review, mobile source emissions, natural source emissions, persistent environmental pollution, or atmospheric transformation in the vicinity of the sources in the category.

The EPA understands the potential importance of considering an individual's total exposure to HAP in addition to considering exposure to HAP emissions from the source category and facility. We recognize that such consideration may be particularly important when assessing noncancer risk, where pollutant-specific exposure health reference levels (*e.g.,* reference concentrations (RfCs)) are based on the assumption that thresholds exist for adverse health effects. For example, the EPA recognizes that, although exposures attributable to emissions from a source category or facility alone may not indicate the potential for increased risk of adverse noncancer health effects in a population, the exposures resulting from emissions from the facility in combination with emissions from all of the other sources (*e.g.,* other facilities) to which an individual is exposed may be sufficient to result in an increased risk of adverse noncancer health effects. In May 2010, the Science Advisory Board (SAB) advised the EPA ''that RTR assessments will be most useful to decision makers and communities if results are presented in the broader context of aggregate and cumulative risks, including background concentrations and contributions from other sources in the area.'' [29]

In response to the SAB recommendations, the EPA incorporates cumulative risk analyses into its RTR risk assessments, including those reflected in this proposal. The Agency (1) conducts facility-wide assessments, which include source category emission points, as well as other emission points within the facilities; (2) combines exposures from multiple sources in the same category that could affect the same individuals; and (3) for some persistent and bioaccumulative pollutants, analyzes the ingestion route of exposure. In addition, the RTR risk assessments consider aggregate cancer risk from all carcinogens and aggregated noncancer HQs for all noncarcinogens affecting the same target organ or target organ system.

Although we are interested in placing source category and facility-wide HAP risk in the context of total HAP risk from all sources combined in the vicinity of each source, we are concerned about the uncertainties of doing so. Estimates of total HAP risk from emission sources other than those that we have studied in depth during this RTR review would have significantly greater associated uncertainties than the source category or facility-wide estimates. Such aggregate or cumulative assessments would compound those uncertainties, making the assessments too unreliable.

B. How do we perform the technology review?

Our technology review focuses on the identification and evaluation of developments in practices, processes, and control technologies that have occurred since the MACT standards were promulgated. Where we identify such developments, we analyze their technical feasibility, estimated costs, energy implications, and non-air environmental impacts. We also consider the emission reductions associated with applying each development. This analysis informs our decision of whether it is ''necessary'' to revise the emissions standards. In addition, we consider the appropriateness of applying controls to new sources versus retrofitting existing sources. For this exercise, we consider any of the following to be a ''development'':

- Any add-on control technology or other equipment that was not identified and considered during development of the original MACT standards;
- Any improvements in add-on control technology or other equipment (that were identified and considered during development of the original MACT standards) that could result in additional emissions reduction;
- Any work practice or operational procedure that was not identified or considered during development of the original MACT standards;
- Any process change or pollution prevention alternative that could be broadly applied to the industry and that was not identified or considered during development of the original MACT standards; and
- Any significant changes in the cost (including cost effectiveness) of applying controls (including controls the EPA considered during the development of the original MACT standards).

In addition to reviewing the practices, processes, and control technologies that were considered at the time we originally developed (or last updated) the NESHAP, we review a variety of data sources in our investigation of potential practices, processes, or controls to consider. *See* sections IV.C and IV. D of this preamble for information on the specific data sources that were reviewed as part of the technology review.

C. How do we estimate post-MACT risk posed by the source category?

In this section, we provide a complete description of the types of analyses that we generally perform during the risk assessment process. In some cases, we do not perform a specific analysis because it is not relevant. For example, in the absence of emissions of HAP known to be persistent and bioaccumulative in the environment (PB–HAP), we would not perform a multipathway exposure assessment. Where we do not perform an analysis, we state that we do not and provide the reason. While we present all of our risk assessment methods, we only present risk assessment results for the analyses actually conducted (*see* section VI.B of this preamble).

The EPA conducts a risk assessment that provides estimates of the MIR for cancer posed by the HAP emissions from each source in the source category, the HI for chronic exposures to HAP with the potential to cause noncancer health effects, and the HQ for acute exposures to HAP with the potential to cause noncancer health effects. The assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect. The seven sections that follow this paragraph describe how we estimated emissions and conducted the risk assessment. The docket for this rulemaking contains the following document which provides more information on the risk assessment inputs and models: *Residual Risk Assessment for the Coal- and Oil-Fired EGU Source Category in Support of the 2019 Risk and Technology Review Proposed Rule* (risk document). The methods used to assess risk (as described in the seven primary steps below) are consistent with those described by the EPA in the document reviewed by a panel of the EPA's SAB in 2009;[30] and described in the SAB review report issued in 2010. They are also consistent with the key recommendations contained in that report.

[29] Recommendations of the SAB RTR Panel are provided in their report, which is available at *https://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf.*

[30] U.S. EPA. June 2009. *Risk and Technology Review (RTR) Risk Assessment Methodologies: For Review by the EPA's Science Advisory Board with Case Studies—MACT I Petroleum Refining Sources and Portland Cement Manufacturing* (EPA–452/R–09–006). Available at *https://www3.epa.gov/airtoxics/rrisk/rtrpg.html.*

1. How did we estimate actual emissions and identify the emissions release characteristics?

Data for existing EGUs were used to create the RTR emissions dataset for the risk review as described in section IV.D of this preamble. The RTR emissions dataset includes information for 608 emission release points (*i.e.,* stacks). Because in some cases multiple EGUs are routed to a single stack or a single EGU is routed to two stacks, the number of stacks is not the same as the number of EGUs. The MATS rule regulates emissions of HAP in four pollutant categories: Hg, non-Hg metals, acid gases, and organics. As described in section IV.B of this preamble, EGUs in six subcategories are subject to numeric emission limits for specific HAP, or surrogates for those HAP, in the three pollutant categories of Hg, non-Hg metals, and acid gases. EGUs are not required to meet numeric emission limits for organic HAP or to test and report organic HAP emissions. During the 2010 ICR effort of the original MATS rulemaking process, most of the organic HAP emissions data for EGUs were at or below the detection levels of the prescribed test methods, even when long duration test runs (*i.e.,* approximately 8 hours) were required. In developing the RTR emissions dataset, the EPA reviewed the available organic HAP test results from the 2010 ICR. For each organic HAP tested, if 40 percent or more of the available test data were above test method detection limits, emissions estimates for that HAP were included in the modeling file. Emissions of the following HAP in each of the four pollutant categories were estimated for each emission release point and included in the RTR emissions dataset:

- Hg: elemental gaseous Hg, gaseous divalent Hg, particulate divalent Hg;
- Non-Hg metals: antimony, arsenic, beryllium, cadmium, hexavalent chromium, trivalent chromium, cobalt, lead, manganese, nickel, selenium;
- Acid gases: HCl, HF; and
- Organics: formaldehyde, naphthalene, 2-methylnaphthalene, phenanthrene, two dioxin congeners, three furan congeners, and seven polychlorinated biphenyls congeners.

As explained in section IV.D of this preamble, emissions estimates for the RTR emissions dataset were based primarily on data submitted via the EPA's ECMPS by facilities with affected EGUs. Calendar year 2017 data were used where available because all affected EGUs subject to numeric emission limits would be required to submit compliance data by then. Where calendar year 2017 data were not available, the most recent data available were used. CEMS emissions data for Hg, HCl, and SO_2 reported to the EPA's ECMPS were available as 2017 actual annual values (*i.e.,* pounds per year or tpy).

Some emissions data for Hg, non-Hg HAP metals, HCl, and fPM was submitted to the EPA's ECMPS, but maintained in the WebFIRE database. For those sources, the EPA extracted data associated with operations in summer 2017, when EGUs would be expected to operate more frequently given increased demand for electricity, and used those summertime emissions to estimate annual emissions of the pollutants of interest. Specifically, test averages from third quarter performance stack tests (*i.e.,* conducted between July and September 2017) for any pollutant and 30-day rolling average values as of June 30, 2017, for PM CEMS and PM CPMS were extracted and then converted from pounds of pollutant per million British thermal units or trillion British thermal units (lb/MMBtu or lb/TBtu) or pounds of pollutant per megawatt-hour or gigawatt-hour (lb/MWh or lb/GWh) to actual annual emissions using 2017 total heat input (MMBtu) or total gross load (MWh) values, as appropriate. When ECMPS-submitted data for HAP in the RTR emissions dataset were not available, actual annual emissions estimates were based on data from the 2014 NEI and the June 2018 EPRI technical report. Some annual emissions estimates were also generated using the ratio of non-Hg metals to fPM and acid gases to SO_2 from the 2010 ICR in conjunction with more recent fPM or SO_2 emissions data. Emissions data from the 2010 ICR were used to develop emission factors for the non-Hg metals and acid gases included in the RTR emissions dataset and to develop ratios based on each of those emission factors divided by average fPM or SO_2 values, respectively. Emissions data for EGUs no longer operating were excluded in the calculation of emission factors or average fPM or SO_2 values. In addition, we included in each emission factor and ratio calculation only the 2010 ICR data for EGUs where data for both the non-Hg metal HAP (*e.g.,* antimony) and fPM, or the acid gas HAP (*e.g.,* HCl) and SO_2, were available. Emission factors and emission factor-based ratios were developed for the various combinations of fuel types and emissions control device types. Actual annual HAP-specific emissions for each stack were then estimated by multiplying each emission factor-based ratio by the most recent fPM or SO_2 annual emissions value (*e.g.,* 2017 ECMPS or WebFIRE data or 2014 NEI data). Because EGUs in the subcategory of limited-use liquid oil-fired EGUs are not subject to any numeric emission limits, actual annual HAP-specific emissions were estimated using 2014 NEI data or emission factor-based ratios along with 2014 NEI data for PM and SO_2. Development of the emission factors and emission factor-based ratios is explained in the memorandum, *Emission Factor Development for RTR Risk Modeling Dataset for Coal- and Oil-fired EGUs,* which is available in the docket for this action.

The majority of the total (*i.e.,* non-speciated) Hg actual annual emissions estimates were based on data maintained in the EPA's ECMPS for CEMS data or sorbent traps or in WebFIRE for performance stack tests along with 2017 total heat input or total gross load values, as appropriate. Where such data were not available, total Hg actual annual emissions were estimated using the 2014 NEI or the June 2018 EPRI technical report. For a small number of oil-fired EGUs, EPA-developed emission factors and emission factor-based ratios were used to estimate total Hg actual annual emissions. Hg emissions were modeled as three different species: elemental gaseous Hg, gaseous divalent Hg, and particulate divalent Hg. The EPA utilized Hg speciation factors—percentages based on fuel type and installed emissions control equipment—that were updated versions of those that had been used in the development of the MATS rule.[31] Total Hg emissions were then multiplied by the factors to develop the speciated Hg actual annual emissions estimates.

For the several EGUs that submitted individual non-Hg HAP metals data to the EPA, actual annual emissions were estimated using the stack test values maintained in WebFIRE and 2017 total heat input or total gross load values, as appropriate. The majority of the non-Hg HAP metals actual annual emissions estimates were based on emission factor-based ratios for non-Hg HAP metals and fPM annual emissions values. Chromium emissions were modeled as hexavalent chromium (Cr(VI)) and trivalent chromium (Cr(III)). Actual annual emissions of Cr(VI) and Cr(III) were estimated by multiplying total chromium emissions by the

[31] *See* Attachment E of the *Risk Modeling Dataset Memo* for the list of Hg speciation factors utilized in compiling the RTR emissions dataset for the risk review, available in the docket for this action. *See* Appendix G of the Technical Support Document for the Proposed Rule Emissions Inventories (available in the rulemaking docket at EPA–HQ–OAR–2009–0234–19908) for Hg speciation factors used in the development of MATS.

speciation factors for coal or oil, as appropriate.

