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[FR Doc. 2024–25392 Filed 10–30–24; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 139

[EPA–HQ–OW–2019–0482; FRL 7218–04–OW]

RIN 2040–AF92

Vessel Incidental Discharge National Standards of Performance; Correction

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule; correction.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is correcting an error found in the Vessel Incidental Discharge National Standards of Performance final rule. The final rule appeared in the **Federal Register** on October 9, 2024. This correction removes a footnote superscript number ''1'' that was included in error, as there is no accompanying footnote text.

DATES: This correction is effective on November 8, 2024.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OW–2019–0482. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI 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 form. Publicly available docket materials are available electronically through *https://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Jack Faulk, Oceans, Wetlands, and Communities Division, Office of Water (4504T), Environmental Protection Agency, 1200 Pennsylvania Avenue NW, Washington, DC 20460; telephone number: (202) 564–0768; email address: *faulk.jack@epa.gov.*

SUPPLEMENTARY INFORMATION: EPA is correcting the final rule that published in the **Federal Register** of Wednesday, October 9, 2024, (89 FR 82074); FRL–7218–01– OW to address an inadvertent error made of including a footnote superscript number ''1'' to the subpart heading ''Appendix A to Part 139—Federally-Protected Waters''.

Correction

In FR Doc. 2024–22013 appearing at 89 FR 82074 in the **Federal Register** of Wednesday, October 9, 2024, the following correction is made:

Appendix A to Part 139—Federally-Protected Waters [Corrected]

■ 1. On page 82145, in the second column, the subpart heading ''Appendix A to Part 139—Federally-Protected Waters [1]'' is corrected to read ''Appendix A to Part 139—Federally-Protected Waters''.

Bruno Pigott,

Principal Deputy Assistant Administrator.

[FR Doc. 2024–25362 Filed 10–30–24; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 262

[EPA–HQ–OLEM–2021–0609; FRL–7308–04–OLEM]

RIN 2050–AH12

Integrating e-Manifest With Hazardous Waste Exports and Other Manifest-Related Reports, PCB Manifest Amendments, and Technical Corrections; Correction

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule; correction.

SUMMARY: The Environmental Protection Agency (EPA) or (the Agency) is making four minor corrections to a final rule that appeared in the **Federal Register** on July 26, 2024. The final rule related to regulatory changes to incorporate export manifests and other manifest-related reports (*i.e.,* Discrepancy, Exception, and Unmanifested Waste Reports) into e-Manifest as well as other changes related to manifests, including for polychlorinated biphenyls under the Toxic Substances Control Act.

DATES: This final rule is effective on January 22, 2025.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2021–0609. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI 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 form. Publicly available docket materials are available electronically through *https://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Bryan Groce, Program Implementation and Information Division, Office of Resource Conservation and Recovery, Environmental Protection Agency; (202) 566–0339; email address: *groce.bryan@epa.gov* or David Graham, Program Implementation and Information Division, Office of Resource Conservation and Recovery, Environmental Protection Agency; (202) 566–2847; email address: *graham.david@epa.gov.* In addition, please refer to EPA's e-Manifest web page for further information: *www.epa.gov/e-manifest.*

SUPPLEMENTARY INFORMATION: This action corrects four minor errors to certain regulatory amendments established in the July 26, 2024, final rule (89 FR 60692) for 40 CFR 262.21, 262.42, and 262.83.

With respect to the regulatory amendments at § 262.21, the July 26 final rule established revised printing specification requirements at § 262.21(f)(6) and (7) for the new four-copy paper manifest (EPA Form 8700–22) and continuation sheet (EPA Form 8700–22A) forms. Section 262.21(f)(6) describes the revised copy distribution requirements to be printed on each copy of the new four-copy manifest (EPA-Form 8700–22) and continuation sheet (EPA Form 8700–22A). Section 262.21(f)(7) describes the revised printing specifications for printing the appropriate manifest instructions on the back of the form copies. Although, EPA finalized the manifest forms themselves by revising the wording of the distribution scheme in the bottom right margins of the forms and by moving the instructions on the reverse side of Page 2 (''Designated Facility to Generator'' copy) to the reverse side of Page 1 (top copy) of the manifest forms, EPA inadvertently did not make these conforming changes in the regulatory text at § 262.21(f)(6) and (7). This includes adding two instances of ''U.S.'' to the Page 1 (top copy) text and making changes for use of capitalization in Pages 1–4. To correct these errors, this action revises paragraph § 262.21(f)(6) so that the words indicating copy distribution exactly match the words shown at the bottom right margin of each copy of the new four-copy manifest forms. Similarly, and in addition, this action corrects § 262.21(f)(7) to match the language on the new four-copy manifest form—*i.e.,* to require that commercial printers authorized by EPA to produce the manifest forms print the instructions for designated facilities and

hazardous waste exporters on the reverse side of the top copy of the manifest forms instead of the reverse side of Page 2. This includes changing the title of the manifest instructions for the top copy of Manifest Form 8700–22 and 8700–22A from ''Instructions for Treatment, Storage, and Disposal Facilities'' to ''Instructions for Exporters or Owners and Operators of Receiving Facilities Designated on the Manifest.''

With respect to the errors in §§ 262.42 and 262.83, this action corrects errors to certain instructions in part 262 which established regulatory revisions and additions, or both, to the hazardous waste exception reporting requirements at § 262.42 and to the requirements for export shipments of hazardous waste at § 262.83. The corrections to §§ 262.42 and 262.83 are necessary to ensure that certain regulatory amendments established in the July 26 final rule under part 262 are codified accurately and correctly in title 40 of the Code of Federal Regulations.

The EPA is not providing a public comment opportunity prior to promulgation of today's technical corrections to §§ 262.21(f)(6) and (7), 262.42, and 262.83, nor is the EPA issuing a direct final rulemaking. That is because such public comment is unnecessary under 5 U.S.C. 553(b)(B) of the Administrative Procedure Act (APA). The corrections established in this action today are very minor and non-substantive technical corrections to regulations; thus, the corrections would not substantively alter the regulations established in the final rule in a way that would be of interest to the regulated community or the public. Therefore, pursuant to 5 U.S.C. 553(b)(B) of the Administrative Procedure Act (APA), the EPA finds good cause to promulgate these technical corrections without notice and comment because it would be unnecessary.

Corrections

In FR Doc. 2024–14694 appearing at 89 FR 60692 in the **Federal Register** of Friday, July 26, 2024, the following corrections are made:

§ 262.21 [Corrected]

■ 1. On page 60725, in the third column, in § 262.21:

■ a. Paragraph (f)(6)(i)) is corrected to read: ''(i) Page 1 (top copy): ''U.S. Designated Facility or U.S. Exporter to the EPA's e-Manifest System'';'';

■ b. Paragraph (f)(6)(ii) is corrected to read: ''(ii) Page 2: ''Designated Facility to Generator'';'';

■ c. Paragraph (f)(6)(iii), is corrected to read: ''(iii) Page 3: ''Transporter Copy''; and'';

■ d. Paragraph (f)(6)(iv), is corrected to read: ''(iv) Page 4 (bottom copy): ''Generator's Initial Copy''.'';

■ e. Paragraph (f)(7)(i)(C) is corrected to read: ''(C) The ''Instructions for Exporters or Owners and Operators of Receiving Facilities Designated on the Manifest'' on Top Copy (Page 1).'';

■ f. Paragraph (f)(7)(ii)(C) is corrected to read: ''(C) The ''Instructions for Exporters or Owners and Operators of Receiving Facilities Designated on the Manifest'' on Top Copy (Page 1).''.

§ 262.42 [Corrected]

■ 2. On page 60726, in the first column instruction 11.d. is corrected to read: ''d. Revising paragraph (c)(2) and adding paragraph (d).''.

§ 262.83 [Corrected]

■ 3. On page 60726, in the second column, instruction 12.a. is corrected to read: ''a. Revising the introductory text of paragraph (a)(6), paragraphs (b)(1)(i) through (iv), and (b)(3);''.

Barry N. Breen,

Principal Deputy Assistant Administrator, Office of Land and Emergency Management.

[FR Doc. 2024–25370 Filed 10–30–24; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

45 CFR Parts 1301, 1302, 1303, 1304, and 1305

[Docket No. HHS_FRDOC_0001–0957]

RIN 0970–AD01

Supporting the Head Start Workforce and Consistent Quality Programming; Announcement and Correction

AGENCY: Office of Head Start, Administration for Children and Families, U.S. Department of Health and Human Services.

ACTION: Final rule; announcement and correcting amendment.

SUMMARY: The Department of Health and Human Services is correcting a final rule that appeared in the **Federal Register** on August 21, 2024. The effective date of that final rule was listed in the preamble as the date of publication, August 21, 2024, when it should have had the required 60-day delay to comply with the Congressional Review Act. The effective date should have been October 21, 2024. Additionally, the final rule inadvertently included an incorrect citation in the requirements for family partnership services, and failed to include the compliance date for the requirements for staff benefits (August 1, 2028) in the regulatory text.

DATES: The corrections in this document are effective October 31, 2024.

FOR FURTHER INFORMATION CONTACT: Jessica Bialecki, Office of Head Start, 202–240–3901 or *Jessica.Bialecki@acf.hhs.gov.*

SUPPLEMENTARY INFORMATION: On August 21, 2024, HHS published a final rule amending 45 CFR parts 1301, 1302, 1303, 1304, and 1305. We incorrectly established the effective date as August 21, 2024. The intention was for the rule to become effective on October 21, 2024. The earliest compliance date was correctly identified as October 21, 2024, in the final rule.

List of Subjects in 45 CFR Part 1302

Compensation, Early education, Grant programs, Head Start, Mental health, Quality improvement, Social programs, Workforce.

For reasons stated in the preamble, ACF corrects 45 CFR part 1302 by making the following correcting amendments:

PART 1302—PROGRAM OPERATIONS

■ 1. The authority citation for part 1302 continues to read as follows:

Authority: 42 U.S.C. 9801 *et seq.*

■ 2. Amend § 1302.52 by revising paragraph (d)(2)(i) to read as follows:

§ 1302.52 Family partnership services.

* * * * *

(i) When the responsible HHS official grants a waiver if the program can demonstrate staff competencies at § 1302.92(b)(5); program outcomes at paragraph (b) of this section; and reasonable staff workload as described in paragraph (d)(3) of this section.

■ 3. Amend § 1302.90 by revising paragraphs (f)(1) through (4) to read as follows:

§ 1302.90 Personnel policies.

* * * * *

(f) *Staff benefits.* (1) By August 1, 2028, for each full-time staff member, defined as those working 30 or more hours per week with the Head Start program during the program year, a program must:

(i) Provide or facilitate access to high-quality affordable health care coverage;

(ii) Offer paid leave; and,

(iii) Offer access to short-term, free, or minimal cost behavioral health services.

(2) By August 1, 2028, for each part-time staff member, a program must facilitate access to high- quality, affordable health care coverage.

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 84, 261, 262, 266, 270, and 271

[EPA–HQ–OAR–2022–0606; FRL–10105–02–OAR]

RIN 2060–AV84

Phasedown of Hydrofluorocarbons: Management of Certain Hydrofluorocarbons and Substitutes Under the American Innovation and Manufacturing Act of 2020

AGENCY: Environmental Protection Agency (EPA)

ACTION: Final rule.

SUMMARY: The U.S. Environmental Protection Agency is issuing regulations to implement certain provisions of the American Innovation and Manufacturing Act of 2020. This rulemaking establishes an emissions reduction and reclamation program for the management of hydrofluorocarbons that includes requirements for leak repair and installation and use of automatic leak detection systems for certain equipment using refrigerants containing hydrofluorocarbons and certain substitutes; the servicing and/or repair of certain refrigerant-containing equipment to be done with reclaimed hydrofluorocarbons; the initial installation and servicing and/or repair of fire suppression equipment to be done with recycled hydrofluorocarbons, technician training, and recycling of hydrofluorocarbons prior to the disposal of fire suppression equipment containing hydrofluorocarbons; removal of hydrofluorocarbons from disposable cylinders before discarding them; and certain recordkeeping, reporting, and labeling requirements. In addition, EPA is establishing alternative Resource Conservation and Recovery Act standards for certain ignitable spent refrigerants being recycled for reuse.

DATES: This rule is effective December 10, 2024.

FOR FURTHER INFORMATION CONTACT: Christian Wisniewski, Stratospheric Protection Division, Office of Atmospheric Protection (Mail Code 6205A), Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460; telephone number: 202–564–0417; email address: *wisniewski.christian@epa.gov*. You may also visit EPA's website at *https://www.epa.gov/climate-hfcs-reduction* for further information.

For information related to the alternative standards for certain ignitable spent refrigerants under the Resource Conservation and Recovery Act (RCRA), please contact Tracy Atagi, Materials Recovery and Waste Management Division, Office of Resource Conservation and Recovery (5304T), Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460; telephone number: (202) 566–0511; email address: *atagi.tracy@epa.gov*.