Actual annual emissions estimates for HCl for EGUs that submitted data to the EPA's ECMPS were based on those ECMPS CEMS data or WebFIRE performance stack test data and 2017 total heat input or total gross load values, as appropriate. Where acid gas HAP data were not available in the WebFIRE database, but SO_2 data were available in the ECMPS for requirements other than those in the MATS rule (*e.g.,* the acid rain rule), emission factor-based ratios for the acid gas HAP (*i.e.,* HCl and HF) and SO_2 annual emissions values were used to estimate actual annual HCl and HF emissions. In some instances, actual annual HCl and HF emissions were estimated based on emission factor-based ratios and 2014 NEI data for SO_2. In a small number of other instances, actual annual HCl and HF emissions were estimated using the June 2018 EPRI technical report.

As previously explained, EGUs are not required to meet numeric emission limits for organic HAP or to test and report organic HAP emissions. Actual annual emissions for the 16 organic HAP included in the RTR emissions dataset are based on EPA-developed representative detection level (RDL) equivalent emissions values (lb/MMBtu) based on fuel type. RDL equivalent emissions values for 15 of the organic HAP are based on the averages of better-performing unit method detection levels across many source categories. Because we did not have an RDL analysis across source categories for formaldehyde, detection levels from the 2010 ICR data were used to develop the RDL equivalent emissions value for formaldehyde. Actual annual emissions of the 16 organic HAP were estimated by multiplying the RDL equivalent emissions values by 2017 total heat input. Development of the RDL equivalent emissions values is explained in the memorandum, *Development of Representative Detection Levels of Certain Organic HAP Expressed as Pounds per Million British Thermal Units of Fuel Input for RTR Risk Modeling Dataset for Coal- and Oil-fired EGUs,* which is available in the docket for this action.

Stack parameter values and locations for each emissions release point included in the RTR emissions dataset were primarily based on information reported to the ECMPS and generator-level specific information about existing generators and their associated environmental equipment that is collected under Form EIA–860. Specifically, the ECMPS was the primary source for stack height, diameter, and latitude/longitude coordinates, and the EIA–860 database was the primary source for stack temperature, velocity, and flow rate. Other sources of information that were used to fill gaps in the site-specific emissions release point data included the 2014 NEI, parameters from similar stacks at a specific facility, and default parameter values based on MACT source category 2014 NEI information.

The RTR emissions dataset was refined as necessary following a quality assurance check of source locations, emissions release characteristics, and annual emissions estimates. Latitude and longitude coordinates were checked using Google Earth® to ensure that stack locations were correct. Stack parameters were checked to ensure that they were within acceptable quality assurance range check boundaries. Emissions estimates were reviewed for completeness and accuracy. Additional details on the data and methods used to develop ''actual'' emissions estimates for the RTR emissions dataset are provided in the memorandum, *Development of the RTR Risk Modeling Dataset for the Coal- and Oil-Fired EGU Source Category* (*Risk Modeling Dataset Memo*), included as Appendix 1 of the risk document, which is available in the docket for this action.

A comparison of the actual annual HAP emissions in 2017 to the annual HAP emissions prior to promulgation of the MATS rule shows a 96-percent reduction in total HAP emissions from coal- and oil-fired EGUs. The actual emissions from coal- and oil-fired EGUs for 2017 and estimated emissions from 2010 are shown in Table 4. Estimates of pre-MATS emissions of organic HAP were not available. As discussed previously in this section, the 2017 emissions of organic HAP are based on RDL equivalent emissions values; the actual 2017 emissions are likely lower than the estimate of 3 tpy.

TABLE 4—HAP EMISSIONS FROM COAL- AND OIL-FIRED EGUS PRE- AND POST-MATS

Pollutant	2010 Emissions (tons) [32]	2017 Emissions (tons)	Reduction (%)
Hg	29	4	86
Acid Gases	125,708	4,831	96
Non-Hg Metals	1,170	221	81
Organic HAP	*	<3	*
Total	126,907	5,059	96

Note: The compliance date for the vast majority of affected EGUs was on or before April 16, 2016.
* Not available.

2. How did we estimate MACT-allowable emissions?

The available emissions data in the RTR emissions dataset include estimates of the mass of HAP emitted during a specified annual time period. These ''actual'' emission levels are often lower than the emission levels allowed under the requirements of the current MACT standards. The emissions allowed under the MACT standards are referred to as the ''MACT-allowable'' emissions. We discussed the consideration of both MACT-allowable and actual emissions in the final Coke Oven Batteries RTR (70 FR 19998–19999, April 15, 2005) and in the proposed and final Hazardous Organic NESHAP RTR (71 FR 34428, June 14, 2006, and 71 FR 76609, December 21, 2006, respectively). In those actions, we noted that assessing the risk at the MACT-allowable level is inherently reasonable since that risk reflects the maximum level facilities could emit and still comply with national emission standards. We also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP approach. (54 FR 38044, September 14, 1989.)

[32] *Memorandum: Emissions Overview: Hazardous Air Pollutants in Support of the Final Mercury and Air Toxics Standard.* EPA–454/R–11–014. November 2011; Docket ID No. EPA–HQ–OAR–2009–0234–19914.

MACT-allowable annual emissions of Hg, non-Hg HAP metals, and acid gas HAP were estimated using numeric emission limits for existing sources in the MATS rule along with 2017 total heat input. For Hg, allowable annual emissions of total Hg were estimated by multiplying subcategory-specific Hg emission limits by 2017 total heat input. Allowable annual emissions of elemental gaseous Hg, gaseous divalent Hg, and particulate divalent Hg were estimated by multiplying annual emissions of total Hg by EPA-developed Hg speciation factors which are based on fuel type and emissions control device type.

With regard to non-Hg HAP metals, performance stack test data in almost all instances was for fPM, a surrogate for non-Hg HAP metals, and, as such, allowable annual emissions were estimated using the MATS rule's fPM emission limits. Specifically, allowable annual emissions of the non-Hg HAP metals were estimated by multiplying subcategory-based fPM emission limits by 2017 total heat input and by the emission factor-based ratios for non-Hg HAP metals that were calculated by the EPA. Allowable annual emissions of chromium as Cr(VI) and Cr(III) were estimated by multiplying the total chromium allowable emissions estimates by the chromium speciation factors for coal or oil, as appropriate.

For acid gas HAP, allowable annual emissions of HCl and HF from oil-fired EGUs were estimated by multiplying subcategory-specific HCl and HF emission limits by 2017 total heat input. With regard to acid gas HAP for coal-fired EGUs, some coal-fired sources submitted data for HCl, a surrogate for acid gas HAP, whereas other sources submitted data for SO_2, a surrogate for acid gas HAP for certain coal-fired EGUs. Allowable annual emissions of HCl and HF from coal-fired EGUs were estimated two different ways—one based on the MATS rule's HCl emission limits and HF actual emissions adjusted using an HCl emissions ratio and the other based on the MATS rule's SO_2 emission limits and emission factor-based ratios—and the more conservative estimate was used. In the first approach, allowable annual emissions of HCl were estimated by multiplying subcategory-specific HCl emission limits by 2017 total heat input, and allowable annual emissions of HF were estimated by multiplying actual annual emissions of HF by a ratio of HCl allowable annual emissions to HCl actual annual emissions. In the second approach, allowable annual emissions of HCl and HF were estimated by multiplying subcategory-based SO_2 emission limits by 2017 total heat input and by the emission factor-based ratios for HCl and HF that were calculated by the EPA.

Because there are no numeric emission limits for organic HAP, allowable annual emissions for the 16 organic HAP were assumed equal to the actual annual emissions estimates for the 16 organic HAP. The *Risk Modeling Dataset Memo,* available in the docket for this action, contains additional information on the development of estimated MACT-allowable emissions.

3. How do we conduct dispersion modeling, determine inhalation exposures, and estimate individual and population inhalation risk?

Both long-term and short-term inhalation exposure concentrations and health risk from the source category addressed in this proposal were estimated using the Human Exposure Model (HEM–3).[33] The HEM–3 performs three primary risk assessment activities: (1) Conducting dispersion modeling to estimate the concentrations of HAP in ambient air, (2) estimating long-term and short-term inhalation exposures to individuals residing within 50 kilometers (km) of the modeled sources, and (3) estimating individual and population-level inhalation risk using the exposure estimates and quantitative dose-response information.

a. Dispersion Modeling

The air dispersion model AERMOD, used by the HEM–3 model, is one of the EPA's preferred models for assessing air pollutant concentrations from industrial facilities.[34] To perform the dispersion modeling and to develop the preliminary risk estimates, HEM–3 draws on three data libraries. The first is a library of meteorological data, which is used for dispersion calculations. This library includes 1 year (2016) of hourly surface and upper air observations from 824 meteorological stations, selected to provide coverage of the United States and Puerto Rico. A second library of United States Census Bureau census block[35] internal point locations and populations provides the basis of human exposure calculations (U.S. Census, 2010). In addition, for each census block, the census library includes the elevation and controlling hill height, which are also used in dispersion calculations. A third library of pollutant-specific dose-response values is used to estimate health risk. These are discussed below.

b. Risk From Chronic Exposure to HAP

In developing the risk assessment for chronic exposures, we use the estimated annual average ambient air concentrations of each HAP emitted by each source in the source category. The HAP air concentrations at each nearby census block centroid located within 50 km of the facility are a surrogate for the chronic inhalation exposure concentration for all the people who reside in that census block. A distance of 50 km is consistent with both the analysis supporting the 1989 Benzene NESHAP (54 FR 38044, September 14, 1989) and the limitations of Gaussian dispersion models, including AERMOD.

For each facility, we calculate the MIR as the cancer risk associated with a continuous lifetime (24 hours per day, 7 days per week, 52 weeks per year, 70 years) exposure to the maximum concentration at the centroid of each inhabited census block. We calculate individual cancer risk by multiplying the estimated lifetime exposure to the ambient concentration of each HAP (in micrograms per cubic meter ($\mu g/m^3$)) by its unit risk estimate (URE). The URE is an upper-bound estimate of an individual's incremental risk of contracting cancer over a lifetime of exposure to a concentration of 1 microgram of the pollutant per cubic meter of air. For residual risk assessments, we generally use UREs from the EPA's Integrated Risk Information System (IRIS). For carcinogenic pollutants without IRIS values, we look to other reputable sources of cancer dose-response values, often using California EPA (CalEPA) UREs, where available. In cases where new, scientifically credible dose-response values have been developed in a manner consistent with EPA guidelines and have undergone a peer review process similar to that used by the EPA, we may use such dose-response values in place of, or in addition to, other values, if appropriate. The pollutant-specific dose-response values used to estimate health risk are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants.*To estimate individual lifetime cancer risks associated with exposure to HAP emissions from each facility in the source category, we sum the risks for

[33] For more information about HEM–3, go to *https://www.epa.gov/fera/risk-assessment-and-modeling-human-exposure-model-hem.*

[34] U.S. EPA. Revision to the *Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions* (70 FR 68218, November 9, 2005).

[35] A census block is the smallest geographic area for which census statistics are tabulated.

each of the carcinogenic HAP [36] emitted by the modeled facility. We estimate cancer risk at every census block within 50 km of every facility in the source category. The MIR is the highest individual lifetime cancer risk estimated for any of those census blocks. In addition to calculating the MIR, we estimate the distribution of individual cancer risks for the source category by summing the number of individuals within 50 km of the sources whose estimated risk falls within a specified risk range. We also estimate annual cancer incidence by multiplying the estimated lifetime cancer risk at each census block by the number of people residing in that block, summing results for all of the census blocks, and then dividing this result by a 70-year lifetime.

To assess the risk of noncancer health effects from chronic exposure to HAP, we calculate either an HQ or a target organ-specific hazard index (TOSHI). We calculate an HQ when a single noncancer HAP is emitted. Where more than one noncancer HAP is emitted, we sum the HQ for each of the HAP that affects a common target organ or target organ system to obtain a TOSHI. The HQ is the estimated exposure divided by the chronic noncancer dose-response value, which is a value selected from one of several sources. The preferred chronic noncancer dose-response value is the EPA RfC, defined as ''an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime'' (*https://iaspub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossaries andkeywordlists/search.do?details=&vocabName=IRIS%20Glossary*). In cases where an RfC from the EPA's IRIS is not available or where the EPA determines that using a value other than the RfC is appropriate, the chronic noncancer dose-response value can be a value from the following prioritized sources, which define their dose-response values similarly to the EPA: (1) The Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Level (*https://www.atsdr.cdc.gov/mrls/index.asp*); (2) the CalEPA Chronic Reference Exposure Level (REL) (*https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0*); or (3), as noted above, a scientifically credible dose-response value that has been developed in a manner consistent with EPA guidelines and has undergone a peer review process similar to that used by the EPA. The pollutant-specific dose-response values used to estimate health risks are available at *https://www.epa.gov/fera/dose-response-assessment-assessing-health-risks-associated-exposure-hazardous-air-pollutants.*

c. Risk From Acute Exposure to HAP That May Cause Health Effects Other Than Cancer

For each HAP for which appropriate acute inhalation dose-response values are available, the EPA also assesses the potential health risks due to acute exposure. For these assessments, the EPA makes conservative assumptions about emission rates, meteorology, and exposure location. We use the peak hourly emission rate,[37] worst-case dispersion conditions, and, in accordance with our mandate under section 112 of the CAA, the point of highest off-site exposure to assess the potential risk to the maximally exposed individual.

To characterize the potential health risks associated with estimated acute inhalation exposures to a HAP, we generally use multiple acute dose-response values, including acute RELs, acute exposure guideline levels (AEGLs), and emergency response planning guidelines (ERPG) for 1-hour exposure durations, if available, to calculate acute HQs. The acute HQ is calculated by dividing the estimated acute exposure by the acute dose-response value. For each HAP for which acute dose-response values are available, the EPA calculates acute HQs.

An acute REL is defined as ''the concentration level at or below which no adverse health effects are anticipated for a specified exposure duration.'' [38] Acute RELs are based on the most sensitive, relevant, adverse health effect reported in the peer-reviewed medical and toxicological literature. They are designed to protect the most sensitive individuals, including children and the elderly, in the population through the inclusion of margins of safety. Because margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours.[39] They are guideline levels for ''once-in-a-lifetime, short-term exposures to airborne concentrations of acutely toxic, high-priority chemicals.'' *Id.* at 21. The AEGL–1 is specifically defined as ''the airborne concentration (expressed as ppm (parts per million) or mg/m^3 (milligrams per cubic meter)) of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.'' The document also notes that ''Airborne concentrations below AEGL–1 represent exposure levels that can produce mild and progressively increasing but transient and nondisabling odor, taste, and sensory irritation or certain asymptomatic, nonsensory effects.'' *Id.* AEGL–2 are defined as ''the airborne

[36] The EPA's 2005 *Guidelines for Carcinogen Risk Assessment* classifies carcinogens as: ''carcinogenic to humans,'' ''likely to be carcinogenic to humans,'' and ''suggestive evidence of carcinogenic potential.'' These classifications also coincide with the terms ''known carcinogen, probable carcinogen, and possible carcinogen,'' respectively, which are the terms advocated in the EPA's *Guidelines for Carcinogen Risk Assessment,* published in 1986 (51 FR 33992, September 24, 1986). In August 2000, the document, *Supplemental Guidance for Conducting Health Risk Assessment of Chemical Mixtures* (EPA/630/R–00/002), was published as a supplement to the 1986 document. Copies of both documents can be obtained from *https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=20533&CFID=70315376&CFTOKEN=71597944.* Summing the risk of these individual compounds to obtain the cumulative cancer risk is an approach that was recommended by the EPA's SAB in their 2002 peer review of the EPA's National Air Toxics Assessment (NATA) titled *NATA—Evaluating the National-scale Air Toxics Assessment 1996 Data—an SAB Advisory,* available at *https://yosemite.epa.gov/sab/sabproduct.nsf/214C6E915BB04E14852570CA007A682C/$File/ecadv02001.pdf.*

[37] In the absence of hourly emission data, we develop estimates of maximum hourly emission rates by multiplying the average actual annual emissions rates by a factor (either a category-specific factor or a default factor of 10) to account for variability. This is documented in *Residual Risk Assessment for Coal- and Oil-Fired EGU Source Category in Support of the 2019 Risk and Technology Review Proposed Rule* and in Appendix 5 of the report: *Analysis of Data on Short-term Emission Rates Relative to Long-term Emission Rates.* Both are available in the docket for this rulemaking.

[38] CalEPA issues acute RELs as part of its Air Toxics Hot Spots Program, and the 1-hour and 8-hour values are documented in *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part I, The Determination of Acute Reference Exposure Levels for Airborne Toxicants,* which is available at *https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary.*

[39] National Academy of Sciences, 2001. *Standing Operating Procedures for Developing Acute Exposure Levels for Hazardous Chemicals,* page 2. Available at *https://www.epa.gov/sites/production/files/2015-09/documents/sop_final_standing_operating_procedures_2001.*pdf. Note that the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances ended in October 2011, but the AEGL program continues to operate at the EPA and works with the National Academies to publish final AEGLs, (*https://www.epa.gov/aegl*).

concentration (expressed as parts per million or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.'' *Id.*

ERPGs are ''developed for emergency planning and are intended as health-based guideline concentrations for single exposures to chemicals.'' [40] *Id.* at 1. The ERPG–1 is defined as ''the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or without perceiving a clearly defined, objectionable odor.'' *Id.* at 2. Similarly, the ERPG–2 is defined as ''the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.'' *Id.* at 1.

An acute REL for 1-hour exposure durations is typically lower than its corresponding AEGL–1 and ERPG–1. Even though their definitions are slightly different, AEGL–1s are often the same as the corresponding ERPG–1s, and AEGL–2s are often equal to ERPG–2s. The maximum HQs from our acute inhalation screening risk assessment typically result when we use the acute REL for a HAP. In cases where the maximum acute HQ exceeds 1, we also report the HQ based on the next highest acute dose-response value (usually the AEGL–1 and/or the ERPG–1).

For the Coal- and Oil-Fired EGU source category, facility-level acute factors (*i.e.,* multipliers) developed by the EPA were used to estimate acute emissions and the potential health risks due to acute exposure. First, 2017 total heat input (MMBtu) and boiler maximum rated heat input (MMBtu/hr) data were used to calculate an acute factor for EGUs where both values were available. Next, facility-level acute factors were calculated using a heat input-weighted average based on 2017 heat input for each EGU located within a facility fenceline. The facility-level acute factor was used for each stack at the facility. For units at facilities that did not have a facility-level factor (*e.g.,* 2017 total heat input and boiler maximum rated heat input were not available), a default facility-level value of 6 was used. The default facility-level value of 6 was developed by taking the average of the calculated facility-level factors. If the calculated facility-level acute factor was greater than 10 (*e.g.,* in cases where the EGU had a low 2017 heat input relative to the maximum rated heat input), the RTR program default acute emission adjustment factor of 10 was used. The default emission adjustment factor of 10 reflects a Texas study of short-term emissions variability, which showed that most peak emission events in a heavily-industrialized four-county area (Harris, Galveston, Chambers, and Brazoria Counties, Texas) were less than twice the annual average hourly emissions rate. The highest peak emissions event was 74 times the annual average hourly emissions rate and the 99th percentile ratio of peak hourly emissions rate to the annual average hourly emissions rate was 9.[41] Considering this analysis, to account for more than 99 percent of the peak hourly emissions, a conservative screening multiplication factor of 10 is applied to the average annual hourly emissions rate in the EPA's acute exposure screening assessments as the default approach. In this analysis, we inadvertently used allowable emissions (rather than actual emissions, which is our standard practice) in conjunction with the facility level acute factors in our screening assessment of acute risk. Because the results showed acute risks below a level of concern even with acute emissions being overstated due to the use of allowable emissions, we did not correct the analysis and consider it to clearly support the conclusion that acute risks are below a level of concern as shown in Table 5 of this preamble. A further discussion of the development of facility-level acute factors and emissions used to estimate acute exposure for the risk modeling can be found in the *Risk Modeling Dataset Memo,* available in the docket for this rulemaking.

In our acute inhalation screening risk assessment, acute impacts are deemed negligible for HAP for which acute HQs are less than or equal to 1 (even under the conservative assumptions of the screening assessment), and no further analysis is performed for these HAP. In cases where an acute HQ from the screening step is greater than 1, we consider additional site-specific data to develop a more refined estimate of the potential for acute exposures of concern.

4. How do we conduct the multipathway exposure and risk screening assessment?

The EPA conducts a tiered screening assessment examining the potential for significant human health risks due to exposures via routes other than inhalation (*i.e.,* ingestion). We first determine whether any sources in the source category emit any PB–HAP, as identified in the EPA's Air Toxics Risk Assessment Library (*See* Volume 1, Appendix D, at *https://www2.epa.gov/fera/risk-assessment-and-modeling-air-toxics-risk-assessment-reference-library.*

For the Coal- and Oil-Fired EGU source category, we identified PB–HAP emissions of lead compounds, arsenic compounds, Hg compounds, cadmium compounds, polycyclic organic matter (POM), and dioxins, so we proceeded to the next step of the evaluation. In this step, we determine whether the facility-specific emission rates of the emitted PB–HAP are large enough to create the potential for significant human health risk through ingestion exposure under reasonable worst-case conditions. To facilitate this step, we use previously developed screening threshold emission rates for several PB–HAP that are based on a hypothetical upper-end screening exposure scenario developed for use in conjunction with the EPA's Total Risk Integrated Methodology.Fate, Transport, and Ecological Exposure (TRIM.FaTE) model. The PB–HAP with screening threshold emission rates are arsenic compounds, cadmium compounds, chlorinated dibenzodioxins and furans, Hg compounds, and POM. Based on EPA estimates of toxicity and bioaccumulation potential, the pollutants above represent a conservative list for inclusion in multipathway risk assessments for RTR rules. (*See* Volume 1, Appendix D at *https://www.epa.gov/sites/production/files/201308/documents/volume_1_reflibrary.pdf*). In this assessment, we compare the facility-specific emission rates of these PB–HAP to the screening threshold emission rates for each PB–HAP to assess the potential for significant human health risks via the ingestion pathway. We call this application of the TRIM.FaTE model the Tier 1 screening assessment. The ratio of a facility's actual emission rate to the Tier 1 screening threshold emission rate is a ''screening value.''

[40] *ERPGS Procedures and Responsibilities.* March 2014. American Industrial Hygiene Association. Available at *https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponsePlanningGuidelines/Documents/ERPG%20Committee%20Standard%20Operating%20Procedures%20%20-%20March%202014%20Revision%20%28Updated%2010-2-2014%29.pdf.*

[41] Allen, *et al.,* 2004. *Variable Industrial VOC Emissions and their impact on ozone formation in the Houston Galveston Area.* Texas Environmental Research Consortium. Available at *https://www.researchgate.net/publication/237593060_Variable_Industrial_VOC_Emissions_and_their_Impact_on_Ozone_Formation_in_the_Houston_Galveston_Area.*

We derive the Tier 1 screening threshold emission rates for these PB–HAP (other than lead compounds) to correspond to a maximum excess lifetime cancer risk of 1-in-1 million (*i.e.,* for arsenic compounds, polychlorinated dibenzodioxins and furans and POM) or, for HAP that cause noncancer health effects (*i.e.,* cadmium compounds and Hg compounds), a maximum HQ of 1. If the emission rate of any one PB–HAP or combination of carcinogenic PB–HAP in the Tier 1 screening assessment exceeds the Tier 1 screening threshold emission rate for any facility (*i.e.,* the screening value is greater than 1), we conduct a second screening assessment, which we call the Tier 2 screening assessment.

In the Tier 2 screening assessment, the location of each facility that exceeds a Tier 1 screening threshold emission rate is used to refine the assumptions associated with the Tier 1 fisher and farmer exposure scenarios at that facility. A key assumption in the Tier 1 screening assessment is that a lake and/or farm is located near the facility. As part of the Tier 2 screening assessment, we use a United States Geological Survey (USGS) database to identify actual waterbodies within 50 km of each facility. We also examine the differences between local meteorology near the facility and the meteorology used in the Tier 1 screening assessment. We then adjust the previously-developed Tier 1 screening threshold emission rates for each PB–HAP for each facility based on an understanding of how exposure concentrations estimated for the screening scenario change with the use of local meteorology and USGS waterbody data. If the PB–HAP emission rates for a facility exceed the Tier 2 screening threshold emission rates and data are available, we may conduct a Tier 3 screening assessment. If PB–HAP emission rates do not exceed a Tier 2 screening value of 1, we consider those PB–HAP emissions to pose risks below a level of concern.