SUPPLEMENTARY INFORMATION: Throughout this document whenever "we," "us," "the Agency," or "our" is used, we mean EPA. Acronyms that are used in this rulemaking that may be helpful include:

AHRI—Air-Conditioning, Heating, and Refrigeration Institute
ALD—Automatic Leak Detection
AIM Act—American Innovation and Manufacturing Act of 2020
APF—Air Permitting Forum
APU—Auxiliary power unit
ASHRAE—American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM—American Society for Testing and Materials
BOEM—Bureau of Ocean Energy Management
BTU/h—British thermal units per hour
CAA—Clean Air Act
CARB—California Air Resources Board
CBI—Confidential Business Information
CFC—Chlorofluorocarbon
CFR—Code of Federal Regulations
CH_4—Methane
CO_2—Carbon dioxide
CO_2e—Carbon Dioxide Equivalent
DOD—Department of Defense
DOI—Department of the Interior
DOJ—Department of Justice
DOT—Department of Transportation
EEAP—Environmental Effects Assessment Panel
EOL—End of Life
EPA—Environmental Protection Agency
ER&R—Emissions Reduction and Reclamation
EVe—Exchange Value Equivalent
FAA—Federal Aviation Administration
FEMA—Fire Equipment Manufacturers Association
F–HTFs—Fluorinated Heat Transfer Fluids
FOIA—Freedom of Information Act
FSSA—Fire Suppression Systems Association
GHG—Greenhouse gas
GWP—Global Warming Potential
HARC—Halon Alternatives Research Corporation
HCFC—Hydrochlorofluorocarbon
HCFO—Hydrochlorofluoroolefin
HEEP—HFC Emissions Estimating Program
HFC—Hydrofluorocarbon
HFO—Hydrofluoroolefin
HSWA—Hazardous and Solid Waste Amendments of 1984
HVAC—Heating, Ventilation, and Air Conditioning
HVACR—Heating, Ventilation, Air Conditioning, and Refrigeration
ICR—Information Collection Request
in-Hg—inches of Mercury
IPCC—Intergovernmental Panel on Climate Change
IPR—Industrial Process Refrigeration
LRM—Lifecycle refrigerant management
MACS—Mobile Air Climate Systems Association
$MMTCO_2e$—Million Metric Tons of Carbon Dioxide Equivalent
MMTEVe—Million Metric Tons of Exchange Value Equivalent
MVAC—Motor Vehicle Air Conditioner
NAICS—North American Industrial Classification System
NAFED—National Association of Fire Equipment Distributors
NEDA/CAP—National Environmental Development Association's Clean Air Project
NFPA—National Fire Protection Association
NODA—Notice of Data Availability
NRDC—Natural Resources Defense Council
NTTAA—National Technology Transfer and Advancement Act
OCS—Outer Continental Shelf
OCSLA—Outer Continental Shelf Lands Act
ODP—Ozone Depletion Potential
ODS—Ozone-depleting substances
OEM—Original Equipment Manufacturer
OMB—Office of Management and Budget
PII—Personally identifiable information
ppm—Parts Per Million
PRA—Paperwork Reduction Act
PTAC—Packaged terminal air conditioners
R4 Program—Refrigerant Recovery, Reclaim, and Reuse Requirements (CARB Program)
RACA—Request for Additional Consumption Allowance
RACHP—Refrigeration, Air Conditioning, and Heat Pumps
RCOP—Recycling Code of Practice
RCRA—Resource Conservation and Recovery Act
RFA—Regulatory Flexibility Act
RIA—Regulatory Impact Analysis
SAE—Society of Automotive Engineers
SC-HFC—Social Cost of Hydrofluorocarbons
SISNOSE—Significant Economic Impact on a Substantial Number of Small Entities
SNAP—Significant New Alternatives Policy
TFA—Trifluoracetic acid
TSD—Technical Support Document
UMRA—Unfunded Mandates Reform Act
VCOP—Voluntary Code of Practice
VRF—Variable Refrigerant Flow
VSQG—Very Small Quantity Generator

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I. Executive Summary

A. What is the purpose of these regulations?

The Environmental Protection Agency (EPA) is issuing regulations to implement certain provisions of the American Innovation and Manufacturing Act of 2020, codified at 42 U.S.C. 7675 (AIM Act or ''the Act''). The AIM Act authorizes EPA to address hydrofluorocarbons (HFCs) in three main ways: Phasing down HFC production and consumption through an allowance allocation program; [1] facilitating the transition to next-generation technologies by restricting use of these HFCs in the sector or subsectors in which they are used; [2] and promulgating certain regulations for purposes of maximizing reclaiming and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers. This rulemaking focuses on the third area—establishing certain regulations for HFCs and their substitutes for the purposes of maximizing reclaiming and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers.

More specifically, subsection (h) of the AIM Act, titled ''Management of Regulated Substances,'' directs EPA to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves: a regulated substance (used interchangeably with ''HFCs'' in this rulemaking), a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant.

This rulemaking establishes the Emissions Reduction and Reclamation (ER&R) Program to implement the provisions of subsection (h), including its authority to issue regulations to

[1] EPA has issued regulations establishing and codifying a framework for phasing down HFC production and consumption through an allowance allocation program, ''Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing Act'' (86 FR 55116, October 5, 2021)—referred to as the ''Allocation Framework Rule'' throughout this document. EPA finalized a separate rulemaking to update certain aspects of that regulatory framework (see final rule at 88 FR 46836, July 20, 2023)—referred to as the ''2024 Allocation Rule'' throughout this document.

[2] EPA has issued regulations addressing the framework for how EPA intends to implement its authority to restrict the use of HFCs in sectors and subsectors where they are used, as well as establishing certain restrictions on the use of HFCs in specific sectors or subsectors in which they are used, ''Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons Under the American Innovation and Manufacturing Act of 2020'' (88 FR 73098, October 24, 2023)—referred to as the ''2023 Technology Transitions Rule'' throughout this document. EPA issued an interim final rule under the Technology Transitions program further addressing a particular subsector (88 FR 88825, December 26, 2023).

control such practices, processes, or activities, particularly as related to the management, use, and reuse of HFCs and substitutes in equipment. Further, these regulations include provisions to support implementation of, compliance with, and enforcement of requirements under subsection (h) of the AIM Act.

Additionally, EPA is establishing alternative RCRA standards for certain ignitable spent refrigerants being recycled for reuse, as that term is used under RCRA.[3] These standards involve regulatory changes to 40 Code of Federal Regulations (CFR) parts 261 through 271 and are separate from the regulations under subsection (h)(1) of the AIM Act. These standards are established under a different set of statutory authorities than the ER&R regulations, and they are part of an independent and distinct regulatory regime. EPA is providing notice of the AIM Act regulations and the RCRA regulations in one **Federal Register** notice given both the RCRA regulations concerning the recovery and recycling of certain ignitable spent refrigerants and the AIM Act regulations concerning recovery and reclamation of refrigerants may be of interest to some of the same stakeholders.

B. What is the summary of the regulations finalized in this notice?

EPA is promulgating two separate and distinct sets of regulations. First, EPA is establishing an ER&R program for the management of HFCs and certain substitutes under subsection (h) of the AIM Act. The Agency is including provisions that address the purposes identified in subsection (h)(1) of the AIM Act of maximizing reclamation, minimizing the release of HFCs from equipment, and ensuring the safety of technicians and consumers. Specifically, the AIM Act regulations include requirements for:

- Leak repair of appliances that contain at least 15 pounds of a refrigerant that contains an HFC or a substitute for an HFC with a global warming potential (GWP) above 53, with specific exceptions;
- Installation and use of an automatic leak detection (ALD) system for certain new and existing appliances containing 1,500 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53;
- A reclamation standard limiting the amount of virgin HFCs that can be contained in reclaimed HFC refrigerants;
- The servicing and/or repair of existing equipment in certain refrigeration, air conditioning, and heat pumps (RACHP) subsectors to be done with reclaimed HFCs;
- The servicing, repair, disposal, or installation of fire suppression equipment that contains HFCs, with the purpose of minimizing the release of HFCs from that equipment, including requirements for the initial installation and servicing and/or repair of fire suppression equipment to be done with recycled HFCs, as well as requirements related to technician training in the fire suppression sector;
- Removal of HFCs from disposable cylinders before discarding; and
- Recordkeeping, reporting, and labeling.

Enforcement and compliance. To support compliance with these requirements, EPA is establishing labeling, reporting, and recordkeeping requirements as described in this rulemaking notice. The Agency intends to use a reporting platform the same as or similar to those used for prior AIM Act rules, and will consider making information not entitled to confidential treatment, as described in section V of this action, publicly available.

Exemptions for certain applications and other provisions. Provisions finalized in this action do not apply to two applications, mission-critical military end uses and on board aerospace fire suppression, as listed at 40 CFR 84.13(a), for a year or years for which that application receives an application-specific allowance as defined at 40 CFR 84.3. As such, the provisions established in this action include exemptions for the following applications, for a year or years for which that application receives an application-specific allowance:

- Mission-critical military end uses and
- On board aerospace fire suppression.

Amendments to the RCRA hazardous waste regulations. Second, EPA is amending a separate set of regulations promulgated under RCRA, a separate statutory authority from the AIM Act, to establish alternative standards for ignitable spent refrigerants when ''recycled for reuse,'' as the term is to be defined under RCRA. EPA is establishing that the alternative standards at 40 CFR part 266, subpart Q, under RCRA, apply to HFCs and other substitutes that are lower flammability (*i.e.,* that do not belong to flammability Class 3 as classified by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 34–2022).[4] EPA is limiting the alternative standards to lower flammability HFCs and substitutes (Class 1, 2, and 2L) because of the lower risk of fire from the collection and recycling for reuse of these refrigerants, and the greater market value of these refrigerants, which supports the conclusion that these spent refrigerants will be recycled for reuse and not stockpiled, mismanaged, or abandoned.

Other topics. Together with the proposal for this rule, EPA issued an advanced notice of proposed rulemaking (ANPRM) seeking information on approaches for establishing requirements for technician training and/or certification. As stated at proposal, EPA is not addressing technician training in this final rulemaking and accordingly is not responding to comments on the ANPRM in this final rule.

Additionally, EPA is not finalizing as part of this action under the AIM Act the proposed provisions for container tracking of HFCs that could be used in the servicing, repair, and/or installation of refrigerant-containing or fire suppression equipment. EPA is also not finalizing in this action provisions requiring the initial installation of refrigerant-containing equipment in certain subsectors in the RACHP sector to be done with reclaimed refrigerant where HFCs or a blend containing HFCs are used. The Agency intends to further consider those provisions and the comments submitted on the proposed requirements before determining how to proceed. As such, EPA need not respond to public comments on those proposed requirements as part of this action.

EPA received many comments on this rulemaking, including those that were in general support or opposition of the various provisions. Specific comments

[3] The terms ''reclaim'' and ''recycle'' have different regulatory purposes and definitions under RCRA than under the CAA and the AIM Act. Under RCRA, a material is ''reclaimed'' if it is processed to recover a usable product, or if it is regenerated. Examples are recovery of lead values from spent batteries and regeneration of spent solvents (See 40 CFR 261.1(c)(4)). Reclamation is one of the four types of ''recycling'' identified in 40 CFR 261.2(c) that can involve management of a solid waste under RCRA.

[4] ASHRAE Standard 34–2022 assigns a safety group classification for each refrigerant that consists of two alphanumeric characters (*e.g.,* A2 or B1). The capital letter indicates the toxicity class (''A'' for lower toxicity) and the numeral denotes the flammability. ASHRAE recognizes three classifications and one subclass for refrigerant flammability. The three main flammability classifications are Class 1, for refrigerants that do not propagate a flame when tested as per the ASHRAE 34 standard, ''Designation and Safety Classification of Refrigerants;'' Class 2, for refrigerants of lower flammability; and Class 3, for highly flammable refrigerants, such as the hydrocarbon refrigerants. ASHRAE recently updated the safety classification matrix to include a new flammability subclass 2L, for flammability Class 2 refrigerants that burn very slowly.

as relevant to provisions in this rulemaking are discussed in the respective sections of this rulemaking. Some comments raised issues that are beyond the scope of this rulemaking; because those comments require no response, EPA need not address them in this notice, though in many cases the Agency has noted the submission of such comments for informational purposes.

C. What is the summary of the costs and benefits?

The costs and benefits for the provisions related to managing regulated substances and their substitutes in this rule comes from the *Analysis of the Economic Impact and Benefits of the Final Rule: Management of Certain Hydrofluorocarbons and Substitutes Under Subsection (h) of the American Innovation and Manufacturing Act of 2020* technical support document (TSD) (referred to as the ''Economic Impact and Benefits TSD'' in this rule) and the *Regulatory Impact Analysis (RIA) Addendum* for this rule (referred to in this rule as the ''RIA addendum'') contained in the docket of this rule to provide the public with information on the relevant costs and benefits of this action, and to comply with executive orders. EPA notes that the costs and benefits associated with the management of regulated substances and their substitutes under the AIM Act are described and calculated separately from those associated with the amendments to the RCRA hazardous waste regulations. These analyses—as summarized later in this section—highlight the economic costs and benefits of the provisions in this rulemaking.

Given that the provisions being finalized concern the management of HFCs, and HFCs are subject to the phasedown of production and consumption under the AIM Act, the Agency relied on its previous analyses as a starting point for the assessment of costs and benefits of this rule. Specifically, the Allocation Framework Rule, ''Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing Act'' (86 FR 55116, October 5, 2021), the 2024 Allocation Rule, ''Phasedown of Hydrofluorocarbons: Allowance Allocation Methodology for 2024 and Later Years'' (88 FR 46836, July 20, 2023),[5] and the 2023 Technology Transitions Rule, ''Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons Under the American Innovation and Manufacturing Act of 2020'' (88 FR 73098, October 24, 2023) are assumed as a baseline for this rule. In this way, EPA analyzed the potential incremental impacts of the rule, attributing benefits only insofar as they are additional to those already assessed in the Allocation Framework Rule RIA, the 2024 Allocation Rule RIA Addendum, and the 2023 Technology Transitions Rule RIA Addendum (collectively referred to as ''Allocation and 2023 Technology Transitions Rules'' in this discussion).

As detailed in the RIA addendum and the Economic Impact and Benefits TSD, the number, charge sizes, leak rates, and other characteristics of potentially affected RACHP equipment were estimated using EPA's Vintaging Model.[6] These estimates served as a basis for calculating the reductions in HFC consumption and emissions from the various requirements of the final rule. As described in the RIA addendum and the Economic Impact and Benefits TSD, the leak repair and ALD system provisions finalized in this rule are assumed to result in the repair of leaking systems earlier than they otherwise would have, leading to reduced emissions of HFCs. Provisions requiring reclaimed refrigerant, requirements for the fire suppression sector, and provisions related to the handling of disposable cylinders are further estimated to result in incremental reductions in HFC emissions.

Estimated reductions in HFC releases from equipment result in climate benefits due to reduced climate forcing, which have been monetized in the RIA addendum by multiplying avoided emissions by estimates of the social cost of each HFC (collectively referred to as SC–HFC) affected by the rule. The RIA addendum includes these SC–HFC estimates and uses them in some of the analyses for the purpose of providing information to the public and to comply with executive orders. Although we utilized the SC–HFC estimates for purposes of those analyses, this action does not rely on those values or the resulting quantification of climate benefits as a record basis for this rule, and we would reach the same conclusions in absence of the social costs of HFCs. In the years 2026 through 2050, EPA estimates the rule will prevent approximately 120 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) in HFC emissions, and the present value of economic benefit of avoiding the damages associated with those emissions is estimated at $8.4 billion (discounted to 2024 dollars using a three percent discount rate).[7] The annual benefits are estimated to decrease over time due to the HFC phasedown and the transition out of the higher-GWP HFCs, lowering the average GWP of later emissions. For example, it is estimated that the leak repair and ALD system provisions will prevent approximately 5.6 $MMTCO_2e$ of HFC emissions in 2030 and 3.0 $MMTCO_2e$ in 2040.

Reducing HFC emissions due to fixing leaks earlier is also anticipated to lead to savings for some system owners and operators, as less new refrigerant needs to be purchased to replace leaked refrigerant. In 2026, it is estimated that the leak repair and ALD provisions will lead to savings of $19.5 million (2022$) based on reduced HFC refrigerant needed to maintain the equipment. We also are aware that a refrigerant-containing appliance would operate less efficiently if not properly charged and maintained, leading to increased energy costs; however, we have not quantified such savings in our analysis. EPA acknowledges that these $19.5 million in savings may not completely offset leak repair compliance costs and may not accrue uniformly to all regulated entities. Further, while these provisions have been estimated to result in savings, EPA understands that entities that may be affected by these regulations might not perform the practices, processes, or activities that would result in cost savings absent regulation. When entities are reviewing their own economic analyses, some factors may be pertinent that make new technologies or economically favorable best practices less attractive than existing practices, or some market failure may exist that acts as a barrier to businesses' adoption of

[5] This rule established the methodology for allocating HFC production and consumption allowances starting with calendar year 2024 allowances and adjusted the consumption baseline downward by less than 0.5 percent to reflect corrected data, among other changes (88 FR 46836, July 20, 2023). EPA also finalized another rulemaking in 2023 to update the regulations established in the HFC Allocation Framework Rule. That rule ''Phasedown of Hydrofluorocarbons: Adjustment to the Hydrofluorocarbon Baseline,'' amended the production baseline downward by 0.005 percent to reflect corrected data (88 FR 44220, July 12, 2023).

[6] U.S. EPA. 2023. EPA's Vintaging Model representing the Allocation Framework Rule as modified by the 2024 Allocation Rule RIA Addendum and the 2023 Technology Transitions Rule RIA Addendum. VM IO file_v4.4_02.04.16_Final TT Rule 2023 High Addition.

[7] Unless stated otherwise, costs and benefits in this section are presented in 2022 dollars.

the most profitable course.[8] For example, market failures may exist where there is imperfect information or split incentives, such as decision-makers not knowing the percentage of energy use associated with refrigeration or the costs of replacing refrigerant lost from leaking appliances.

The compliance costs of the rule include recordkeeping and reporting costs, the costs of purchasing and operating ALD systems, costs of required inspections, the cost of repairing leaks earlier than would have been necessary without the provisions, the costs associated with using reclaimed HFCs in certain RACHP subsectors for the servicing of existing equipment (vis a vis virgin manufactured HFCs), the costs associated with minimizing releases of HFCs from fire suppression equipment (including using recycled HFCs in the initial and servicing and/or repair of fire suppression equipment), and the cost of disposable cylinder management requirements. In the years 2026 through 2050, these provisions would result in compliance costs (inclusive of refrigerant savings) with a present value estimated at $1.5 billion (in 2022 dollars discounted to 2024) at a two percent discount rate, $1.3 billion at a three percent discount rate, or $0.9 billion at a seven percent discount rate.

Taking into account both benefits and compliance costs over the 2026 through 2050 time period, it is estimated that the rule results in present value net benefit (climate benefits, as monetized by application of SC-HFCs, discounted at three percent, minus compliance costs) of $6.9 billion (with compliance costs discounted at two percent) to $7.5 billion (with compliance costs discounted at seven percent).

As detailed in the RIA addendum and the Economic Impact and Benefits TSD, these values represent an estimate of potential incremental benefits and assume that industry would comply with previous AIM Act regulations as outlined in the 2023 Technology Transitions RIA Addendum [9] but would not undertake certain improvements to leak repair and refrigerant recovery practices in the absence of this rulemaking that were not required by those regulations. Since these assumptions are ultimately uncertain, in the RIA addendum and the Economic Impact and Benefits TSD, EPA has also provided estimates under an additional scenario in which leak repair and recovery improvements do occur in the baseline, thus resulting in lower incremental benefits. The assumptions in this alternative scenario translate into reduced estimates of the incremental effect of the provisions of this final rule since additional impacts are only quantified insofar as they go beyond baseline assumptions of existing policy and industry practice.

Some of the information regarding projected impacts of certain aspects of the action was considered by EPA as it finalized this rulemaking. To the extent that EPA has considered such information, it is compiled in the Economic Impact and Benefits TSD, which is in the docket for this rulemaking. While EPA has included estimates of the costs and benefits of this rulemaking in the RIA addendum to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, the analysis in the RIA addendum does not form a basis or rationale for any of the provisions EPA is promulgating in this rulemaking.

Further, as explained previously in this section, although EPA is using the SC-HFCs for purposes of some of the analysis in the RIA addendum, this action does not rely on those SC-HFC estimates as a record basis for the Agency's action. EPA would reach the conclusions in this rule even in the absence of the SC-HFCs. Additional information on these analyses can be found in section VI of this preamble, as well as the RIA addendum, which is in the docket for this rulemaking.

II. General information

A. Do these regulations apply to me?

You may be potentially affected by the regulations established in this final rule if you own, operate, service, repair, recycle, dispose, or install equipment containing HFCs or their substitutes, as well as if you recover, recycle, or reclaim HFCs or their substitutes. You may also be potentially affected if you manufacture or sell equipment containing HFCs or their substitutes. Potentially affected categories, by North American Industrial Classification System (NAICS) code, are included in Table 1.

TABLE 1—NAICS CLASSIFICATION OF POTENTIALLY AFFECTED ENTITIES

NAICS Code	NAICS industry description
236118	Residential Remodelers.
236220	Commercial and Institutional Building Construction.
238220	Plumbing, Heating, and Air-Conditioning Contractors.
238990	All Other Specialty Trade Contractors.
311812	Commercial Bakeries.
321999	All Other Miscellaneous Wood Product Manufacturing.
322299	All Other Converted Paper Product Manufacturing.
324191	Petroleum Lubricating Oil and Grease Manufacturing.
324199	All Other Petroleum and Coal Products Manufacturing.
325199	All Other Basic Organic Chemical Manufacturing.
325211	Plastics Material and Resin Manufacturing.
325412	Pharmaceutical Preparation Manufacturing.
325414	Biological Product (except Diagnostic) Manufacturing.
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing.
326299	All Other Rubber Product Manufacturing.
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing.
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers.
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing.
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.
333511	Industrial Mold Manufacturing.

[8] Klemick, Heather & Kopits, Elizabeth & Wolverton, Ann. "Potential Barriers to Improving Energy Efficiency in Commercial Buildings: The Case of Supermarket Refrigeration." Journal of Benefit-Cost Analysis. 8, 2017, pp. 1–31.

[9] In the 2023 Technology Transitions RIA Addendum, EPA analyzed a "base case" and a "high additionality" scenario. The former is used as the baseline to analyze the base case scenario for this rule. See the RIA addendum and Economic Impact and Benefits TSD for additional details.

TABLE 1—NAICS CLASSIFICATION OF POTENTIALLY AFFECTED ENTITIES—Continued

NAICS Code	NAICS industry description
333912	Air and Gas Compressor Manufacturing.
333999	All Other Miscellaneous General Purpose Machinery Manufacturing.
334413	Semiconductor and Related Device Manufacturing.
334419	Other Electronic Component Manufacturing.
334516	Analytical Laboratory Instrument Manufacturing.
335220	Major Household Appliance Manufacturing.
336120	Heavy-Duty Truck Manufacturing.
336212	Truck Trailer Manufacturing.
336214	Travel Trailer and Camper Manufacturing.
3363	Motor Vehicle Parts Manufacturing.
3364	Aerospace Product and Parts Manufacturing.
336411	Aircraft Manufacturing.
336611	Ship Building and Repairing.
336612	Boat Building.
339112	Surgical and Medical Instrument Manufacturing.
339113	Surgical Appliance and Supplies Manufacturing.
339999	All Other Miscellaneous Manufacturing.
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers.
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers.
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers.
423620	Household Appliances, Electric Housewares, and Consumer Electronics Merchant Wholesalers.
423690	Other Electronic Parts and Equipment Merchant Wholesalers.
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers.
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers.
423740	Refrigeration Equipment and Supplies Merchant Wholesalers.
423830	Industrial Machinery and Equipment Merchant Wholesalers.
423840	Industrial Supplies Merchant Wholesalers.
423850	Service Establishment Equipment and Supplies Merchant Wholesalers.
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers.
423990	Other Miscellaneous Durable Goods Merchant Wholesalers.
424690	Other Chemical and Allied Products Merchant Wholesalers.
424820	Wine and Distilled Alcoholic Beverage Merchant Wholesalers.
441310	Automotive Parts and Accessories Stores.
443141	Household Appliance Stores.
444190	Other Building Material Dealers.
445110	Supermarkets and Other Grocery (except Convenience) Stores.
445131	Convenience Retailers.
445298	All Other Specialty Food Retailers.
446191	Food (Health) Supplement Stores.
449210	Electronics and Appliance Retailers.
452311	Warehouse Clubs and Supercenters.
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores).
45711	Gasoline Stations With Convenience Stores.
481111	Scheduled Passenger Air Transportation.
488510	Freight Transportation Arrangement.
493110	General Warehousing and Storage.
531120	Lessors of Nonresidential Buildings (except Mini warehouses).
541330	Engineering Services.
541380	Testing Laboratories.
541512	Computer Systems Design Services.
541519	Other Computer Related Services.
541620	Environmental Consulting Services.
561210	Facilities Support Services.
561910	Packaging and Labeling Services.
561990	All Other Support Services.
562111	Solid Waste Collection.
562211	Hazardous Waste Treatment and Disposal.
562920	Materials Recovery Facilities.
621498	All Other Outpatient Care Centers.
621999	All Other Miscellaneous Ambulatory Health Care Services.
72111	Hotels (Except Casino Hotels) and Motels.
72112	Casino Hotels.
72241	Drinking Places (Alcoholic Beverages).
722511	Full-service Restaurants.
722513	Limited-service Restaurants.
722514	Cafeterias, Grill Buffets, and Buffets.
722515	Snack and Nonalcoholic Beverage Bars.
81119	Other Automotive Repair and Maintenance.
811219	Other Electronic and Precision Equipment Repair and Maintenance.
811412	Appliance Repair and Maintenance.
922160	Fire Protection.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this rulemaking. This table lists the types of entities that EPA expects could potentially be regulated by this rulemaking. Other types of entities not listed in the table could also be regulated. To determine whether your entity may be regulated by this rulemaking, you should carefully examine the regulatory text at the end of this document. If you have questions regarding the applicability of these regulations to a particular entity, consult the people listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What is EPA's authority for these regulations?

On December 27, 2020, the AIM Act was enacted as section 103 in Division S, Innovation for the Environment, of the Consolidated Appropriations Act, 2021 (42 U.S.C. 7675). In subsection (k)(1)(A), the AIM Act provides EPA with the authority to promulgate necessary regulations to carry out EPA's functions under the Act, including its obligations to ensure that the Act's requirements are satisfied (42 U.S.C. 7675(k)(1)(A)). Subsection (k)(1)(C) of the Act also provides that Clean Air Act (CAA) sections 113, 114, 304, and 307 apply to the AIM Act and any regulations EPA promulgates under the AIM Act as though the AIM Act were part of Title VI of the CAA (42 U.S.C. 7675(k)(1)(C)). Accordingly, the promulgation of these regulations under the AIM Act is subject to CAA section 307(d) (see 42 U.S.C. 7607(d)(1)(I)) (CAA section 307(d) applies to ''promulgation or revision of regulations under subchapter VI of this chapter ((relating to stratosphere and ozone protection))'').

The AIM Act authorizes EPA to address HFCs in three main ways: phasing down HFC production and consumption through an allowance allocation program; facilitating the transition to next-generation technologies by restricting use of these HFCs in the sector or subsectors in which they are used; and promulgating certain regulations for purposes of maximizing reclaiming and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers. This rulemaking focuses on the third area—establishing certain regulations for HFCs and their substitutes for the purposes of maximizing reclaiming [10] and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers.