There are several analyses that can be included in a Tier 3 screening assessment, depending upon the extent of refinement warranted, including validating that the lakes are fishable, considering plume-rise to estimate emissions lost above the mixing layer, and considering hourly effects of meteorology and plume rise on chemical fate and transport. If the Tier 3 screening assessment indicates that risks above levels of concern cannot be ruled out, the EPA may further refine the screening assessment through a site-specific assessment.

In evaluating the potential multipathway risk from emissions of lead compounds, rather than developing a screening threshold emission rate, we compare maximum estimated chronic inhalation exposure concentrations to the level of the current NAAQS for lead.[42] Values below the level of the primary (health-based) lead NAAQS are considered to have a low potential for multipathway risk.

For further information on the multipathway assessment approach, see the risk document, which is available in the docket for this action.

5. How do we conduct the environmental risk screening assessment?

a. Adverse Environmental Effect, Environmental HAP, and Ecological Benchmarks

The EPA conducts a screening assessment to examine the potential for an adverse environmental effect as required under section 112(f)(2)(A) of the CAA. Section 112(a)(7) of the CAA defines ''adverse environmental effect'' as ''any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas.''

The EPA focuses on eight HAP, which are referred to as ''environmental HAP,'' in its screening assessment: six PB–HAP and two acid gases. The PB–HAP included in the screening assessment are arsenic compounds, cadmium compounds, dioxins/furans, POM, Hg (both inorganic Hg and methyl Hg), and lead compounds. The acid gases included in the screening assessment are HCl and HF.

HAP that persist and bioaccumulate are of particular environmental concern because they accumulate in the soil, sediment, and water. The acid gases, HCl and HF, are included due to their well-documented potential to cause direct damage to terrestrial plants. In the environmental risk screening assessment, we evaluate the following four exposure media: terrestrial soils, surface water bodies (includes water-column and benthic sediments), fish consumed by wildlife, and air. Within these four exposure media, we evaluate nine ecological assessment endpoints, which are defined by the ecological entity and its attributes. For PB–HAP (other than lead), both community-level and population-level endpoints are included. For acid gases, the ecological assessment evaluated is terrestrial plant communities.

An ecological benchmark represents a concentration of HAP that has been linked to a particular environmental effect level. For each environmental HAP, we identified the available ecological benchmarks for each assessment endpoint. We identified, where possible, ecological benchmarks at the following effect levels: probable effect levels, lowest-observed-adverse-effect level, and no-observed-adverse-effect level. In cases where multiple effect levels were available for a particular PB–HAP and assessment endpoint, we use all of the available effect levels to help us to determine whether ecological risks exist and, if so, whether the risks could be considered significant and widespread.

For further information on how the environmental risk screening assessment was conducted, including a discussion of the risk metrics used, how the environmental HAP were identified, and how the ecological benchmarks were selected, see Appendix 9 of the risk document, which is available in the docket for this action.

b. Environmental Risk Screening Methodology

For the environmental risk screening assessment, the EPA first determined whether any facilities in the Coal- and Oil-Fired EGU source category emitted any of the environmental HAP. For the Coal- and Oil-Fired EGU source category, we identified emissions of lead compounds, arsenic compounds, Hg compounds, cadmium compounds, POM, dioxins, HCl, and HF. Because one or more of the environmental HAP evaluated are emitted by at least one facility in the source category, we proceeded to the second step of the evaluation.

c. PB–HAP Methodology

The environmental screening assessment includes six PB–HAP, arsenic compounds, cadmium compounds, dioxins/furans, POM, Hg (both inorganic Hg and methyl Hg), and lead compounds. With the exception of

[42] In doing so, the EPA notes that the legal standard for a primary NAAQS—that a standard is requisite to protect public health and provide an adequate margin of safety (CAA section 109(b))—differs from the CAA section 112(f) standard (requiring, among other things, that the standard provide an ''ample margin of safety to protect public health''). However, the primary lead NAAQS is a reasonable measure of determining risk acceptability (*i.e.,* the first step of the Benzene NESHAP analysis) since it is designed to protect the most susceptible group in the human population—children, including children living near major lead emitting sources. 73 FR 67002/3; 73 FR 67000/3; 73 FR 67005/1. In addition, applying the level of the primary lead NAAQS at the risk acceptability step is conservative, since that primary lead NAAQS reflects an adequate margin of safety.

lead, the environmental risk screening assessment for PB–HAP consists of three tiers. The first tier of the environmental risk screening assessment uses the same health-protective conceptual model that is used for the Tier 1 human health screening assessment. TRIM.FaTE model simulations were used to back-calculate Tier 1 screening threshold emission rates. The screening threshold emission rates represent the emission rate in tpy that results in media concentrations at the facility that equal the relevant ecological benchmark. To assess emissions from each facility in the category, the reported emission rate for each PB–HAP was compared to the Tier 1 screening threshold emission rate for that PB–HAP for each assessment endpoint and effect level. If emissions from a facility do not exceed the Tier 1 screening threshold emission rate, the facility ''passes'' the screening assessment, and, therefore, is not evaluated further under the screening approach. If emissions from a facility exceed the Tier 1 screening threshold emission rate, we evaluate the facility further in Tier 2.

In Tier 2 of the environmental screening assessment, the screening threshold emission rates are adjusted to account for local meteorology and the actual location of lakes in the vicinity of facilities that did not pass the Tier 1 screening assessment. For soils, we evaluate the average soil concentration for all soil parcels within a 7.5-km radius for each facility and PB–HAP. For the water, sediment, and fish tissue concentrations, the highest value for each facility for each pollutant is used. If emission concentrations from a facility do not exceed the Tier 2 screening threshold emission rate, the facility ''passes'' the screening assessment and typically is not evaluated further. If emissions from a facility exceed the Tier 2 screening threshold emission rate, we evaluate the facility further in Tier 3.

As in the multipathway human health risk assessment, in Tier 3 of the environmental screening assessment, we examine the suitability of the lakes around the facilities to support life and remove those that are not suitable (*e.g.,* lakes that have been filled in or are industrial ponds), adjust emissions for plume-rise, and conduct hour-by-hour time-series assessments. If these Tier 3 adjustments to the screening threshold emission rates still indicate the potential for an adverse environmental effect (*i.e.,* facility emission rate exceeds the screening threshold emission rate), we may elect to conduct a more refined assessment using more site-specific information. If, after additional refinement, the facility emission rate still exceeds the screening threshold emission rate, the facility may have the potential to cause an adverse environmental effect.

To evaluate the potential for an adverse environmental effect from lead, we compared the average modeled air concentrations (from HEM–3) of lead around each facility in the source category to the level of the secondary NAAQS for lead. The secondary lead NAAQS is a reasonable means of evaluating environmental risk because it is set to provide substantial protection against adverse welfare effects which can include ''effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.''

d. Acid Gas Environmental Risk Methodology

The environmental screening assessment for acid gases evaluates the potential phytotoxicity and reduced productivity of plants due to chronic exposure to HF and HCl. The environmental risk screening methodology for acid gases is a single-tier screening assessment that compares modeled ambient air concentrations (from AERMOD) to the ecological benchmarks for each acid gas. To identify a potential adverse environmental effect (as defined in section 112(a)(7) of the CAA) from emissions of HF and HCl, we evaluate the following metrics: The size of the modeled area around each facility that exceeds the ecological benchmark for each acid gas, in acres and km^2; the percentage of the modeled area around each facility that exceeds the ecological benchmark for each acid gas; and the area-weighted average screening value around each facility (calculated by dividing the area-weighted average concentration over the 50-km modeling domain by the ecological benchmark for each acid gas). For further information on the environmental screening assessment approach, see Appendix 9 of the risk document, which is available in the docket for this action.

6. How do we conduct facility-wide assessments?

To put the source category risks in context, we typically examine the risks from the entire ''facility,'' where the facility includes all HAP-emitting operations within a contiguous area and under common control. In other words, we examine the HAP emissions not only from the source category emission points of interest, but also emissions of HAP from all other emission sources at the facility for which we have data. For this source category, we conducted the facility-wide assessment using a dataset compiled from the 2014 NEI. The source category records of that NEI dataset were removed, evaluated, and updated as described in section IV.D of this preamble: What other relevant background information and data are available? Once a quality assured source category dataset was available, it was placed back with the remaining records from the NEI for that facility. The facility-wide file was then used to analyze risks due to the inhalation of HAP that are emitted ''facility-wide'' for the populations residing within 50 km of each facility, consistent with the methods used for the source category analysis described above. For these facility-wide risk analyses, the modeled source category risks were compared to the facility-wide risks to determine the portion of the facility-wide risks that could be attributed to the source category addressed in this proposal. We also specifically examined the facility that was associated with the highest estimate of risk and determined the percentage of that risk attributable to the source category of interest. The risk document, available through the docket for this action, provides the methodology and results of the facility-wide analyses, including all facility-wide risks and the percentage of source category contribution to facility-wide risks.

7. How do we consider uncertainties in risk assessment?

Uncertainty and the potential for bias are inherent in all risk assessments, including those performed for this proposal. Although uncertainty exists, we believe that our approach, which used conservative tools and assumptions, ensures that our decisions are health and environmentally protective. A brief discussion of the uncertainties in the RTR emissions dataset, dispersion modeling, inhalation exposure estimates, and dose-response relationships follows below. Also included are those uncertainties specific to our acute screening assessments, multipathway screening assessments, and our environmental risk screening assessments. A more thorough discussion of these uncertainties is included in the risk document, which is available in the docket for this action. If a multipathway site-specific assessment was performed for this source category, a full discussion of the uncertainties associated with that assessment can be

found in Appendix 11 of that document, *Site-Specific Human Health Multipathway Residual Risk Assessment Report.*

a. Uncertainties in the RTR Emissions Dataset

Although the development of the RTR emissions dataset involved quality assurance/quality control processes, the accuracy of emissions values will vary depending on the source of the data, the degree to which data are incomplete or missing, the degree to which assumptions made to complete the datasets are accurate, errors in emission estimates, and other factors. The emission estimates considered in this analysis generally are annual totals for certain years, and they do not reflect short-term fluctuations during the course of a year or variations from year to year. The estimates of peak hourly emission rates for the acute effects screening assessment were based on an emission adjustment factor applied to the average annual hourly emission rates, which are intended to account for emission fluctuations due to normal facility operations.

b. Uncertainties in Dispersion Modeling

We recognize there is uncertainty in ambient concentration estimates associated with any model, including the EPA's recommended regulatory dispersion model, AERMOD. In using a model to estimate ambient pollutant concentrations, the user chooses certain options to apply. For RTR assessments, we select some model options that have the potential to overestimate ambient air concentrations (*e.g.,* not including plume depletion or pollutant transformation). We select other model options that have the potential to underestimate ambient impacts (*e.g.,* not including building downwash). Other options that we select have the potential to either under- or overestimate ambient levels (*e.g.,* meteorology and receptor locations). On balance, considering the directional nature of the uncertainties commonly present in ambient concentrations estimated by dispersion models, the approach we apply in the RTR assessments should yield unbiased estimates of ambient HAP concentrations. We also note that the selection of meteorology dataset location could have an impact on the risk estimates. As we continue to update and expand our library of meteorological station data used in our risk assessments, we expect to reduce this variability.

c. Uncertainties in Inhalation Exposure Assessment

Although every effort is made to identify all of the relevant facilities and emission points, as well as to develop accurate estimates of the annual emission rates for all relevant HAP, the uncertainties in our emission inventory likely dominate the uncertainties in the exposure assessment. Some uncertainties in our exposure assessment include human mobility, using the centroid of each census block, assuming lifetime exposure, and assuming only outdoor exposures. For most of these factors, there is neither an underestimate nor overestimate when looking at the maximum individual risk or the incidence, but the shape of the distribution of risks may be affected. With respect to outdoor exposures, actual exposures may not be as high if people spend time indoors, especially for very reactive pollutants or larger particles. For all factors, we reduce uncertainty when possible. For example, with respect to census-block centroids, we analyze large blocks using aerial imagery and adjust locations of the block centroids to better represent the population in the blocks. We also add additional receptor locations where the population of a block is not well represented by a single location.

d. Uncertainties in Dose-Response Relationships

There are uncertainties inherent in the development of the dose-response values used in our risk assessments for cancer effects from chronic exposures and noncancer effects from both chronic and acute exposures. Some uncertainties are generally expressed quantitatively, and others are generally expressed in qualitative terms. We note, as a preface to this discussion, a point on dose-response uncertainty that is stated in the EPA's *2005 Guidelines for Carcinogen Risk Assessment;* namely, that ''the primary goal of EPA actions is protection of human health; accordingly, as an Agency policy, risk assessment procedures, including default options that are used in the absence of scientific data to the contrary, should be health protective'' (the EPA's *2005 Guidelines for Carcinogen Risk Assessment,* page 1–7). This is the approach followed here as summarized in the next paragraphs.