The identification of regulated substances is addressed under subsection (c) of the Act. The Act lists 18 saturated HFCs, and by reference any of their isomers not so listed, which are covered by the statute's provisions and are referred to as ''regulated substances'' [11] under the Act (42 U.S.C. 7675(c)(1)). Congress also assigned an ''exchange value'' [12] [13] to each regulated substance. EPA is also authorized to designate additional substances as regulated substances if they meet certain criteria; for example, to be listed, the substance must be a saturated HFC that has an exchange value greater than 53 (which is also the lowest exchange value for a regulated substance listed in subsection (c)(1) of the Act) (42 U.S.C. 7675(c)(3)).

The regulated substances addressed in this rulemaking may be used neat (*i.e.,* as a single component substance) or in a blend with other substances, which may include other regulated substances and/or substitutes for regulated substances. The requirements included in this rulemaking for regulated substances apply regardless of whether the regulated substance is used neat or in a blend. In taking this approach, EPA is not concluding that a blend that uses one or more regulated substances is itself a regulated substance. Rather, the Agency is intending to regulate the regulated substance(s) used within a ''blend of substances'' (42 U.S.C. 7675(c)(3)(B)(ii)), such that the requirements applicable to equipment that uses regulated substances also affect equipment that uses regulated substances in blends. This is consistent with approaches that the Agency has taken under the Allocation Framework Rule (86 FR 55116, October 5, 2021), the 2024 Allocation Rule (88 FR 46836, July 20, 2023), and the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023).[14] Furthermore, subsection (h)(1) requires EPA to promulgate regulations addressing certain practices, processes, or activities involving, among other things, a regulated substance or a substitute for a regulated substance (42 U.S.C. 7675(h)(1)(A)–(B)). Consistent with those provisions, regulatory requirements under subsection (h) may also apply with respect to substitutes for regulated substances, regardless of whether the substitute is used neat or in a blend. In taking this approach for substitutes for a regulated substance, EPA is not concluding that a blend that uses one or more such substitutes that are so regulated is itself a regulated substance under subsection (c) of the Act, nor is EPA designating the substitute a regulated substance under subsection (c) of the Act. Rather, such substitutes are simply addressed, as appropriate, under EPA's authority to promulgate regulations under subsection (h) for certain practices, processes, or activities that involve a substitute for a regulated substance.

Subsection (h) of the AIM Act is titled ''Management of Regulated Substances.'' For purposes of maximizing reclaiming and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers, subsection (h)(1) directs EPA to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance, a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant (42 U.S.C. 7675(h)(1)). Subsection (h)(1) further provides that this includes requiring, where appropriate, that any such servicing, repair, disposal, or installation be performed by a trained technician meeting minimum standards, as determined by EPA. The phrase ''where appropriate'' in subsection (h)(1) provides EPA discretion to reasonably determine how the regulations under

[10] For purposes of this provision, EPA views ''reclaim,'' ''reclaiming,'' and ''reclamation'' as similar terms and when used as nouns uses them interchangeably in this ER&R action.

[11] As noted previously in this action, ''regulated substance'' and ''HFC'' are used interchangeably in this ER&R action.

[12] EPA has determined that the exchange values included in subsection (c) of the AIM Act are identical to the GWPs included in the Intergovernmental Panel on Climate Change (IPCC) (2007). EPA uses the terms ''global warming potential,'' ''GWP,'' and ''exchange value'' interchangeably in this rulemaking.

[13] IPCC (2007): Solomon, S., D. Qin, M. Manning, R.B. Alley, T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, J.M. Gregory, G.C. Hegerl, M. Heimann, B. Hewitson, B.J. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T.F. Stocker, P. Whetton, R.A. Wood and D. Wratt, 2007: Technical Summary. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA *https://www.ipcc.ch/report/ar4/wg1*. The IPCC's Fourth Assessment Report is also referred to as IPCC AR4.

[14] In affirming this aspect of the Allocation Framework Rule, the D.C. Circuit held that ''EPA has statutory authority to regulate HFCs within blends . . . because an HFC within a blend remains a regulated HFC under the Act.'' *Heating, Air Conditioning & Refrigeration Distributors Int'l* v. *EPA,* 71 F.4th 59, 64 (D.C. Cir. 2023).

subsection (h)(1) will apply because ''where appropriate'' clearly leaves EPA flexibility to determine how to regulate in the context of subsection (h). In exercising its discretion under this provision, EPA has taken a number of considerations into account, such as: the text of subsection (h)(1) itself, including the statutory purposes identified in that provision; the anticipated effectiveness of the requirements under consideration in serving those purposes; the intent of subsection (h), considering the overall context and structure of the AIM Act; and information and insight drawn from EPA's past experience with the same or similar practices, processes, or activities, as well as sectors, subsectors, and markets, gained from implementing other programs, including under other provisions of the AIM Act and the CAA.

Under subsection (h)(2)(A) of the AIM Act, the Agency ''shall consider the use of authority available . . . under this section to increase opportunities for the reclaiming of regulated substances used as refrigerants.'' Subsection (h)(2)(B) of the Act further provides that a ''regulated substance used as a refrigerant that is recovered shall be reclaimed before the regulated substance is sold or transferred to a new owner, except where the recovered regulated substance is sold or transferred to a new owner solely for the purposes of being reclaimed or destroyed.''

Further, subsection (h)(3) provides that in promulgating regulations to carry out subsection (h), EPA may coordinate those regulations with ''any other regulations promulgated by the [EPA] that involve—(A) the same or a similar practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment; or (B) reclaiming.'' The statute's use of ''may'' conveys the Agency discretion to choose whether to coordinate regulations under subsection (h) with other Agency regulations, as well as determine the circumstances in which it is appropriate to undertake such coordination. Congress did not define the term ''coordinate'' in the AIM Act. EPA interprets the term, as used in this context, as encompassing a variety of forms of coordination that could potentially be used for the specified types of regulatory provisions and interprets (h)(3) as conveying discretion to EPA to select the form or forms of coordination that are appropriate for the particular circumstances and regulatory provisions under consideration in a given action. This action under subsection (h) of the AIM Act describes whether and where EPA is coordinating with regulations that involve the same or similar practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment or reclaiming, and the Agency's rationale on the appropriateness of coordinating with these regulations. For example, coordination could include establishing parallel requirements under subsection (h), where appropriate, as in another regulatory regime so that a similar practice, process, or activity in similar equipment is held to similar standards under both regimes. It could also include deciding not to establish requirements under subsection (h) in certain situations, such as when an existing requirement already applies to a similar practice, process, or activity under another set of regulations that EPA views as adequate to also address the purposes of subsection (h). Coordination could also mean coordinating rulemaking schedules or timing for certain requirements under subsection (h) that cover a similar practice, process, or activity as covered in a previous regulation and would meet the purposes of subsection (h). Finally, coordination may also mean coordinating the requirements under subsection (h) with revisions to regulations under other statutory authorities that address related practices, processes, or activities, with the goal of developing independent regulatory regimes that operate well together to achieve their stated goals.

Subsection (h)(4) expressly states that any rulemaking under subsection (h) shall not apply to a regulated substance or a substitute for a regulated substance that is contained in a foam. Thus, the requirements in this rulemaking do not apply to regulated substances or substitutes for regulated substances when those substances are contained in foams.

Finally, subsection (h)(5) provides that, subject to availability of appropriations, EPA shall establish a grant program to award small business grants for the purchase of new specialized equipment for the recycling, recovery, or reclamation of a substitute for a regulated substance, including the purchase of approved refrigerant recycling equipment for recycling, recovery, or reclamation in the service or repair of motor vehicle air conditioner (MVAC) systems. Funds have not been appropriated for this grant program. The establishment of this program is outside the scope of this rulemaking.

Through this rulemaking, EPA is establishing an ER&R program that includes requirements for leak repair for certain equipment containing a refrigerant that contains an HFC or certain substitutes for HFCs; installation and use of ALD systems for certain equipment; the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors; requirements for the servicing, repair, disposal, or installation of fire suppression equipment that contains HFCs to be done with recycled HFCs, with the purpose of minimizing the release of HFCs from that equipment, as well as requirements related to technician training in the fire suppression sector; and recovery of HFCs from disposable cylinders before discarding. EPA is also establishing recordkeeping, reporting, and/or labeling requirements pursuant to these provisions.

Under subsection (h)(1), EPA is directed to promulgate certain regulations for ''purposes of maximizing the reclaiming and minimizing the release of a regulated substance from equipment and ensuring the safety of technicians and consumers.'' Subsection (h) further specifies that those regulations are to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance, a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant. Together, the provisions, as summarized here and explained in greater detail in the relevant sections of this rulemaking, are designed to further those three purposes described in subsection (h)(1); *i.e.,* (1) maximizing reclaiming, (2) minimizing the release of regulated substances from equipment, and (3) ensuring the safety of technicians and consumers, consistent with the scope of regulatory authority under that provision. As EPA interprets the statutory text, the suite of regulations established under subsection (h)(1) of the Act, taken together, are to focus on serving these purposes, though the individual regulatory provisions under subsection (h)(1) need not each connect to all three purposes. This interpretation is integral to establishing an effective regulatory program, as some regulatory provisions that might be considered under (h)(1) may be highly efficacious at addressing one of the regulatory purposes but not address the other two, or alternatively, may be important to support the functioning of the regulatory program as a whole, but not be focused on any of the specific purposes. Accordingly, this understanding of the statutory text will support EPA's ability to develop

regulations that work together to help achieve the statutory purposes.

Together, the provisions in this action serve the purposes described in (h)(1), with certain provisions more geared towards one or two of the purposes identified in subsection (h)(1). For example, the provisions related to leak repair in this action are directed at the purpose of minimizing the release of a regulated substance from equipment, but also help serve the purpose of maximizing the reclaiming of a regulated substance. Those provisions set requirements for when and how equipment must be serviced and leaks in equipment must be repaired. Taking these actions will minimize the release of regulated substances through such leaks, as the sooner a leak is found and repaired, the less HFC will be released from that leak. Further, by limiting the amount of regulated substances released from leaks in equipment, the opportunity to recover and subsequently reclaim these regulated substances increases. Thus, the provisions related to leak repair also help serve the purpose of maximizing the reclaiming of regulated substances.

Another example is the provisions for the installation and use of ALD systems, which, similar to the leak repair provision, help address the purposes articulated in subsection (h)(1). In general, ALD systems will alert an owner or operator to leaks in refrigerant-containing appliances well before any measurable decrease in the level of performance of the equipment. Identifying and repairing leaks sooner as a result of detecting the leak with an ALD system will further limit the amount of regulated substance released from the leak and maintain more of the regulated substance within the equipment, where it will be available for eventual recovery and reclamation.

In addition to establishing requirements for the management of HFCs and substitutes, this action includes provisions designed to support enforcement and compliance, including recordkeeping and reporting. As stated earlier in this section, subsection (k)(1)(C) of the AIM Act states that CAA section 114 applies to the AIM Act and rules promulgated under it as if the AIM Act were included in CAA Title VI. Thus, CAA section 114, which provides authority to the EPA Administrator to require recordkeeping and reporting in carrying out provisions of the CAA, also applies to and supports this rulemaking. These provisions and ones like them are integral to establishing an effective regulatory program, and thus are important to the overall efficacy of the HFC management program at achieving the purposes articulated in subsection (h)(1), even if they may be less directly connected to those purposes if viewed in isolation.

EPA is also establishing alternative RCRA standards for ignitable spent refrigerants being recycled for reuse. These standards are not part of the regulations under subsection (h)(1) of the AIM Act but rather involve revisions to independent regulatory provisions, under a separate and distinct statutory authority. More specifically, the action under RCRA involves regulatory changes to 40 CFR parts 261 through 271, and those changes are made under the authority of sections 2002, 3001, 3002, 3003, 3004, 3006, and 3010 of the Solid Waste Disposal Act of 1965 (SWDA), as amended by the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA). This statute is commonly referred to as ''RCRA.''

III. Background

A. What are HFCs?

HFCs are anthropogenic [15] fluorinated chemicals that have no known natural sources. HFCs are used in a variety of applications such as refrigeration and air conditioning, foam- blowing agents, solvents, aerosols, and fire suppression. HFCs are potent greenhouse gases (GHGs) with 100-year GWPs (a measure of the relative climatic impact of a GHG) that can be hundreds to thousands of times more potent than carbon dioxide (CO_2).

HFC use and emissions [16] have been growing worldwide due to the global phaseout of ozone-depleting substances (ODS) under the *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol) and the increasing use of refrigeration and air conditioning equipment globally. HFC emissions had previously been projected to increase substantially over the next several decades. In 2016, in Kigali, Rwanda, countries agreed to adopt an amendment to the Montreal Protocol, known as the Kigali Amendment, which provides for a global phasedown of the production and consumption of HFCs. The United States ratified the Kigali Amendment on October 31, 2022. Global adherence to the Kigali Amendment will substantially reduce future emissions, leading to a peaking of HFC emissions before 2040.[17] [18] For additional context, EPA further notes that the G7 Climate, Energy, and Environment ministers met in April 2024 and issued a joint declaration, which included statements recognizing the importance of reducing non-CO_2 carbon emissions and other climate pollutants, including HFCs, and supporting robust implementation of the Kigali Amendment.[19] The joint declaration [20] also included the commitment of the relevant governments to, among other things, take concrete actions to reduce non-CO_2 emissions and promote the proper choice of refrigerants as well as the management of HFCs throughout their lifecycle including through leak prevention and end-of-life management of refrigerants.

Atmospheric observations of most currently measured HFCs confirm their abundances are increasing at accelerating rates. Total emissions of HFCs increased by 23 percent from 2012 to 2016 [21] and a further 19 percent from 2016 to 2020. The four most abundant HFCs in the atmosphere, in GWP-weighted terms, are HFC–134a, HFC–125, HFC–23, and HFC–143a.[22]

HFCs excluding HFC–23 accounted for a radiative forcing [23] of 0.025 W/m ^{2}

[15] While the overwhelming majority of HFC production is intentional, EPA is aware that HFC–23 can be a byproduct associated with the production of other chemicals, including but not limited to hydrochlorofluorocarbon (HCFC)–22.

[16] World Meteorological Organization (WMO), Scientific Assessment of Ozone Depletion: 2022, GAW Report No. 278, 509 pp., WMO, Geneva, Switzerland, 2022. Available at: *https://ozone.unep.org/system/files/documents/Scientific-Assessment-of-Ozone-Depletion-2022.pdf.*

[17] Ibid.

[18] A recent study estimated that global compliance with the Kigali Amendment is expected to lower 2050 annual emissions by 3.0–4.4 $MMTCO_2e$. Guus J.M. Velders et al. Projections of hydrofluorocarbon (HFC) emissions and the resulting global warming based on recent trends in observed abundances and current policies. Atmos. Chem. Phys., 22, 6087–6101, 2022. Available at: *https://doi.org/10.5194/acp-22-6087-2022.*

[19] The Ministerial meeting on Climate, Energy and Environment ends with the adoption of a joint communiqué, April 30, 2024, available: *https://www.g7italy.it/en/the-ministerial-meeting-on-climate-energy-and-environment-ends-with-the-adoption-of-a-joint-communique/.*

[20] Climate, Energy and Environment Ministers' Meeting Communiqué, April 29–30, 2024, available: *https://www.g7italy.it/wp-content/uploads/G7-Climate-Energy-Environment-Ministerial-Communique_Final.pdf.*

[21] World Meteorological Organization (WMO), Scientific Assessment of Ozone Depletion: 2018, World Meteorological Organization, Global Ozone Research and Monitoring Project—Report No. 58, 588 pp., Geneva, Switzerland, 2018. Available at: *https://ozone.unep.org/sites/default/files/2019-05/SAP-2018-Assessment-report.pdf.*

[22] WMO, 2022.

[23] Radiative forcing is expressed in units of watts per square meter (W/m^2) and is defined by the IPCC as ''a measure of the influence a factor has in altering the balance of incoming and outgoing energy in the Earth-atmosphere system and is an index of the importance of the factor as a potential climate change mechanism.'' IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel

in 2016, rising to 0.037 W/m^2 in 2020. This is an increase of nearly a third in total HFC forcing relative to 2016. This radiative forcing was projected to increase by an order of magnitude to 0.25 W/m^2 by 2050.[24] If the Kigali Amendment is fully implemented, it is expected to reduce the future radiative forcing due to HFCs (excluding HFC–23) to 0.13 W/m^2 in 2050, which is a reduction of about 50 percent compared with the radiative forcing projected in the business-as-usual scenario of uncontrolled HFCs.[25]

There are hundreds of possible HFC compounds. The 18 HFCs listed as regulated substances by the AIM Act are some of the most commonly used HFCs (neat and in blends) and have high impacts as measured by the quantity of each substance emitted, multiplied by their respective GWPs. These 18 HFCs are all saturated, meaning they have only single bonds between their atoms, and therefore have longer atmospheric lifetimes.

In the United States, HFCs are used primarily in refrigeration and air conditioning equipment in homes, commercial buildings, and industrial operations (approximately 75 percent of total HFC use in 2018) and in air conditioning in vehicles and refrigerated transport (approximately 8 percent). Smaller amounts are used in foam products (approximately 11 percent), aerosols (approximately 4 percent), fire protection systems (approximately 1 percent), and solvents (approximately 1 percent).[26]

on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. *https://www.ipcc.ch/report/ar4/syr.*

[24] Guus J.M. Velders, David W. Fahey, John S. Daniel, Stephen O. Andersen, Mack McFarland, Future atmospheric abundances and climate forcings from scenarios of global and regional hydrofluorocarbon (HFCs) emissions, Atmospheric Environment, doi:10.1016/j.atmosenv.2015.10.071, 2015.

[25] Ibid.

[26] Calculations based on EPA's Vintaging Model, which estimates the annual chemical emissions from industry sectors that historically used ODS, including refrigeration and air conditioning, foam blowing agents, solvents, aerosols, and fire suppression. The model uses information on the market size and growth for each end-use, as well as a history and projections of the market transition from ODS to substitutes. The model tracks emissions of annual "vintages" of new equipment that enter into operation by incorporating information on estimates of the quantity of equipment or products sold, serviced, and retired or converted each year, and the quantity of the compound required to manufacture, charge, and/or maintain the equipment. Additional information on these estimates is available in U.S. EPA, April 2016. EPA Report EPA–430–R–16–002. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014. Available at: *https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2014.*

EPA estimated in the Allocation Framework Rule (86 FR 55116, October 5, 2021) as updated under the 2024 Allocation Rule (88 FR 46836, July 20, 2023), that phasing down HFC production and consumption according to the schedule provided in the AIM Act will avoid cumulative consumption of 3,156 million metric tons of exchange value equivalent (MMTEVe) of HFCs in the United States for the years 2022 through 2036. That estimate included both consumption as defined in 40 CFR 84.3—*i.e.,* with respect to a regulated substance, bulk production plus bulk imports minus bulk exports—and, although not requiring AIM Act allowances, the amount in imported products containing a regulated substance, less the amount in exported products containing a regulated substance. Annual avoided consumption was estimated at 42 MMTCO$_2$e in 2022 and 282 MMTCO$_2$e in 2036. In order to calculate the climate benefits associated with consumption abatement, the consumption changes were expressed in terms of emissions reductions. EPA estimated that for the years 2022 through 2050, the HFC phasedown will avoid emissions of 4,560 MMTCO$_2$e of HFCs in the United States. The annual avoided emissions are estimated at 22 MMTCO$_2$e in the year 2022 and 171 MMTCO$_2$e in 2036. More information regarding these estimates is provided in the Allocation Framework Rule RIA and the 2024 Allocation Rule RIA Addendum, which can be found in the docket for this rulemaking.

The Agency calculated incremental avoided consumption and emissions under the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023). HFC consumption reductions beyond those from the HFC phasedown as stipulated in the previous paragraph ranged from 720 to 1,113 MMTCO$_2$e for the years 2025 through 2050. EPA also estimated that the 2023 Technology Transitions Rule will achieve an additional 83 to 876 MMTCO$_2$e of avoided emissions over these years, 2025 through 2050. The 2023 Technology Transitions Rule RIA Addendum, as well as the TSD, *Costs and Environmental Impacts,* are available in the docket for this rulemaking.

B. How do HFCs affect public health and welfare?

Elevated concentrations of GHGs including HFCs are and have been warming the planet, leading to changes in the Earth's climate including changes in the frequency and intensity of heat waves, precipitation, and extreme weather events; rising seas; and retreating snow and ice. The changes taking place in the atmosphere as a result of the well-documented buildup of GHGs due to human activities are changing the climate at a pace and scale that threatens human health, society, and the natural environment. This section provides some scientific background on climate change to offer additional context for this rulemaking and help the public understand the environmental impacts of GHGs, such as HFCs. Extensive additional information on climate change is available in the scientific assessments and Agency documents that are briefly described in this section, as well as in the technical and scientific information supporting them.

One of those documents is EPA's 2009 Endangerment and Cause or Contribute Findings for Greenhouse Gases under CAA section 202(a) (74 FR 66496, December 15, 2009).[27] In the 2009 Endangerment Finding, the Administrator found under CAA section 202(a) that elevated atmospheric concentrations of six key, well-mixed GHGs—CO_2, methane (CH_4), nitrous oxide (N_2O), HFCs, perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—"may reasonably be anticipated to endanger the public health and welfare of current and future generations" (74 FR 66523, December 15, 2009), and subsequent science and observed changes have confirmed and strengthened the understanding and concerns regarding the climate risks considered in the Finding. The 2009 Endangerment Finding, together with the extensive scientific and technical evidence in the supporting record, documented that climate change caused by human emissions of GHGs (including HFCs) threatens the public health of the population of the United States. It explained that by raising average temperatures, climate change increases the likelihood of heat waves, which are associated with increased deaths and illnesses (74 FR 66497, December 15, 2009). While climate change also likely reduces cold-related mortality, evidence indicates that the increases in heat mortality will be larger than the decreases in cold mortality in the United States (74 FR 66525, December 15, 2009). The 2009 Endangerment Finding further explained that, compared with a future without climate change, climate change is expected to increase tropospheric ozone pollution over broad areas of the United States, including in the largest metropolitan

[27] In describing these 2009 Findings, EPA is neither reopening nor revisiting them.

areas with the worst tropospheric ozone problems, and thereby increase the risk of adverse effects on public health (74 FR 66525, December 15, 2009). Climate change is also expected to cause more intense hurricanes and more frequent and intense storms of other types and heavy precipitation, with impacts on other areas of public health, such as the potential for increased deaths, injuries, infectious and waterborne diseases, and stress-related disorders (74 FR 66525, December 15, 2009). Children, elderly people, and poor people are among the most vulnerable to these climate-related health effects (74 FR 66498, December 15, 2009).

The 2009 Endangerment Finding also documented, together with the extensive scientific and technical evidence in the supporting record, that climate change touches nearly every aspect of public welfare [28] in the United States, including changes in water supply and quality due to increased frequency of drought and extreme rainfall events; increased risk of storm surge and flooding in coastal areas and land loss due to inundation; increases in peak electricity demand and risks to electricity infrastructure; predominantly negative consequences for biodiversity and the provisioning of ecosystem goods and services; and the potential for significant agricultural disruptions and crop failures (though offset to some extent by carbon fertilization). These impacts are also global and may exacerbate problems outside the United States that raise humanitarian, trade, and national security issues for the United States (74 FR 66530, December 15, 2009).

In 2016, the Administrator similarly issued Endangerment and Cause or Contribute Findings for GHG emissions from aircraft under CAA section 231(a)(2)(A) (81 FR 54422, August 15, 2016).[29] In the 2016 Endangerment Finding, the Administrator found that the body of scientific evidence amassed in the record for the 2009 Endangerment Finding compellingly supported a similar endangerment finding under CAA section 231(a)(2)(A) and also found that the science assessments released between the 2009 and the 2016 Endangerment Findings ''strengthen and further support the judgment that GHGs in the atmosphere may reasonably be anticipated to endanger the public health and welfare of current and future generations'' (81 FR 54424, August 15, 2016).

Since the 2016 Endangerment Finding, the climate has continued to change, with new records being set for several climate indicators such as global average surface temperatures, GHG concentrations, and sea level rise. Moreover, heavy precipitation events have increased in the Eastern United States, while agricultural and ecological drought has increased in the Western United States, along with more intense and larger wildfires.[30] These and other trends are examples of the risks discussed in the 2009 and 2016 Endangerment Findings that have already been experienced. Additionally, major scientific assessments continue to demonstrate advances in our understanding of the climate system and the impacts that GHGs have on public health and welfare both for current and future generations. According to the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report, ''it is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.'' [31] These updated observations and projections document the rapid rate of current and future climate change both globally and in the United States.[32] [33]

C. What regulatory programs addressing refrigerants has EPA already established under the Clean Air Act?

EPA is issuing regulations that are designed to establish a comprehensive HFC management program that serves purposes including maximizing HFC reclamation and minimizing the release of HFCs from equipment while coordinating these efforts with other similar programs where appropriate. EPA has an extensive history under CAA Title VI regulating the sectors in which HFCs and substitutes are typically used, including where they are used as refrigerants and for other purposes. For example, EPA has regulated stationary refrigeration and air conditioning applications under CAA section 608, as well as MVACs under CAA section 609, and has evaluated alternative substances for refrigeration, air conditioning, and other uses under the Significant New Alternatives Policy (SNAP) program under CAA section 612.

1. National Recycling and Emission Reduction Program (CAA Section 608)

CAA section 608, titled ''National Recycling and Emission Reduction Program,'' has three main components. First, CAA section 608(a) requires EPA to establish standards and requirements regarding the use and disposal of class I and class II substances.[34] The second component, CAA section 608(b), requires that the regulations issued pursuant to subsection (a) contain requirements for the safe disposal of class I and class II substances. The third component, CAA section 608(c), prohibits the knowing venting, release, or disposal of ODS refrigerants [35] and their substitutes [36] in the course of maintaining, servicing, repairing, or disposing of appliances or industrial process refrigeration (IPR). EPA refers to this third component as the ''venting prohibition.'' CAA section 608(c)(1) establishes the venting prohibition for ODS refrigerants effective July 1, 1992, and it includes an exemption from this prohibition for ''[d]e minimis releases associated with good faith attempts to recapture and recycle or safely dispose'' any such substance. CAA section 608(c)(2) extends CAA section 608(c)(1) to substitute refrigerants, effective November 15, 1995. CAA section 608(c)(2) also includes a provision that allows the Administrator to exempt a substitute refrigerant from the venting prohibition if he or she determines that such venting, release, or disposal of a

[28] The CAA states in section 302(h) that ''[a]ll language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, manmade 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, whether caused by transformation, conversion, or combination with other air pollutants.'' 42 U.S.C. 7602(h).

[29] In describing these 2016 Findings, EPA is neither reopening nor revisiting them.

[30] An additional resource for indicators can be found at *https://www.epa.gov/climate-indicators.*

[31] IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3–32, doi:10.1017/9781009157896.001.

[32] USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018. Available at: *https://nca2018.globalchange.gov.*

[33] IPCC, 2021.