Cancer UREs used in our risk assessments are those that have been developed to generally provide an upper bound estimate of risk.[43] That is, they represent a ''plausible upper limit to the true value of a quantity'' (although this is usually not a true statistical confidence limit). In some circumstances, the true risk could be as low as zero; however, in other circumstances the risk could be greater.[44] Chronic noncancer RfC and reference dose (RfD) values represent chronic exposure levels that are intended to be health-protective levels. To derive dose-response values that are intended to be ''without appreciable risk,'' the methodology relies upon an uncertainty factor (UF) approach,[45] which considers uncertainty, variability, and gaps in the available data. The UFs are applied to derive dose-response values that are intended to protect against appreciable risk of deleterious effects.

Many of the UFs used to account for variability and uncertainty in the development of acute dose-response values are quite similar to those developed for chronic durations. Additional adjustments are often applied to account for uncertainty in extrapolation from observations at one exposure duration (*e.g.,* 4 hours) to derive an acute dose-response value at another exposure duration (*e.g.,* 1 hour). Not all acute dose-response values are developed for the same purpose, and care must be taken when interpreting the results of an acute assessment of human health effects relative to the dose-response value or values being exceeded. Where relevant to the estimated exposures, the lack of acute dose-response values at different levels of severity should be factored into the risk characterization as potential uncertainties.

Uncertainty also exists in the selection of ecological benchmarks for the environmental risk screening assessment. We established a hierarchy of preferred benchmark sources to allow selection of benchmarks for each environmental HAP at each ecological assessment endpoint. We searched for benchmarks for three effect levels (*i.e.,* no-effects level, threshold-effect level, and probable effect level), but not all combinations of ecological assessment/environmental HAP had benchmarks for

[43] IRIS glossary (*https://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=IRIS%20Glossary*).

[44] An exception to this is the URE for benzene, which is considered to cover a range of values, each end of which is considered to be equally plausible, and which is based on maximum likelihood estimates.

[45] *See A Review of the Reference Dose and Reference Concentration Processes,* U.S. EPA, December 2002, and *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry,* U.S. EPA, 1994.

all three effect levels. Where multiple effect levels were available for a particular HAP and assessment endpoint, we used all of the available effect levels to help us determine whether risk exists and whether the risk could be considered significant and widespread.

Although we make every effort to identify appropriate human health effect dose-response values for all pollutants emitted by the sources in this risk assessment, some HAP emitted by this source category are lacking dose-response assessments. Accordingly, these pollutants cannot be included in the quantitative risk assessment, which could result in quantitative estimates understating HAP risk. To help to alleviate this potential underestimate, where we conclude similarity with a HAP for which a dose-response value is available, we use that value as a surrogate for the assessment of the HAP for which no value is available. To the extent use of surrogates indicates appreciable risk, we may identify a need to increase priority for an IRIS assessment for that substance. We additionally note that, generally speaking, HAP of greatest concern due to environmental exposures and hazard are those for which dose-response assessments have been performed, reducing the likelihood of understating risk. Further, HAP not included in the quantitative assessment are assessed qualitatively and considered in the risk characterization that informs the risk management decisions, including consideration of HAP reductions achieved by various control options.

For a group of compounds that are unspeciated (*e.g.,* glycol ethers), we conservatively use the most protective dose-response value of an individual compound in that group to estimate risk. Similarly, for an individual compound in a group (*e.g.,* ethylene glycol diethyl ether) that does not have a specified dose-response value, we also apply the most protective dose-response value from the other compounds in the group to estimate risk.

e. Uncertainties in Acute Inhalation Screening Assessments

In addition to the uncertainties highlighted above, there are several factors specific to the acute exposure assessment that the EPA conducts as part of the risk review under section 112 of the CAA. The accuracy of an acute inhalation exposure assessment depends on the simultaneous occurrence of independent factors that may vary greatly, such as hourly emissions rates, meteorology, and the presence of humans at the location of the maximum concentration. In the acute screening assessment that we conduct under the RTR program, we assume that peak emissions from the source category and worst-case meteorological conditions co-occur, thus, resulting in maximum ambient concentrations. These two events are unlikely to occur at the same time, making these assumptions conservative. We then include the additional assumption that a person is located at this point during this same time period. For this source category, these assumptions would tend to be worst-case actual exposures, as it is unlikely that a person would be located at the point of maximum exposure during the time when peak emissions and worst-case meteorological conditions occur simultaneously.

f. Uncertainties in the Multipathway and Environmental Risk Screening Assessments

For each source category, we generally rely on site-specific levels of PB–HAP or environmental HAP emissions to determine whether a refined assessment of the impacts from multipathway exposures is necessary or whether it is necessary to perform an environmental screening assessment. This determination is based on the results of a three-tiered screening assessment that relies on the outputs from models—TRIM.FaTE and AERMOD—that estimate environmental pollutant concentrations and human exposures for five PB–HAP (dioxins, POM, Hg, cadmium, and arsenic) and two acid gases (HF and HCl). For lead, we use AERMOD to determine ambient air concentrations, which are then compared to the secondary NAAQS standard for lead. Two important types of uncertainty associated with the use of these models in RTR risk assessments and inherent to any assessment that relies on environmental modeling are model uncertainty and input uncertainty.[46]

Model uncertainty concerns whether the model adequately represents the actual processes (*e.g.,* movement and accumulation) that might occur in the environment. For example, does the model adequately describe the movement of a pollutant through the soil? This type of uncertainty is difficult to quantify. However, based on feedback received from previous EPA SAB reviews and other reviews, we are confident that the models used in the screening assessments are appropriate and state-of-the-art for the multipathway and environmental screening risk assessments conducted in support of RTR.

Input uncertainty is concerned with how accurately the models have been configured and parameterized for the assessment at hand. For Tier 1 of the multipathway and environmental screening assessments, we configured the models to avoid underestimating exposure and risk. This was accomplished by selecting upper-end values from nationally representative datasets for the more influential parameters in the environmental model, including selection and spatial configuration of the area of interest, lake location and size, meteorology, surface water, soil characteristics, and structure of the aquatic food web. We also assume an ingestion exposure scenario and values for human exposure factors that represent reasonable maximum exposures.

In Tier 2 of the multipathway and environmental screening assessments, we refine the model inputs to account for meteorological patterns in the vicinity of the facility versus using upper-end national values, and we identify the actual location of lakes near the facility rather than the default lake location that we apply in Tier 1. By refining the screening approach in Tier 2 to account for local geographical and meteorological data, we decrease the likelihood that concentrations in environmental media are overestimated, thereby increasing the usefulness of the screening assessment. In Tier 3 of the screening assessments, we refine the model inputs again to account for hour-by-hour plume rise and the height of the mixing layer. We can also use those hour-by-hour meteorological data in a TRIM.FaTE run using the screening configuration corresponding to the lake location. These refinements produce a more accurate estimate of chemical concentrations in the media of interest, thereby reducing the uncertainty with those estimates. The assumptions and the associated uncertainties regarding the selected ingestion exposure scenario are the same for all three tiers.

For the environmental screening assessment for acid gases, we employ a single-tiered approach. We use the modeled air concentrations and compare those with ecological benchmarks.

For all tiers of the multipathway and environmental screening assessments, our approach to addressing model input uncertainty is generally cautious. We

[46] In the context of this discussion, the term ''uncertainty'' as it pertains to exposure and risk encompasses both *variability* in the range of expected inputs and screening results due to existing spatial, temporal, and other factors, as well as *uncertainty* in being able to accurately estimate the true result.

choose model inputs from the upper end of the range of possible values for the influential parameters used in the models, and we assume that the exposed individual exhibits ingestion behavior that would lead to a high total exposure. This approach reduces the likelihood of not identifying high risks for adverse impacts.

Despite the uncertainties, when individual pollutants or facilities do not exceed screening threshold emission rates (*i.e.,* screen out), we are confident that the potential for adverse multipathway impacts on human health is very low. On the other hand, when individual pollutants or facilities do exceed screening threshold emission rates, it does not mean that impacts are significant, only that we cannot rule out that possibility and that a refined assessment for the site might be necessary to obtain a more accurate risk characterization for the source category.

The EPA evaluates the following HAP in the multipathway and/or environmental risk screening assessments, where applicable: Arsenic, cadmium, dioxins/furans, lead, Hg (both inorganic and methyl Hg), POM, HCl, and HF. These HAP represent pollutants that can cause adverse impacts either through direct exposure to HAP in the air or through exposure to HAP that are deposited from the air onto soils and surface waters and then through the environment into the food web. These HAP represent those HAP for which we can conduct a meaningful multipathway or environmental screening risk assessment. For other HAP not included in our screening assessments, the model has not been parameterized such that it can be used for that purpose. In some cases, depending on the HAP, we may not have appropriate multipathway models that allow us to predict the concentration of that pollutant. The EPA acknowledges that other HAP beyond these that we are evaluating may have the potential to cause adverse effects and, therefore, the EPA may evaluate other relevant HAP in the future, as modeling science and resources allow.

VI. RTR Analytical Results and Proposed Decisions

A. What are the results of the risk assessment and analyses?

1. Inhalation Risk Assessment Results

Table 5 of this preamble provides a summary of the results of the inhalation risk assessment for the source category. More detailed information on the risk assessment can be found in the risk document, available in the docket for this action.

TABLE 5—COAL- AND OIL-FIRED EGU INHALATION RISK ASSESSMENT RESULTS

Number of facilities [1]	Maximum individual cancer risk (in 1 million) [2]		Population at increased risk of cancer ≥1-in-1 million		Annual cancer incidence (cases per year)		Maximum chronic noncancer TOSHI [3]		Maximum screening acute noncancer HQ [4]
	Based on . . .		Based on . . .		Based on . . .		Based on . . .		
	Actual emissions level [2]	Allowable emissions level	Actual emissions level [2]	Allowable emissions level	Actual emissions level [2]	Allowable emissions level	Actual emissions level	Allowable emissions level	Based on actual emissions level
322	9	10	193,000	636,000	0.04	0.1	0.2	0.4	HQ_{REL} = 0.09 (arsenic).

[1] Number of facilities evaluated in the risk analysis.
[2] Maximum individual excess lifetime cancer risk due to HAP emissions from the source category.
[3] Maximum TOSHI. The target organ systems with the highest TOSHI for the source category are neurological and reproductive.
[4] The maximum estimated acute exposure concentration was divided by available short-term threshold values to develop an array of HQ values. HQ values shown use the lowest available acute threshold value, which in most cases is the REL. When an HQ exceeds 1, we also show the HQ using the next lowest available acute dose-response value.

As shown in Table 5 of this preamble, based on actual emissions, the estimated cancer MIR is 9-in-1 million, and nickel emissions from oil-fired EGUs are the major contributor to the risk. The total estimated cancer incidence from this source category is 0.04 excess cancer cases per year, or one excess case in every 25 years. Approximately 193,000 people are estimated to have cancer risks at or above 1-in-1 million from HAP emitted from the facilities in this source category. The estimated maximum chronic noncancer TOSHI for the source category is 0.2 (respiratory), which is driven by emissions of nickel and cobalt from oil-fired EGUs. No one is exposed to TOSHI levels above 1.