[34] A class I or class II substance is an ozone-depleting substance (ODS) listed at 40 CFR part 82, subpart A, appendix A or appendix B, respectively. This document refers to class I and class II substances collectively as ODS.

[35] The term ''ODS refrigerant'' as used in this document refers to any refrigerant or refrigerant blend in which one or more of the components is a class I or class II substance.

[36] The term ''substitute'' for the purposes of the regulations under CAA section 608 is defined at 40 CFR 82.152.

substitute refrigerant ''does not pose a threat to the environment.''

EPA first issued regulations under CAA section 608 on May 14, 1993 (58 FR 28660, ''1993 Rule''), to establish the national refrigerant management program for ODS refrigerants recovered during the service, repair, or disposal of air conditioning and refrigeration appliances. Since then, EPA has revised these regulations, which are found at 40 CFR part 82, subpart F, (''subpart F''), through subsequent rulemakings published between 1994 and 2020. Regulations issued under CAA section 608 include, among other things, the venting prohibition and sales restrictions for refrigerants (40 CFR 82.154); safe disposal of appliances (40 CFR 82.155); proper practices for the evacuation of refrigerant from appliances (40 CFR 82.156); required practices for appliance maintenance and leak repair (40 CFR 82.157); standards for recovery and/or recycling equipment (40 CFR 82.158); technician and reclaimer certification requirements (40 CFR 82.161 and 82.164, respectively); and reporting and recordkeeping requirements (40 CFR 82.166). Appendices A through E at 40 CFR part 82, subpart F, provide, among other things, specifications for refrigerants; performance standards for refrigerant recovery, recycling, and/or reclaiming equipment; and standards for becoming a certifying program for technicians.

As it pertains to regulations under CAA section 608, EPA has used the term ''non-exempt substitute'' to refer to non-ozone depleting refrigerants that have not been exempted from the venting prohibition under CAA section 608(c)(2) and 40 CFR 82.154(a) in the relevant end use. Similarly, the term ''exempt substitute'' refers to a non-ozone depleting refrigerant that has been exempted from the venting prohibition under CAA section 608(c)(2) and 40 CFR 82.154(a) in the relevant end use. A few exempt substitutes have been exempted from the venting prohibition in all applications. Notably, in 2016, EPA updated existing refrigerant management requirements and extended the full set of the subpart F refrigerant management requirements, which prior to that rule applied only to ODS refrigerants,[37] to non-exempt substitute refrigerants, such as HFCs and hydrofluoroolefins (HFOs). See 81 FR 82272 (November 18, 2016), hereafter ''2016 CAA Section 608 Rule.'' Among the subpart F requirements extended to non-exempt substitute refrigerants in the 2016 CAA Section 608 Rule were provisions that restricted the servicing of appliances and the sale of refrigerant to certified technicians; specified the proper evacuation levels before opening an appliance; required the use of certified refrigerant recovery and/or recycling equipment; required refrigerant be recovered from appliances prior to disposal; required appliances have a servicing aperture or process stub to facilitate refrigerant recovery; required refrigerant reclaimers be certified to reclaim and sell used refrigerant; and established standards for technician certification programs, recovery equipment, and the purity of reclaimed refrigerant. The 2016 CAA Section 608 Rule also extended the appliance maintenance and leak repair provisions, currently codified at 40 CFR 82.157, to appliances that contain 50 or more pounds of non-exempt substitute refrigerant. It also made numerous revisions to improve the efficacy of the refrigerant management program as a whole, such as revisions of regulatory provisions for increased clarity and readability, and removal of provisions that had become obsolete.

After promulgation, the Agency reviewed the 2016 CAA Section 608 Rule, focusing in particular on whether the Agency had the statutory authority to extend the full set of subpart F refrigerant management regulations to non-exempt substitute refrigerants, such as HFCs and HFOs. In 2018, EPA proposed to withdraw the extension of the provisions of 40 CFR 82.157 to appliances using only non-exempt substitute refrigerants (83 FR 49332, October 1, 2018).[38] In 2020, EPA published a final rule (85 FR 14150, March 11, 2020, hereafter ''2020 CAA Section 608 Rule'') withdrawing the extension of the leak repair requirements—including requirements for repairing leaks, conducting leak inspections, and keeping applicable records—for appliances containing only such substitute refrigerants. Other subpart F provisions that were extended to substitute refrigerants in the 2016 CAA Section 608 Rule, as mentioned in the previous paragraph, were left in place for appliances containing HFCs and other non-exempt substitute refrigerants. There were no changes to any of the regulatory requirements for ODS in the 2020 CAA Section 608 Rule.

Petitions for judicial review were filed on the 2016 CAA Section 608 Rule and separately on the 2020 CAA Section 608 Rule. Two industry coalitions, the National Environmental Development Association's Clean Air Project (NEDA/CAP) and the Air Permitting Forum (APF), filed petitions for judicial review of the 2016 CAA Section 608 Rule in the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) in 2017. APF also filed an administrative petition for reconsideration before EPA regarding the 2016 CAA Section 608 Rule.[39] In 2020, the Natural Resources Defense Council (NRDC) and a group of State and municipal petitioners [40] filed petitions for judicial review of the 2020 CAA Section 608 Rule in the D.C. Circuit. NEDA/CAP also filed an administrative petition regarding the 2020 CAA Section 608 Rule, styled as a petition for reconsideration or in the alternative a petition for rulemaking.[41] These four petitions for review were all consolidated (Case No. 20–1150, D.C. Cir.) in July of 2020, and in August of 2020 the court severed four issues raised in NEDA/CAP and APF's administrative petitions for reconsideration and assigned them to a different case (Case No. 20–1309, D.C. Cir.). Both cases are now being held in abeyance.

The E.O. issued on January 20, 2021, ''Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,'' directed review of certain agency actions taken between January 20, 2017, and January 20, 2021 (86 FR 7037, January 20, 2021). The 2020 CAA Section 608 Rule was one of the actions subject to review. In light of this review and the Agency's consideration of subsection (h) of the AIM Act, EPA has developed this rulemaking, which, among other things, involves evaluating the application of leak repair requirements to appliances using HFCs and substitute refrigerants under subsection (h). Because this action is rooted in EPA's authority under the AIM Act, this rulemaking does not reopen or otherwise address the question of the authority for such requirements under the CAA. Similarly, EPA is not reopening or revisiting any of the regulations under CAA section 608 in this rulemaking.

[37] The only 40 CFR part 82, subpart F requirements that applied to substitute refrigerants prior to the 2016 CAA Section 608 Rule were the venting prohibition and certain exemptions from that prohibition, as set forth in section 82.154(a).

[38] Ozone-depleting refrigerants and appliances that contain or use any amount of ODS continue to be subject to all applicable subpart F requirements, including those in 40 CFR 82.157.

[39] APF Petition for Reconsideration, January 2017, available: *https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0453-0228.*

[40] The State and municipal petitioners are the State of New York, State of Connecticut, State of Illinois, State of Maine, State of Maryland, State of Minnesota, State of New Jersey, State of Oregon, Commonwealth of Virginia, State of Washington, District of Columbia, and City of New York.

[41] NEDA/CAP Petitions for Reconsideration/Petition for Rulemaking, May 2020, available: *https://www.regulations.gov/document?D=EPA-HQ-OAR-2017-0629-0345.*

2. Motor Vehicle Air Conditioning Servicing Program (CAA section 609)

CAA section 609 directs EPA to issue regulations establishing standards and requirements for the servicing of MVACs. For purposes of the regulations implementing CAA section 609, ''motor vehicle air conditioners'' [42] is defined at 40 CFR 82.32(d) as mechanical vapor compression refrigeration equipment used to cool the driver's or passenger's compartment of any motor vehicle. This definition further states that it is not intended to encompass certain hermetically sealed refrigeration systems used on motor vehicles for refrigerated cargo and the air conditioning systems on passenger buses. For purposes of the section CAA section 609 regulations, ''motor vehicle'' is defined at 40 CFR 82.32(c) as any vehicle which is self-propelled and designed for transporting persons or property on a street or highway, including but not limited to passenger cars, light-duty vehicles, and heavy-duty vehicles. This definition further provides that it does not include a vehicle where final assembly of the vehicle has not been completed by the original equipment manufacturer (OEM).

Under CAA section 609 and regulations that implement it, no person repairing or servicing motor vehicles for consideration (*e.g.,* payment or bartering) may perform any service on an MVAC that involves the refrigerant [43] without properly using approved refrigerant recovery or recovery and recycling equipment, and no such person may perform such service for consideration unless such person has been properly trained and certified. CAA section 609 also contains restrictions on the sale or distribution, or offer for sale or distribution, of class I and class II substances suitable for use as a refrigerant in MVACs in containers of less than 20 pounds, except to a person performing service for consideration on MVAC systems.

Regulations issued under CAA section 609, codified at 40 CFR part 82, subpart B, include, among other things, prohibited and required practices for persons repairing and servicing MVACs for consideration (40 CFR 82.34); requirements for refrigerant handling equipment (40 CFR 82.36); approval processes for independent standards testing organizations (40 CFR 82.38); requirements for certifications that any person servicing or repairing MVACs for consideration must submit to EPA; and related recordkeeping requirements (40 CFR 82.42). Appendices A through F at 40 CFR part 82, subpart B, provide minimum operating requirements for equipment used for the recovery, recycling and/or recharging of refrigerant used in MVACs.

In 1992, EPA published a rule (57 FR 31242, July 14, 1992) under CAA section 609 establishing standards and requirements for servicing of MVACs and restricting the sale of small containers of ODS. The regulations, which appear in 40 CFR part 82, subpart B, require persons who repair or service MVACs for consideration to be certified in refrigerant recovery and recycling and to properly use approved equipment when performing service involving the refrigerant. Consistent with the definition in CAA section 609(b)(1), ''refrigerant'' is defined in subpart B as any class I or class II substance used in MVACs, and to include any substitute substance effective November 15, 1995. The 1992 CAA section 609 Rule also defined approved refrigerant recycling equipment as equipment certified by the Administrator or an approved organization as meeting either one of the standards in 40 CFR 82.36. Such equipment extracts and recycles refrigerant or extracts but does not recycle refrigerant, allowing that refrigerant to be subsequently recycled on-site or to be sent off-site for reclamation.[44] EPA based the regulatory equipment standards in subpart B on those developed by the Society of Automotive Engineers (SAE). They cover service procedures for dichlorodifluoromethane (CFC–12 or R–12) recover/recycle equipment (SAE J1989, issued in October 1989); test procedures to evaluate R–12 recover/recycle equipment (SAE J1990, issued in October 1989 and revised in 1991); and a purity standard for recycled R–12 refrigerant (SAE J1991, issued in October 1989). Only equipment certified to meet the standards set forth in appendix A at 40 CFR part 82, subpart B, or that meets the criteria for substantially identical equipment, was approved under CAA section 609 for use in the servicing of MVACs at that time.

EPA issued another rule under CAA section 609 in 1997 (62 FR 68026, December 30, 1997) in response to the increasing use of substitute refrigerants, particularly 1,1,1,2-tetrafluoroethane (HFC–134a or R–134a). The 1997 CAA Section 609 Rule established standards and requirements for the servicing of MVACs that use any refrigerant other than R–12. The rule also stated that refrigerant (whether R–12 or a substitute) recovered from motor vehicles at motor vehicle disposal facilities may be re-used in the MVAC service sector only if it has been properly recovered and recycled by persons who are either employees, owners, or operators of the facilities, or technicians certified under CAA section 609, using approved equipment. This differs from the rules established under CAA section 608, in which no person may sell or distribute, or offer for sale or distribution, used refrigerant (including both ODS and non-exempt substitutes such as HFCs) unless it has first been reclaimed by a certified reclaimer (40 CFR 82.154(d)). The 1997 CAA Section 609 Rule also established conditions under which owners and operators of motor vehicle disposal facilities may sell refrigerant recovered from such vehicles to technicians certified under CAA section 609.

3. Significant New Alternatives Policy Program (CAA section 612)

EPA identifies and evaluates substitutes for ODS in certain industrial sectors, including RACHP, aerosols, and foams. To a very large extent, HFCs are used in the same sectors and subsectors as where ODS historically have been used. Under SNAP, EPA evaluates acceptability of substitutes for ODS based primarily on the potential human health and environmental risks, relative to other substances used for the same purpose. In so doing, EPA assesses atmospheric effects such as ozone depletion potential (ODP) and GWP, exposure assessments, toxicity data, flammability, and other environmental impacts. This assessment could take a wide range of forms, such as a theoretical evaluation of the properties of the substitute, a computer simulation of the substitute's performance in the sector or subsector, lab-scale (table-top)

[42] A related definition for ''MVAC-like appliance'' is found at 40 CFR 82.152: MVAC-like appliance means a mechanical vapor compression, open-drive compressor appliance with a full charge of 20 pounds or less of refrigerant used to cool the driver's or passenger's compartment of off-road vehicles or equipment. This includes, but is not limited to, the air-conditioning equipment found on agricultural or construction vehicles. This definition is not intended to cover appliances using R–22 refrigerant.

[43] Section 609(b)(1) defines the term ''refrigerant,'' ''[a]s used in this section'', to mean ''any class I or class II substance used in a motor vehicle air conditioner. Effective 5 years after November 15, 1990, the term 'refrigerant' shall also include any substitute substance.'' EPA's implementing regulations include a parallel definition of this term at 40 CFR 82.32(f).

[44] Equipment that extracts and recycles refrigerant is referred to as recover/recycle equipment. Equipment that extracts but does not recycle refrigerant is referred to as equipment that recovers but does not recycle refrigerant, or as recover-only equipment.

evaluations of the substitute, or equipment tests under various conditions.