Based on allowable emissions, the estimated cancer MIR is 10-in-1 million, and, as before, nickel emissions from oil-fired EGUs are the major contributor to the risk. The total estimated cancer incidence from this source category is 0.1 excess cancer cases per year, or one excess case in every 10 years. Approximately 636,000 people are estimated to have cancer risks at or above 1-in-1 million from HAP emitted from the facilities in this source category. The estimated maximum chronic noncancer TOSHI for the source category is 0.4 (respiratory), driven by emissions of nickel and cobalt from oil-fired EGUs. No one is exposed to TOSHI levels above 1.

2. Acute Risk Results

Table 5 of this preamble provides the worst-case acute HQ (based on the REL) of 0.09, driven by actual emissions of arsenic. There are no facilities that have acute HQs (based on the REL or any other reference values) greater than 1. For more detailed acute risk results, refer to the risk document.

3. Multipathway Risk Screening Results

Potential multipathway health risks under a fisher and gardener scenario were identified using a three-tier screening assessment of the PB–HAP emitted by facilities in this source category, and a site-specific assessment of Hg using TRIM.FaTE for one location. Of the 322 MATS facilities modeled, 307 facilities have reported emissions of carcinogenic PB–HAP (arsenic, dioxins, and POM) that exceed a Tier 1 cancer screening value of 1, and 235 facilities have reported emissions of non-carcinogenic PB–HAP (lead, Hg, and cadmium) that exceed a Tier 1 noncancer screening value of 1. For facilities that exceeded a Tier 1 multipathway screening value of 1, we used additional facility site-specific information to perform an assessment through Tiers 2 and 3, as necessary, to determine the maximum chronic cancer and noncancer impacts for the source category. For cancer, the highest Tier 2 screening value was 200. This screening value was reduced to 50 after the plume rise stage of Tier 3. Because this screening value was much lower than 100-in-1 million, and because we expect the actual risk to be lower than the screening value (site-specific assessments typically lower estimates by an order of magnitude), we did not perform further assessment for cancer. For noncancer, the highest Tier 2 screening value was 30 (for Hg), with

four facilities having screening values greater than 20. These screening values were reduced to 9 or lower after the plume rise stage of Tier 3.

An exceedance of a screening value in any of the tiers cannot be equated with a risk value or an HQ (or HI). Rather, it represents a high-end estimate of what the risk or hazard may be. For example, a screening value of 2 for a non-carcinogen can be interpreted to mean that we are confident that the HQ would be lower than 2. Similarly, a screening value of 30 for a carcinogen means that we are confident that the risk is lower than 30-in-1 million. Our confidence comes from the conservative, or health-protective, assumptions encompassed in the screening tiers: We choose inputs from the upper end of the range of possible values for the influential parameters used in the screening tiers; and we assume that the exposed individual exhibits ingestion behavior that would lead to a high total exposure.

In evaluating the potential for multipathway effects from emissions of lead, we compared modeled maximum annual lead concentrations to the secondary NAAQS for lead (0.15 μg/m^3). The modeled maximum annual lead concentration is below the NAAQS for lead, indicating a low potential for multipathway impacts of concern due to lead.

4. Multipathway Site-Specific Assessment Results

Because the final stage of Tier 3 (time-series) was unlikely to reduce the highest Hg screening values to 1, we conducted a site-specific multipathway assessment of Hg emissions for this source category. Analysis of the facilities with the highest Tier 2 and Tier 3 screening values helped identify the location for the site-specific assessment and the facilities to model with TRIM.FaTE. We also considered the effect multiple facilities within the source category could have on common lakes in the modeling domain. The selection of the facilities for the site-specific assessment also included evaluating the number and location of lakes impacted, watershed boundaries, and land-use features around the target lakes, (*i.e.,* elevation changes, topography, rivers).

The three facilities selected are located near Underwood, North Dakota. All three facilities had Tier 2 screening values greater than or equal to 20. Two of the facilities are near each other (16 km apart). The third facility is more distant, about 20 to 30 km from the other facilities, but it was included in the analysis because it is within the 50-km modeling domain of the other facilities and because it had an elevated Tier 2 screening value. We expect that the exposure scenarios we assessed for these facilities are among the highest, if not the highest, that might be encountered for other facilities in this source category. The refined site-specific multipathway assessment, as in the screening assessments, includes some hypothetical elements, namely the hypothetical human receptor (*e.g.,* the fisher scenario which did not screen out in the screening assessments). It is important to note that although the multipathway assessment has been conducted, no data exist to verify the existence of the hypothetical human receptor. The refined multipathway assessment produced an HQ of 0.06 for Hg for the three facilities assessed. This risk assessment likely represents the maximum hazard for Hg through fish consumption for the source category and, with an HQ less than 1, is below the level of concern for exposure to emissions from these sources.

5. Environmental Risk Screening Results

As described in section V.C of this preamble, we conducted an environmental risk screening assessment for the Coal- and Oil-Fired EGU source category for the following pollutants: Arsenic, cadmium, dioxins/furans, HCl, HF, lead, Hg (methyl Hg and mercuric chloride), and POMs.

In the Tier 1 screening analysis for PB–HAP (other than lead, which was evaluated differently), POM emissions had no exceedances of any of the ecological benchmarks evaluated. Arsenic and dioxins/furans emissions had Tier 1 exceedances for surface soil benchmarks. Cadmium and methyl Hg emissions had Tier 1 exceedances for surface soil and fish benchmarks. Divalent Hg emissions had Tier 1 exceedances for sediment and surface soil benchmarks.

A Tier 2 screening analysis was performed for arsenic, cadmium, dioxins/furans, divalent Hg, and methyl Hg emissions. In the Tier 2 screening analysis, arsenic, cadmium, and dioxins/furans emissions had no exceedances of any of the ecological benchmarks evaluated. Divalent Hg emissions from two facilities exceeded the Tier 2 screen for a sediment threshold level benchmark by a maximum screening value of 2 at lake #35731. Methyl Hg emissions from the same two facilities exceeded the Tier 2 screen for a fish (avian/piscivores) no-observed-adverse-effect-level (NOAEL) (merganser) benchmark by a maximum screening value of 2 at the same lake (lake #35731). A Tier 3 screening assessment was performed to verify the existence of lake #35731. Lake #35731 was found to be located on-site and is a man-made industrial pond, and, therefore, was removed from the assessment.

Methyl Hg emissions from two facilities exceeded the Tier 2 screen for a surface soil NOAEL for avian ground insectivores (woodcock) benchmark by a maximum screening value of 2. Other surface soil benchmarks for methyl Hg, such as the NOAEL for mammalian insectivores and the threshold level for the invertebrate community, were not exceeded. Given the low Tier 2 maximum screening value of 2 for methyl Hg, and the fact that only the most protective benchmark was exceeded, a Tier 3 environmental risk screen was not conducted for methyl Hg.

For lead, we did not estimate any exceedances of the secondary lead NAAQS. For HCl and HF, the average modeled concentration around each facility (*i.e.,* the average concentration of all off-site data points in the modeling domain) did not exceed any ecological benchmark. In addition, each individual modeled concentration of HCl and HF (*i.e.,* each off-site data point in the modeling domain) was below the ecological benchmarks for all facilities.

Based on the results of the environmental risk screening analysis, we do not expect an adverse environmental effect as a result of HAP emissions from this source category.

6. Facility-Wide Risk Results

Based on facility-wide emissions, the estimated cancer MIR is 9-in-1 million, and nickel emissions from oil-fired EGUs are the major contributor to the risk. The total estimated cancer incidence from this source category is 0.04 excess cancer cases per year, or one excess case in every 25 years. Approximately 203,000 people are estimated to have cancer risks at or above 1-in-1 million from HAP emitted from the facilities in this source category. The estimated maximum chronic noncancer TOSHI for the source category is 0.2 (respiratory), driven by emissions of nickel and cobalt from oil-fired EGUs. No one is exposed to TOSHI levels above 1. These results are very similar to those based on actual emissions from the source category because there is not significant collocation of other sources with EGUs.

7. What demographic groups might benefit from this regulation?

To examine the potential for any environmental justice issues that might be associated with the source category, we performed a demographic analysis,

which is an assessment of risk to individual demographic groups of the populations living within 5 km and within 50 km of the facilities. In the analysis, we evaluated the distribution of HAP-related cancer and noncancer risk from the Coal- and Oil-Fired EGU source category across different demographic groups within the populations living near facilities.[47]

The results of the demographic analysis are summarized in Table 6 below. These results, for various demographic groups, are based on the estimated risk from actual emissions levels for the population living within 50 km of the facilities.

TABLE 6—COAL- AND OIL-FIRED EGU SOURCE CATEGORY DEMOGRAPHIC RISK ANALYSIS RESULTS

		Population with cancer risk greater than or equal to 1-in-1 million	Population with HI greater than 1
	Nationwide	**Source Category**	
Total Population	317,746,049	193,000	0
	White and Minority by Percent		
White	62	1	0
Minority	38	*99	0
	Minority by Percent		
African American	12	0	0
Native American	0.8	0	0
Hispanic or Latino (includes white and nonwhite)	18	*99	0
Other and Multiracial	7	0	0
	Income by Percent		
Below Poverty Level	14	40	0
Above Poverty Level	86	60	0
	Education by Percent		
Over 25 and without a High School Diploma	14	25	0
Over 25 and with a High School Diploma	86	75	0
	Linguistically Isolated by Percent		
Linguistically Isolated	6	*67	0

* **Note:** All the people with a cancer risk greater than or equal to 1 in 1 million reside in Puerto Rico.

The results of the Coal- and Oil-Fired EGU source category demographic analysis indicate that emissions from the source category expose approximately 193,000 people to a cancer risk at or above 1-in-1 million and no people to a chronic noncancer TOSHI greater than 1. There are only 4 facilities in the source category with cancer risk at or above 1-in-1 million, and all of them are located in Puerto Rico. Consequently, all of the percentages of the at-risk population in each demographic group associated with the Puerto Rican population are much higher than their respective nationwide percentages, and those not associated with Puerto Rico are much lower than their respective nationwide percentages.

The methodology and the results of the demographic analysis are presented in a technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Coal- and Oil-Fired EGUs,* available in the docket for this action.

B. What are our proposed decisions regarding risk acceptability, ample margin of safety, and adverse environmental effect?

1. Risk Acceptability

As noted in section V.A of this preamble, the EPA sets standards under CAA section 112(f)(2) using ''a two-step standard-setting approach, with an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on MIR of approximately 1-in-10 thousand.'' (54 FR 38045, September 14, 1989). In this proposal, the EPA estimated risks based on actual and allowable emissions from coal- and oil-fired EGU sources, and we considered these in determining acceptability.

The estimated inhalation cancer risk to the individual most exposed to actual emissions from the source category is 9-in-1 million. The estimated incidence of cancer due to inhalation exposures is 0.04 excess cancer cases per year, or one excess case every 25 years. Approximately 190,000 people face an increased cancer risk at or above 1-in-1 million due to inhalation exposure to HAP emissions from this source category. The estimated maximum chronic noncancer TOSHI from

[47] Demographic groups included in the analysis are: White, African American, Native American, other races and multiracial, Hispanic or Latino, children 17 years of age and under, adults 18 to 64 years of age, adults 65 years of age and over, adults without a high school diploma, people living below the poverty level, people living two times the poverty level, and linguistically isolated people.

inhalation exposure for this source category is 0.2. Based on allowable emissions, the estimated inhalation cancer risk to the individual most exposed is 10-in-1 million, and the estimated incidence of cancer due to inhalation exposures is 0.1 excess cancer cases per year, or one excess case every 10 years. Approximately 640,000 people face an increased cancer risk at or above 1-in-1 million due to inhalation exposure to allowable HAP emissions from this source category. The maximum chronic noncancer TOSHI from inhalation exposure is 0.4 based on allowable emissions. The screening assessment of worst-case acute inhalation impacts indicates that no facilities have actual emissions that result in an acute HQ greater than 1 for any pollutant, with an estimated worst-case maximum acute HQ of 0.09 for arsenic based on the 1-hour REL.