IV. How is EPA regulating the management of HFCs and their substitutes?

As described in the following sections, EPA is establishing an ER&R program for the management of HFCs under subsection (h) of the AIM Act that includes requirements regarding several topics, including leak repair requirements for certain refrigerant-containing appliances and installation and use of ALD systems for certain equipment; requirements for the servicing and/or repair of certain refrigerant-containing equipment; requirements for the servicing, repair, disposal, or installation of fire suppression equipment that contains HFCs, with the purpose of minimizing the release of HFCs from that equipment, including requirements for the initial installation and servicing and/or repair of fire suppression equipment with recycled HFCs, as well as requirements related to technician training in the fire suppression sector; and recovery of HFCs from disposable cylinders before discarding. As discussed in greater detail in section X of this preamble, EPA intends for the regulatory provisions established under subsection (h) of the AIM Act in this final action to be able to stand independently from one another and has designed them accordingly. For example, the leak repair requirements for refrigerant-containing appliances are designed to operate independently from the requirements for servicing, repair, disposal, or installation of fire suppression equipment.

A. What definitions is EPA implementing under subsection (h)?

EPA has operated a refrigerant management program for decades under the CAA. More recently, EPA established regulatory programs related to the HFC phasedown and the technology transitions provisions under the AIM Act. Rules implementing those CAA and AIM Act programs have included defined terms, which EPA was mindful of when proposing and finalizing definitions for the ER&R program under subsection (h) of the AIM Act.

The Allocation Framework Rule (86 FR 55116, October 5, 2021) established regulatory definitions at 40 CFR part 84, subpart A to implement the framework for phasing down HFCs under the AIM Act, with certain revisions to the definitions section at 40 CFR 84.3 (see 88 FR 46836, July 20, 2023).[45] Subsequently, the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023) established additional regulatory definitions in 40 CFR part 84, subpart B, at 40 CFR 84.52 to implement subsection (i) of the AIM Act. To maintain consistency, except as otherwise explained in this rule, EPA generally intends to use terms in this rulemaking, and in the new subpart C established by this rule, consistent with their definitions in subparts A and B, but there may be exceptions, such as where one term has different definitions under different subparts. The definitions under subpart A had already been finalized when this rule was proposed. Accordingly, consistent with the proposal, for terms not defined in subpart C but that are defined in subpart A (40 CFR 84.3) those definitions apply. As noted previously, EPA also considered the definitions in subpart B (40 CFR 84.52) in establishing the definitions and regulations in subpart C but is not incorporating those definitions into subpart C, in part to avoid potential confusion if the same term was defined differently in subparts A and B, but not defined in subpart C. EPA is also establishing definitions for terms that are applicable only under 40 CFR part 84, subpart C, and do not have counterparts in the definitions under 40 CFR part 84, subparts A or B.

Many of the terms and definitions considered in this action are similar to those used to implement programs under CAA sections 608 and 609, with only limited changes as needed to conform with the AIM Act or this action. EPA considered these previously defined terms, from 40 CFR 82.152 and 40 CFR 82.32, where they are used in the same or substantially similar manner. The regulated community for these regulations under subsection (h) and those under CAA sections 608 and 609 overlap; therefore, maintaining the same or similar definitions, where consistent with AIM Act requirements and the purposes of this action, facilitates implementation by those who have been using and are familiar with these terms. Because EPA's authority under the AIM Act extends beyond the sectors covered by 40 CFR part 82, subpart F, where it is necessary or helpful for clarity, EPA is specifying certain definitions that apply to the terms as they refer to refrigerant-containing equipment or as they apply to fire suppression equipment (see, *e.g.,* the definition for ''disposal''). EPA may consider adding additional subsectors in a future rulemaking and accordingly may consider updating these definitions in the future.

1. Terms That Did Not Generate Comment and That EPA Is Finalizing as Proposed

Many proposed definitions did not garner specific comment. For the reasons discussed in the proposed rule, EPA is finalizing the following terms substantively as proposed, although in some instances with minor edits that do not alter their meaning (*e.g.,* a non-substantive change in a word's tense or removal of redundant language [46]):

Certified technician means a technician that has been certified per the provisions at 40 CFR 82.161.

Component, as it relates to a refrigerant-containing appliance, means a part of the refrigerant circuit within an appliance including but not limited to compressors, condensers, evaporators, receivers, and all of its connections and subassemblies.

Custom-built means that the industrial process refrigeration equipment or any of its components cannot be purchased and/or installed without being uniquely designed, fabricated, and/or assembled to satisfy a specific set of industrial process conditions.

Fire suppression technician means any person who in the course of servicing, repair, disposal, or installation of fire suppression equipment could be reasonably expected to violate the integrity of the fire suppression equipment and therefore release fire suppressants [47] into the environment.

Follow-up verification test, as it relates to a refrigerant-containing appliance, means those tests that involve checking the repairs to an appliance after a successful initial verification test and after the appliance has returned to normal operating characteristics and conditions to verify

[45] The revisions in 40 CFR 84.3 are described in EPA's Allowance Allocation Methodology for 2024 and Later Years rule, which was published on July 20, 2023 (88 FR 46836). That rulemaking focuses on the second phase of the HFC phasedown and, among other things, establishes the allocation methodology for the ''general pool'' of HFC production and consumption allowances for 2024 through 2028. Available at: *https://www.federalregister.gov/documents/2023/07/20/2023-14312/phasedown-of-hydrofluorocarbons-allowance-allocation-methodology-for-2024-and-later-years.*

[46] EPA notes that in a few instances the proposed definition for a term included a phrase like ''as used in this subpart'' or ''for purposes of this subpart.'' EPA is not including those phrases in the final definitions, as the second sentence of § 84.102 in the final rule already makes clear that the definitions are for ''purposes of this subpart C.''

[47] As described in Section IV.F.1, EPA views the terms, ''fire suppressants'' and ''fire suppression agents'' as interchangeable for this rule.

that the repairs were successful. Potential methods for follow-up verification tests include but are not limited to the use of soap bubbles as appropriate, electronic or ultrasonic leak detectors, pressure or vacuum tests, fluorescent dye and black light, infrared or near infrared tests, and handheld gas detection devices.

Full charge, as it relates to a refrigerant-containing appliance, means the amount of refrigerant required for normal operating characteristics and conditions of the appliance as determined by using one or a combination of the following four methods:

(1) Use of the equipment manufacturer's determination of the full charge;

(2) Use of appropriate calculations based on component sizes, density of refrigerant, volume of piping, and other relevant considerations;

(3) Use of actual measurements of the amount of refrigerant added to or evacuated from the appliance, including for seasonal variances; and/or

(4) Use of an established range based on the best available data regarding the normal operating characteristics and conditions for the appliance, where the midpoint of the range will serve as the full charge.

Initial verification test, as it relates to a refrigerant-containing appliance, means those leak tests that are conducted after the repair is finished to verify that a leak or leaks have been repaired before refrigerant is added back to the appliance.

Leak inspection, as it relates to a refrigerant-containing appliance, means the examination of an appliance to detect and determine the location of refrigerant leaks. Potential methods include but are not limited to ultrasonic tests, gas-imaging cameras, bubble tests as appropriate, or the use of a leak detection device operated and maintained according to manufacturer guidelines. Methods that determine whether the appliance is leaking refrigerant but not the location of a leak, such as standing pressure/vacuum decay tests, sight glass checks, viewing receiver levels, pressure checks, and charging charts, must be used in conjunction with methods that can determine the location of a leak.

Leak rate, as it relates to a refrigerant-containing appliance, means the rate at which an appliance is losing refrigerant, measured between refrigerant charges. The leak rate is expressed in terms of the percentage of the appliance's full charge that would be lost over a 12-month period if the current rate of loss were to continue over that period. The rate must be calculated using one of the following methods. The same method must be used for all appliances subject to the leak repair requirements located at an operating facility.

(1) Annualizing Method.

(i) Step 1. Take the number of pounds of refrigerant added to the appliance to return it to a full charge, whether in one addition or in multiple additions related to same leak, and divide it by the number of pounds of refrigerant the appliance normally contains at full charge;

(ii) Step 2. Take the shorter of the number of days that have passed since the last day refrigerant was added or 365 days and divide that number by 365 days;

(iii) Step 3. Take the number calculated in Step 1 and divide it by the number calculated in Step 2; and

(iv) Step 4. Multiply the number calculated in Step 3 by 100 to calculate a percentage. This method is summarized in the following formula:

$$\text{Leak rate (\% per year)} = \frac{\text{pounds of refrigerant added}}{\text{pounds of refrigerant in full charge}} \times \frac{\text{365 days/year}}{\text{shorter of: \# days since refrigerant last added or 365 days}} \times 100\%$$

(2) Rolling Average Method.

(i) Step 1. Take the sum of the pounds of refrigerant added to the appliance over the previous 365-day period (or over the period that has passed since the last successful follow-up verification test showing all identified leaks in the appliance were repaired, if that period is less than one year);

(ii) Step 2. Divide the result of Step 1 by the pounds of refrigerant the appliance normally contains at full charge; and

(iii) Step 3. Multiply the result of Step 2 by 100 to obtain a percentage. This method is summarized in the following formula:

$$\text{Leak rate (\% per year)} = \frac{\text{pounds of refrigerant added over past 365 days (or since the last successful follow-up verification test showing all identified leaks in the appliance were repaired, if that period is less than one year)}}{\text{pounds of refrigerant in full charge}} \times 100\%$$

EPA further notes that, as discussed in section IV.C.3 of this preamble, owner or operators may preemptively repair leaks prior to adding refrigerant and calculating the leak rate for a refrigerant-containing appliance. After the completion of preemptive repair, an owner or operator must calculate the leak rate to see if the refrigerant-containing appliance was leaking above the applicable leak rate threshold and complete the full suite of leak repair requirements as described in section IV.C.3 (*e.g.,* verification tests, leak inspections, etc.) if the appliance was leaking above the applicable threshold. If the refrigerant-containing appliance was found to be leaking below the applicable leak rate threshold then no further action is necessary after the completion of the preemptive repair. Alternatively, an owner/operators may use the amount of refrigerant lost in lieu of the amount of refrigerant added to calculate the leak rate prior to adding refrigerant if they have a valid method of determining the amount of refrigerant lost (*e.g.,* evacuating the appliance and comparing the amount of refrigerant evacuated to the full charge).

Mothball, as it relates to a refrigerant-containing appliance, means to evacuate refrigerant from an appliance, or the

affected isolated section or component of an appliance, to at least atmospheric pressure, and to temporarily shut down that appliance.

Motor vehicle, means any vehicle which is self-propelled and designed for transporting persons or property on a street or highway, including but not limited to passenger cars, light-duty vehicles, and heavy-duty vehicles. This definition does not include a vehicle where final assembly of the vehicle has not been completed by the original equipment manufacturer.

Motor vehicle air conditioner (MVAC), means mechanical vapor compression refrigerant-containing appliances used to cool the driver's or passenger's compartment of any motor vehicle. This definition is intended to have the same meaning as in 40 CFR 82.32.

Normal operating characteristics and conditions, as it relates to a refrigerant-containing appliance, means appliance operating temperatures, pressures, fluid flows, speeds, and other characteristics, including full charge of the appliance, that would be expected for a given process load and ambient condition during normal operation. Normal operating characteristics and conditions are marked by the absence of atypical conditions affecting the operation of the appliance.

Owner or operator, means any person who owns, leases, operates, or controls any equipment, or who controls or supervises any practice, process, or activity that is subject to any requirement pursuant to this subpart.

Recycling, when referring to fire suppression or fire suppressants, means the testing and/or reprocessing of regulated substances used in the fire suppression sector to certain purity standards.

Refrigerant circuit, as it relates to a refrigerant-containing appliance, means the parts of an appliance that are normally connected to each other (or are separated only by internal valves) and are designed to contain refrigerant.

Reprocess, means using procedures such as filtering, drying, distillation, and other chemical procedures to remove impurities from a regulated substance or a substitute for a regulated substance.

Retire, as it relates to a refrigerant-containing appliance, means the removal of the refrigerant and the disassembly or impairment of the refrigerant circuit such that the appliance as a whole is rendered unusable by any person in the future.

Seasonal variance, as it relates to a refrigerant-containing appliance, means the removal of refrigerant from an appliance due to a change in ambient conditions caused by a change in season, followed by the subsequent addition of an amount that is less than or equal to the amount of refrigerant removed in the prior change in season, where both the removal and addition of refrigerant occurs within one consecutive 12-month period.

Stationary refrigerant-containing equipment means refrigerant-containing equipment, as defined in this subpart, that is not an MVAC or MVAC-like appliance, as defined in this subpart.

EPA notes that for this definition the phrase ''motor vehicle air conditioner'' was used in the proposed definition, but in the final definition EPA is replacing that phrase with its abbreviation ''MVAC'' to maintain consistency with other definitions in this rule. This change does not alter the meaning of the term.

Technician, as it relates to any person who works with refrigerant-containing appliances, means any person who in the course of servicing, repair, or installation of a refrigerant-containing appliance (except MVACs) could be reasonably expected to violate the integrity of the refrigerant circuit and therefore release refrigerants into the environment. Technician also means any person who, in the course of disposal of a refrigerant-containing appliance (except small appliances as defined in 40 CFR 82.152, MVACs, and MVAC-like appliances), could be reasonably expected to violate the integrity of the refrigerant circuit and therefore release refrigerants from the appliance into the environment. Activities reasonably expected to violate the integrity of the refrigerant circuit include but are not limited to: Attaching or detaching hoses and gauges to and from the appliance; adding or removing refrigerant; adding or removing components; and cutting the refrigerant line. Activities such as painting the appliance, rewiring an external electrical circuit, replacing insulation on a length of pipe, or tightening nuts and bolts are not reasonably expected to violate the integrity of the refrigerant circuit. Activities conducted on refrigerant-containing appliances that have been properly evacuated pursuant to 40 CFR 82.156 are not reasonably expected to release refrigerants unless the activity includes adding refrigerant to the appliance. Technicians include but are not limited to installers, contractor employees, in-house service personnel, and owners and/or operators of refrigerant-containing appliances.