Potential multipathway human health risks were estimated using a three-tier screening assessment of the PB–HAP emitted by facilities in this source category. The only pollutants with elevated screening values are arsenic (cancer) and Hg (noncancer). The highest Tier 3 cancer screening value is 50, mostly driven by arsenic. The highest Tier 3 noncancer screening value is 9, for Hg. We performed a site-specific multipathway assessment which indicates that the highest Hg HQ expected from any facility in the source category is much less than 1. In evaluating the potential for multipathway effects from emissions of lead from the source category, we compared modeled maximum annual lead concentrations to the primary NAAQS for lead (0.15 $\mu g/m^3$). Results of this analysis estimate that the NAAQS for lead would not be exceeded at any off-site locations.

In determining whether risks are acceptable for this source category, the EPA considered all available health information and risk estimation uncertainty as described above. The risk results indicate that both the actual and allowable inhalation cancer risks to the individual most exposed are well below 100-in-1 million, which is the presumptive limit of acceptability. Also, the highest chronic noncancer TOSHI, and the highest acute noncancer HQ, are well below 1, indicating low likelihood of adverse noncancer effects from inhalation exposures. There are also low risks associated with ingestion, with the highest cancer risk being less than 50-in-1 million based on a conservative screening assessment, and the highest noncancer hazard being less than 1 based on a site-specific multipathway assessment.

Considering all of the health risk information and factors discussed above, including the uncertainties discussed in section V of this preamble, the EPA proposes that the risks are acceptable for this source category.

2. Ample Margin of Safety Analysis

As directed by CAA section 112(f)(2), we conducted an analysis to determine if the current emissions standards provide an ample margin of safety to protect public health. Under the ample margin of safety analysis, the EPA considers all health factors evaluated in the risk assessment and evaluates the cost and feasibility of available control technologies and other measures (including the controls, measures, and costs reviewed under the technology review) that could be applied to this source category to further reduce the risks (or potential risks) due to emissions of HAP identified in our risk assessment. In this analysis, we considered the results of the technology review, risk assessment, and other aspects of our MACT rule review to determine whether there are any cost-effective controls or other measures that would reduce emissions further to provide an ample margin of safety with respect to the risks associated with these emissions.

Our risk analysis indicated the risks from the source category are low for both cancer and noncancer health effects, and, therefore, any risk reductions from further available control options would result in minimal health benefits. Moreover, as noted in our discussion of the technology review in section VI.C of this preamble, no additional measures were identified for reducing HAP emissions from affected sources in the Coal- and Oil-Fired EGU source category. Thus, we are proposing that the current MATS requirements provide an ample margin of safety to protect public health.

3. Adverse Environmental Effects

Based on the results of our environmental risk screening assessment, we conclude that there is not an adverse environmental effect from the Coal- and Oil-Fired EGU source category. We are proposing that it is not necessary to set a more stringent standard to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.

C. What are the results and proposed decisions based on our technology review?

As described in section V.B of this preamble, our technology review focused on identifying developments in practices, processes, and control technologies that have occurred since the MATS rule was promulgated. Control technologies typically used to minimize emissions of pollutants that have numeric emission limits under the MATS rule include electrostatic precipitators and fabric filters for control of PM and non-Hg HAP metals; wet scrubbers and dry scrubbers for control of acid gases (SO_2, HCl, and HF); and activated carbon injection for control of Hg. The existing air pollution control technologies that are currently in use are well-established and provide the capture efficiencies necessary for compliance with the MATS emission limits. Based on the effectiveness and proven reliability of these control technologies, and the relatively short period of time since the promulgation of the MATS rule, no developments in practices, processes, or control technologies, nor any new technologies or practices were identified for the control of non-Hg HAP metals, acid gas HAP, or Hg. Organic HAP, including emissions of dioxins and furans, are regulated by a work practice standard that requires periodic burner tune-ups to ensure good combustion. This work practice continues to be a practical approach to ensuring that combustion equipment is maintained and optimized to run to reduce emissions of organic HAP, and continues to be expected to be more effective than establishing a numeric standard that cannot reliably be measured or monitored. Based on the effectiveness and proven reliability of the work practice standard, and the relatively short amount of time since the promulgation of the MATS rule, no developments in work practices nor any new work practices or operational procedures have been identified for this source category regarding the additional control of organic HAP. Consequently, we propose that no revisions to the MATS rule are necessary pursuant to CAA section 112(d)(6). Additional details of our technology review can be found in the memorandum, *Technology Review for the Coal- and Oil-fired EGU Source Category,* which is available in the docket for this action.

VII. Consideration of Separate Subcategory and Acid Gas Standard for Existing EGUs That Fire Eastern Bituminous Coal Refuse

The EPA is considering establishing a subcategory for emissions of acid gas HAP from existing EGUs firing eastern bituminous coal refuse. In this action, the EPA is soliciting comment on whether establishment of such a subcategory is needed (Comment C–11)

and on the acid gas HAP emission standards that would be established if we create this subcategory (Comment C–12).

A. Background

In the MATS rule proposal, the EPA proposed a single acid gas emission standard for all coal-fired power plants—using HCl as a surrogate for all acidic gas HAP. *See* 76 FR 24976, May 3, 2011. The EPA also proposed an alternative emission standard for SO_2 as a surrogate for the acid gas HAP. SO_2 is also an acidic gas—though not a HAP—and the controls used for SO_2 emission reduction are also effective for control of the acid gas HAP. Further, most, if not all, affected EGUs were already measuring and reporting SO_2 emissions as a requirement of the Acid Rain Program.

The Appalachian Region Independent Power Producers Association (ARIPPA)[48] submitted comments on the MATS proposal arguing that the characteristics of coal refuse made achievement of the standard too costly for its members and requested that the EPA create a subcategory for facilities burning coal refuse. The EPA determined that there was no basis to create such a subcategory and finalized emission standards for both HCl and SO_2 that apply to all coal-fired EGUs. *See* 77 FR 9304, February 16, 2012. ARIPPA, along with other petitioners, challenged the EPA's determination in the D.C. Circuit, and the Court upheld the final rule. *White Stallion,* 748 F.3d at 1249–50.

In addition to challenging the final rule, ARIPPA also petitioned the Agency for reconsideration, again requesting a subcategory for the acid gas standards for facilities combusting all types of coal refuse. The EPA denied the petition for reconsideration on grounds that ARIPPA had adequate opportunity to comment on the ability of coal refuse-combusting facilities to comply with the final standard. Furthermore, the EPA determined that the ARIPPA petition did not present any new information to support a change in the previous determination regarding the appropriateness of a subcategory for the acid gas HAP standard. ARIPPA subsequently sought judicial review of the denial of the petition for reconsideration. *ARIPPA* v. *EPA,* No. 15–1180 (D.C. Cir.).[49] In petitioner's briefs, ARIPPA claimed that the EPA had misunderstood its reconsideration petition and pointed to a distinction between the control of acid gas emissions from units burning anthracite refuse and those burning bituminous coal refuse. *See* Industry Pets. Br. at 35–36, *ARIPPA,* No. 15–1180 (D.C. Cir. filed Dec. 6, 2016). The EPA disagrees with the assertion that the Agency misunderstood the basis for ARIPPA's reconsideration petition as we could not find a single statement in the rulemaking record that clearly or even vaguely requested a separate acid gas HAP limit based on the distinction between anthracite refuse and bituminous coal refuse. Nonetheless, the Agency recognizes that there are differences in anthracite and bituminous coal (and, thus, between anthracite refuse and bituminous coal refuse) and that those differences can influence the acid gas HAP emissions from EGUs firing those respective fuels. Those differences may also impact the unit's ability to control those emissions.

B. Basis for Consideration of a Subcategory

1. Differences Between Anthracite Refuse and Eastern Bituminous Coal Refuse

Anthracite (or ''hard coal'') is the highest quality coal as it contains more carbon and fewer impurities—including sulfur and chlorine—than lower ranks of coal such as bituminous coal, subbituminous coal, and lignite. Anthracite is rarely used in utility power plants, but anthracite refuse is used by a small number of EGUs located in Pennsylvania. Bituminous coal is a middle rank coal between subbituminous coal and anthracite. Bituminous coal typically has a high heating value and is commonly used in electricity generation in the United States. Bituminous coal is mined in the Appalachian region (northern Alabama through Pennsylvania), the Interior Region (primarily Illinois basin), and the Western Region (a small amount of bituminous coal mined primarily in Colorado and Utah). The bituminous coal in the Interior Region tends to have the highest sulfur content, followed by bituminous coals from the Appalachian Region. Coals (of all types) mined in the Western Region tend to have the lowest sulfur and chlorine content—and the highest content of free alkali (which can act as a natural sorbent to neutralize acid gases produced in the combustion process). The EPA is aware of currently operational coal-refuse EGUs that are firing anthracite refuse (10 units), subbituminous coal refuse (1 unit), western bituminous coal refuse (1 unit), and eastern bituminous coal refuse (12 units).

The existing eastern bituminous coal refuse-fired EGUs that are currently in operation are listed below in Table 7 (excluding Seward, as discussed later). The table also lists the units' net summer capacity.

TABLE 7—EASTERN BITUMINOUS COAL REFUSE-FIRED EGUS IN CURRENT OPERATION *

ORIS Plant code	Plant	State	Capacity (MW)
10143	Colver Power Project	PA	110
10151	Grant Town Power Plant Unit 1A	WV	40
10151	Grant Town Power Plant Unit 1B	WV	40
10603	Ebensburg Power	PA	50
10641	Cambria Cogen Unit 1	PA	44
10641	Cambria Cogen Unit 2	PA	44
10743	Morgantown Energy Facility Unit 1	WV	25
10743	Morgantown Energy Facility Unit 2	WV	25
50974	Scrubgrass Generating Company LP Unit 1	PA	42
50974	Scrubgrass Generating Company LP Unit 2	PA	42

* Excluding the Seward units (as explained later).

[48] ARIPPA is a non-profit trade association comprised of independent electric power producers, environmental remediators, and service providers located in Pennsylvania and West Virginia that use coal refuse as a primary fuel to generate electricity.

[49] ARIPPA's petition for review is currently being held in abeyance. *ARIPPA* v. *EPA,* No. 15–1180, Order, No. 1672985 (April 27, 2017).

2. Control Technologies for Acid Gas HAP

All coal refuse fuels are fired in fluidized bed combustors (FBC) that use limestone injection to minimize SO_2 emissions and to increase heat transfer efficiency. This limestone injection technology may be adequate for EGUs that are firing anthracite refuse, subbituminous, and western bituminous coal refuse to meet the MATS alternative (surrogate) emission standard for SO_2 because, as previously mentioned, the anthracite coals are naturally much lower in impurities (including sulfur and chlorine) and western bituminous coals (and subbituminous coals) have lower sulfur and chlorine content and higher free alkalinity. All anthracite coal refuse-fired and western bituminous coal refuse-fired EGUs are currently emitting SO_2 at rates that are below the final MATS emission standard for acid gas HAP and the subbituminous coal refuse-fired EGU is currently emitting HCl at a rate that is below the final MATS emission standard for acid gas HAP. Therefore, there is no need to consider a subcategory that would include those units. No anthracite coal refuse-fired or western bituminous coal refuse-fired EGUs are currently reporting HCl emissions for compliance purposes; they are all opting to, instead, report the alternative standard for SO_2.

However, ARIPPA has argued that, for the eastern bituminous coal refuse-fired EGUs, limestone injection alone is not adequate to meet the final HCl or SO_2 MATS emission standards. Operators cannot simply continue to inject more limestone to the combustor as that could negatively affect the operation of the combustor with limited impact on acid gas emissions.[50] For this reason, bituminous coal refuse-fired EGUs are required to install some sort of downstream acid gas control technology in order to meet the final acid gas MATS standards. These downstream control devices could include wet FGD scrubbers, spray dryer absorbers (SDA), or dry sorbent injection (DSI) systems.

Available information suggests that wet FGD scrubbers and SDA systems would be particularly expensive retrofit control options for the small units that are currently firing eastern bituminous coal refuse. The cost effectiveness—*i.e.,* the cost per incremental ton acid gas HAP reduced—may be excessive and may be technically and practically infeasible for these units. The EPA solicits comment on whether these controls are particularly costly for these units to adopt (Comment C–13).

The eastern bituminous coal refuse-fired EGUs can also consider installation of DSI technology, which is a less costly control option. A DSI system is used to inject powdered alkaline sorbent (typically sodium- or calcium-based sorbents) into the flue gas stream. The alkaline sorbents neutralize acidic gases and the resulting solids are captured in a downstream PM control device (*e.g.,* a fabric filter). DSI has been identified as a relatively low-cost technology for control of acid gases. Some commenters to the original MATS proposal stated that DSI will not work on units firing bituminous coals. Some commenters stated that DSI is only suitable for use on low-sulfur, low-chlorine western coals. In fact, in power sector modeling using the Integrated Planning Model (IPM) to support the development of MATS, the EPA restricted the availability of the DSI option to only those units that use or switch to relatively low-sulfur coal (up to 2 lb/MMBtu SO_2).[51] Some eastern bituminous coal refuse-fired EGUs have tested DSI systems and have identified the following problems that make the technology infeasible. The use of sodium-based sorbents negatively impacts the usability, and, thus, saleability, of the captured fly ash which can be utilized in many useful ways. One beneficial use includes using fly ash in mine reclamation activities. The increased sodium loading from the injection of sodium-based sorbents can increase the leachability and mobility of metals from the fly ash.[52] Therefore, the saleability of the fly ash may be affected by the use of DSI. When both calcium-based and sodium-based sorbents were injected in testing, the emissions of Hg increased considerably (well above the final MATS emission standard for Hg). This is due to the alkaline sorbents scavenging free halides from the flue gas stream—which effectively helps to control acid gas emissions. However, the free halides are also helpful in oxidizing elemental Hg so that it can be captured in a downstream PM control device. All coal refuse-fired EGUs are emitting at levels that are below the final MATS standard for Hg (and also with the standard for filterable PM). In fact, FBC units—including those firing coal refuse—are among the best performers for Hg control.[53] Therefore, use of DSI technology for acid gas control (if feasible), would likely also require the installation of Hg-specific control technology. The EPA is soliciting comment on the technical feasibility of installing DSI, dry FGD, or other applicable control technologies at these units and whether the installation of acid gas HAP controls may create technical infeasibilities in meeting other MATS emission limits (Comment C–14).

Further, most of the existing eastern bituminous coal refuse-fired EGUs are small (most are less than 100 MW) and may be constrained by space or other configurational limitations. However, there are two eastern bituminous coal refuse-fired EGUs at the Seward Generating Station in Pennsylvania that the EPA would not consider for inclusion in a potential subcategory. The Seward units are the newest and, at 260 MW each, are by far the largest EGUs that are firing coal refuse. The Seward units were constructed with installed downstream acid gas controls that were part of the original design. The Seward facility, therefore, did not suffer from space and other configurational limitations that can affect other smaller existing eastern bituminous coal refuse-fired EGUs that are attempting to retrofit air pollution controls. Further, the Seward units were among the best performing units—with respect to HCl emissions—when the EPA developed the final MATS emission standards. And, MATS compliance reports submitted by the Seward EGUs show that the units' HCl emissions are well below the final MATS standard of 0.0020 lb/MMBtu.

The EPA has incomplete information on the emissions controls that are installed at the currently operating eastern bituminous coal refuse-fired EGUs (*i.e.,* those identified earlier in Table 7). The EPA solicits information on installed controls at those units, the types and amount of sorbents or reagents (if any) that are used, and, if present, the extent of the operation of these emissions controls (Comment C–15). The EPA also solicits comment on the cost of retrofitting DSI, dry FGD, or other applicable control technologies such that eastern bituminous coal refuse-fired EGUs are able to emit at or below the MATS standard for HCl or SO_2 (Comment C–16). To better understand the economic characteristics of the eastern bituminous coal refuse-fired EGUs, the EPA additionally solicits information on the operating costs of these units, availability and cost

[50] ''[I]ncreased limestone injection consistent with current design and operational constraints cannot further reduce HCl emissions . . . to levels consistent with the Utility MACT limit.'' *See* ARIPPA Petition for Reconsideration, p. 5, *See also* p. 10, Docket ID No. EPA–HQ–OAR–2009–0234–20175.

[51] *See* 77 FR 9412.

[52] *See* ARIPPA comments on EPA's Proposed Supplemental Finding, available at Docket ID No. EPA–HQ–OAR–2009–0234–20530.

[53] Ibid.

of their fuel supplies, and any planned retirements (Comment C–17).

C. Potential Subcategory Emission Standards

As mentioned, the EPA is considering establishing acid gas emission standards for a subcategory of existing EGUs that fire eastern bituminous coal refuse; and we are soliciting comment on the need for such a standard (Comment C–18). The EPA has conducted an analysis to determine what such a numerical emission standard would be. The analysis is summarized in a separate memorandum available in the rulemaking docket.[54] The results of that MACT floor analysis are shown below in Table 8. After the EPA establishes the MACT floor, it considers the costs and non-air quality health and environmental impacts and energy requirements to determine whether a more stringent, or ''beyond-the-floor,'' level of control should be established. The average SO_2 lb/MMBtu emission rate was determined for each currently operating eastern bituminous coal refuse-fired EGU using monthly SO_2 data available in the EPA's ECMPS for the period of January 2015 through June 2018. If the EPA were to establish a beyond-the-floor SO_2 emissions limit, it would likely be in the range of 0.60—0.70 lb/MMBtu; a limit that, on average, the currently operating eastern bituminous coal refuse-fired EGUs have achieved based on their monthly emissions data for January 2015 through June 2018. Because no HCl emissions data have been submitted for the currently operating EGUs, and SO_2 lb/MWh emissions data are available for only two of the EGUs, we could not use this same beyond-the-floor methodology to evaluate beyond-the-floor standards for SO_2 in lb/MWh or for HCl in either lb/MMBtu or lb/MWh. We, therefore, determined that the beyond-the-floor standards for those pollutants should reasonably be set based on the same percentage reduction as the SO_2 lb/MMBtu described above (*i.e.,* the 40-percent reduction in the emissions rate for SO_2 between the MACT floor value of 1.0 lb/MMBtu and the beyond-the-floor value of 0.60 lb/MMBtu). The results of the MACT floor and the beyond-the-floor analyses are shown below in Table 8.

TABLE 8—MACT FLOOR RESULTS FOR POTENTIAL EASTERN BITUMINOUS COAL REFUSE-FIRED EGUS SUBCATEGORY

Subcategory	Parameter	HCl	SO_2
	Number in MACT floor	5	5
Existing Eastern Bituminous Coal Refuse-Fired EGUs.	99% UPL of top 5	0.060 lb/MMBtu	1.0 lb/MMBtu
	(*i.e.,* MACT floor)	0.60 lb/MWh	15 lb/MWh
	Beyond-the-floor Standard	0.040 lb/MMBtu	0.6 lb/MMBtu
		0.40 lb/MWh	9 lb/MWh

The EPA solicits comment on these analyses and the methodology presented in the accompanying memorandum (Comment C–19).[55] Additionally, the EPA solicits comment on the appropriate definition of an *eastern bituminous coal refuse-fired EGU* (Comment C–20). Specifically, the EPA is seeking comment on the amount of eastern bituminous coal refuse that an EGU must fire to be an *eastern bituminous coal refuse-fired EGU* (*e.g.,* must the EGU fire 100 percent of the fuel or should it be allowed to co-fire some small amount of another fuel if needed?) (Comment C–21). The EPA also solicits comment on distinctions in smaller FBC units as compared to larger FBC units (*e.g.,* those less than 150 MW as compared to those greater than 150 MW in capacity) that fire eastern bituminous coal refuse (Comment C–22). The EPA further solicits comment on potential effects of establishing an acid gas HAP emission standard for a subcategory of small EGUs burning eastern bituminous coal refuse (Comment C–23).

VIII. Summary of Cost, Environmental, and Economic Impacts

The EPA estimates that there are 713 existing EGUs located at 323 facilities that are subject to the MATS rule. The basis of our estimate of affected EGUs and facilities are provided in the *Risk Modeling Dataset Memo,* which is available in the docket for this action. Because the EPA is not proposing any amendments to the MATS rule, there would not be any cost, environmental, or economic impacts as a result of this proposed action.

IX. Request for Comments

We solicit comments on this proposed action. In addition to general comments on this proposed action, we are also interested in additional data that may improve the risk assessments and other analyses (Comment C–24). We are specifically interested in receiving any improvements to the data used in the site-specific emissions profiles used for risk modeling (Comment C–25). Such data should include supporting documentation in sufficient detail to allow characterization of the quality and representativeness of the data or information. Section X of this preamble provides more information on submitting data. As described in section VII of this preamble, we also solicit comment on establishing a subcategory and acid gas emission standards for existing eastern bituminous coal refuse-fired EGUs.

X. Submitting Data Corrections

The site-specific emissions profiles used in the source category risk and demographic analyses (including instructions) are available for download on the RTR website at *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html.* The data files include detailed information for each HAP emissions release point for the facilities in the source category.

If you believe that the data are not representative or are inaccurate, please identify the data in question, provide your reason for concern, and provide any ''improved'' data that you have, if available. When you submit data, we request that you provide documentation of the basis for the revised values to support your suggested changes. To submit comments on the data downloaded from the RTR website, complete the following steps:

1. Within this downloaded file, enter suggested revisions to the data fields appropriate for that information.

2. Fill in the commenter information fields for each suggested revision (*i.e.,* commenter name, commenter organization, commenter email address,

[54] Memorandum titled *NESHAP for Coal- and Oil-Fired EGUs: MACT Floor Analysis and Beyond the MACT Floor Analysis for Subcategory of Existing Eastern Bituminous Coal Refuse-Fired EGUs Under Consideration,* available in Docket ID No. EPA–HQ–OAR–2018–0794.

[55] Ibid.

commenter phone number, and revision comments).

3. Gather documentation for any suggested emissions revisions (*e.g.,* performance test reports, material balance calculations).

4. Send the entire downloaded file with suggested revisions in Microsoft® Access format and all accompanying documentation to Docket ID No. EPA–HQ–OAR–2018–0794 (through the method described in the **ADDRESSES** section of this preamble).

5. If you are providing comments on a single facility or multiple facilities, you need only submit one file for all facilities. The file should contain all suggested changes for all sources at that facility (or facilities). We request that all data revision comments be submitted in the form of updated Microsoft® Excel files that are generated by the Microsoft® Access file. These files are provided on the RTR website at *https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html.*

XI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to OMB for review. Any changes made in response to OMB recommendations have been documented in the docket. The EPA does not project any potential costs or benefits associated with this action.

B. Executive Order 13771: Reducing Regulation and Controlling Regulatory Costs

This action is expected to be an Executive Order 13771 regulatory action. There are no quantified cost estimates for this proposed rule because this proposed rule is not expected to result in any changes in costs.

C. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control number 2060–0567. This action does not impose an information collection burden because the EPA is not proposing any changes to the information collection requirements.

D. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. The EPA does not project any potential costs or benefits associated with this action.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local, or tribal governments or the private sector.

F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. It would neither impose substantial direct compliance costs on tribal governments, nor preempt Tribal law. Thus, Executive Order 13175 does not apply to this action.

H. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in sections V.A and C, and sections VI.A and B of this preamble, and further documented in the risk document, available in the docket for this action.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action is not anticipated to have impacts on emissions, costs, or energy supply decisions for the affected electric utility industry.

J. National Technology Transfer and Advancement Act (NTTAA)

This action does not involve technical standards.

K. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in section VI.A of this preamble and the technical report, *Risk and Technology Review—Analysis of Demographic Factors for Populations Living Near Coal- and Oil-Fired EGUs,* available in the docket for this action.

Dated: December 27, 2018.

Andrew R. Wheeler,

Acting Administrator.

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