EPA further notes that this definition deviates slightly from the definition of ''technician'' at 40 CFR 82.152 to conform with the AIM Act grant of authority. EPA is also defining ''certified technician'' to make it clear that EPA is referring to persons certified per 40 CFR 82.161 for the purposes of these regulations. When specifically referring to technicians certified under 40 CFR part 82, subpart B, the term ''609-certified technician'' is used.

2. Terms That Received Comment or That EPA Is Modifying

This section discusses comments received on specific proposed definitions, EPA's responses to those comments, and any changes made to the final definitions in response to those comments. It also includes discussion of certain modifications in the final rule to definitions that did not receive comment as discussed previously.

Comfort cooling. EPA proposed to define this term as ''the refrigerant-containing appliances used for air conditioning to provide cooling in order to control heat and/or humidity in occupied facilities including but not limited to residential, office, and commercial buildings. Comfort cooling appliances include but are not limited to chillers, commercial split systems, and packaged roof-top units.''

As described below, after considering public comment on this definition, EPA is modifying its definition of ''comfort cooling'' to include dual-function heat pumps as an additional example of the term.

Comment: One commenter requested that EPA's definition of ''comfort cooling'' include single-function (heat only) and dual-function (heating and cooling) heat pump appliances.

Response: EPA agrees that dual-function heat pumps are included within the definition of ''comfort cooling'' because those appliances provide cooling. To provide another relevant example of comfort cooling applications, EPA is adding dual-function heat pumps to the illustrative list of examples in the definition. EPA is not including single-function heat pump applications as an example of an application included in ''comfort cooling'' because EPA does not view it as fitting within this particular category as the definition is currently drafted. EPA may in the future consider proposing to include single-function heat pump applications under comfort cooling or under a different category of equipment.

Commercial refrigeration. EPA proposed this definition to mean ''the refrigerant-containing appliances used in the retail food and cold storage warehouse subsectors. Retail food appliances include the refrigeration equipment found in supermarkets,

convenience stores, restaurants and other food service establishments. Cold storage includes the refrigeration equipment used to store meat, produce, dairy products, and other perishable goods.''

EPA is finalizing two modifications to the proposed definition of ''commercial refrigeration.'' Both modifications involved replacing the term ''refrigeration equipment'' in sentences two and three of the proposed definition of the term to ''refrigeration-containing appliance'' in the finalized term. These changes were made because ''refrigeration equipment'' is not a defined term under this subpart, but ''refrigeration-containing appliance'' is. EPA did not receive comment on the definition of ''commercial refrigeration.''

Disposal. EPA's proposed definition of ''disposal'' (see 88 FR 72216, 72298, October 19, 2023) applied to ''refrigerant-containing appliances.'' This was done to maintain consistency with the definition of ''disposal'' in 40 CFR 82.161 which applies to ''appliances.'' EPA is finalizing a definition of disposal with two parts, with the first part relating to ''refrigerant-containing equipment'' and the second part relating to ''fire suppression equipment.'' Furthermore, in the first part of the final definition EPA is using the term ''refrigerant-containing equipment'' instead of ''refrigerant-containing appliance'' to more fully align with the regulatory definition with how the term disposal is used under subsection (h)(1) of the AIM Act, which states ''the Administrator shall promulgate regulations to control, where appropriate, any practice process or activity regarding servicing, repair, disposal, or installation of *equipment* (emphasis added).'' ''Refrigerant-containing equipment'' is broader than ''refrigerant-containing appliance'' and includes everything covered under the definition of ''refrigerant-containing appliance'' (*e.g.,* any air conditioner, MVAC, refrigerator, chiller, or freezer) while also including refrigerant-containing components. However, the regulatory requirements related to disposal of refrigerant-containing equipment established in this final action at 84.106 apply to refrigerant-containing appliances (rather than refrigerant-containing equipment), and this change in the definition is not intended to broaden the scope of these requirements.

EPA added a second part to the final definition of disposal to distinguish disposal of fire suppression equipment. Since this final rule regulates the disposal of fire suppression equipment, which may differ from the disposal of refrigerant-containing equipment, the Agency is specifying how the term ''disposal'' relates to fire suppression equipment in this subpart, for greater clarity of the regulatory provisions. This final definition of disposal is analogous to the definition of ''disposal of halon-containing equipment'' in the halon emissions reduction requirements at 40 CFR part 82, subpart H, which EPA referenced in the proposal, describing its intent to propose requirements similar to those in subpart H. The final definition parallels the definition of disposal at 40 CFR 82.260, with the words ''fire suppression equipment'' replacing the term ''halon-containing equipment'' to maintain consistency with regulations for the disposal of halon-containing equipment, including halon-containing equipment used in fire suppression applications. The revised definition can be read in full below:

Disposal, as it relates to refrigerant-containing equipment, means the process leading to and including:

(1) The discharge, deposit, dumping, or placing of any discarded refrigerant-containing equipment into or on any land or water;

(2) The disassembly of any refrigerant-containing equipment for discharge, deposit, dumping, or placing of its discarded component parts into or on any land or water;

(3) The vandalism of any refrigerant-containing equipment such that the refrigerant is released into the environment or would be released into the environment if it had not been recovered prior to the destructive activity;

(4) The disassembly of any refrigerant-containing equipment for reuse of its component parts; or

(5) The recycling of any refrigerant-containing equipment for scrap.

Disposal, as it relates to fire suppression equipment, means the process leading to and including:

(1) The discharge, deposit, dumping, or placing of any fire suppression equipment into or on any land or water;

(2) The disassembly of any fire suppression equipment for discharge, deposit, dumping, or placing of its discarded component parts into or on any land or water; or

(3) The disassembly of any fire suppression equipment for reuse of its component parts.

Comment: One commenter asserted that the proposed definition of disposal (which as originally proposed was specific to a ''refrigerant-containing appliance'') is inconsistent with the principles of safe disposal under 40 CFR 82.155 and with the definition of disposal under RCRA. The commenter asserted that parts 4 and 5 of the definition incorrectly conflate two different processes (disassembly and recycling). The commenter further stated that since there are ''safe disposal'' regulations at 40 CFR 82.155, it is counterproductive to have a definition of disposal that includes principles of recycling, because disposal and recycling are entirely different processes. The commenter also stated that the definition of disposal under 40 CFR 82.155 and 40 CFR 84.102 is incompatible with RCRA's definition of disposal under 40 CFR 260.10, which does not include practices of disassembly or recycling. The commenter requested that EPA align the proposed definition with those in 40 CFR 82 subparts B and F to minimize complications and contradictions between these AIM Act subsection (h) regulations and CAA title VI regulations.

Response: EPA is finalizing a definition of ''disposal,'' as it relates to refrigerant-containing equipment, that parallels the definition in 40 CFR 82.152. To the extent the commenter is suggesting that the proposed definition of disposal is inconsistent with the requirements in 82.155, EPA disagrees. Rather, the definition in 40 CFR 84.102 is analogous to the definition of disposal in 40 CFR part 82, subpart F at 40 CFR 82.152, the safe disposal provisions also found subpart F at 40 CFR 82.155, as 82.155 does not contain a separate definition of ''disposal.'' To the extent this comment relates to the requirements of or suggestions to change 82.155 or any other regulations under CAA title VI, it is outside the scope of this rulemaking and requires no further response.

EPA disagrees that parts 4 and 5 of the proposed definition (see at 88 FR 72216, 72298, October 19, 2023) are incorrectly conflated. Recycling and disassembly for reuse are distinct processes under these regulations, but they are both end-of-life practices for refrigerant-containing equipment. The definition is intended to include a range of end-of-life practices to ensure the requirements cover the range of relevant activities. The commenter has not provided sufficient rationale for why the relevant requirements under this subpart should not apply to both disassembly and recycling. Accordingly, the Agency is retaining both 4 and 5 in the definition as it relates to refrigerant-containing equipment.

The definitions of recycle and disposal under RCRA are outside the scope of this rulemaking under subsection (h) of the AIM Act and this

action to establish the definitions that will apply for the regulations implementing that provision. For information on public comments on the proposed RCRA alternative standards, and EPA's responses, please see *RCRA Alternative Standards for Ignitable Spent Refrigerants: Response to Comments Document,* available in the docket.

Equipment. EPA proposed this definition to mean "any device that contains, uses, detects or is otherwise connected or associated with a regulated substance or substitute for a regulated substance, including any refrigerant-containing appliance, component, or system."

EPA is modifying its definition of equipment to specify that fire suppression equipment is also included under the definition of equipment. This revision is intended to clarify the definition by providing another illustrative example of equipment that is included in the definition. EPA does not view this list of examples as being exhaustive, however as it would be unnecessarily cumbersome to list all of the equipment that is included in the regulatory definition. For example, while not expressly listed in the definition. EPA also understands this definition to include direct and indirect ALD systems, including point detection systems, are a subset of equipment because ALD systems are devices that detect regulated substances or substitutes for regulated substances. EPA also added the word "to" after the word "connected" to maintain consistency with other definitions that use the phrase "connected to."

Fire suppression equipment. EPA's proposed definition of this term (see 88 FR 72216, 72298, October 19, 2023) described what would be included in the definition and also stated, among other things, that the term would not include mission-critical military end uses and systems used in deployable and expeditionary situations. EPA is modifying the final definition by replacing the phrase "mission-critical military end uses and systems" with "military equipment" to provide greater clarity on situations in which military equipment are exempt from certain provisions of the rule. As discussed later in this section, EPA is amending the definition of refrigerant-containing equipment in the same manner.

EPA intended the proposed definition to clarify that certain military equipment would not be subject to regulatory requirements in certain situations. The reference to "mission-critical military end uses and systems" was intended to be analogous to the use of the similar term "mission-critical military end uses" in 40 CFR 84.13(a). After further reflection and consideration of the comments submitted, the Agency has concluded that it would be clearer to separately address the exemption for mission-critical military end uses, and that this approach would better align with how these end-uses are treated under other provisions of the AIM Act. Accordingly, as noted in section I.B, EPA is also establishing an exemption from the ER&R regulations for mission-critical military end uses, as listed at 40 CFR 84.13(a), for a year or years for which the application receives an application-specific allowance as defined at 40 CFR 84.3. This approach mirrors the approach in regulations established under the 2023 Technology Transitions Rule at 84.56(a)(2) and better aligns with the regulations under 84.13. Given the addition of this exemption to the regulations finalized in this rule (see 84.114(b)), there is no need to exclude mission-critical military end uses from the definition of fire suppression equipment. With respect to military systems used in deployable and expeditionary situations, as stated in the proposal, there are situations in which the unique design and use of this equipment makes it impossible to recover fire suppression agents during the service, repair, disposal, or installation of such equipment. Because this rule does not define "end uses" or "systems," EPA is using the broader term "equipment" to improve understanding and clarify its intent that no military equipment used in deployable and expeditionary situations is subject to the regulations for fire suppression equipment in this rule.

Comment: One commenter requested that EPA exclude individual fire extinguishers from the definition of "fire suppression equipment." Another commenter supported exempting mission-critical military end uses from certain requirements of the rule. This commenter suggested that EPA could improve the clarity of the rule by stating that specific requirements (*e.g.,* leak repair, ALD systems) do not apply to mission-critical end uses and systems, rather than embedding the exemption in the definitions of "refrigerant-containing equipment" and "fire suppression equipment." The commenter further stated that affirmatively stating that certain requirements do not apply to mission-critical military end uses would make this rule consistent with the Allocation Framework Rule and would help improve compliance with this final rule.

Response: EPA disagrees with the commenter's request to exclude individual fire extinguishers from the definition of fire suppression equipment. EPA has a long history under the CAA title VI regulations of considering fire suppression as both streaming (*e.g.,* fire extinguishers) and total flooding applications. The commenter did not provide sufficient rationale for changing that approach in this rule and EPA is concerned that doing so would limit the ability of this rule to achieve its intended purpose with respect to minimizing releases from fire suppression equipment.

In response to the comment suggesting that EPA exempt mission-critical military end uses from certain requirements of the rule separate from the definition, as described above, EPA notes, that it has created a separate exemption in these regulations for mission-critical military end uses, as listed at 40 CFR 84.13(a), for a year or years for which that application receives an application-specific allowance as defined at 40 CFR 84.3. As explained above, EPA is taking this approach, rather than listing the exemption in each specific requirement, as that approach better aligns with the approach under other AIM Act rules, which should ease understanding of the exemption and facilitate implementation and compliance.

Industrial process refrigeration. EPA is finalizing this term as proposed to mean "complex, customized, refrigerant-containing appliances that are directly linked to the processes used in, for example, the chemical, pharmaceutical, petrochemical, and manufacturing industries. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks. Where one appliance is used for both industrial process refrigeration and other applications, it will be considered industrial process refrigeration equipment if 50 percent or more of its operating capacity is used for industrial process refrigeration."

Comment: One commenter stated that in the Technology Transitions program, EPA determined appliances that cool data centers, information technology equipment facilities (ITEFs), computer room cooling equipment, communications rooms, and appliances associated with cooling other spaces dedicated to maintaining the operating temperatures of electronic devices were not IPR or comfort cooling. The commenter further stated that under 40 CFR part 82, subpart F these refrigerant-containing devices are comfort cooling. The commenter requested that EPA

specify whether these appliances are comfort cooling or IPR. The commenter stated that all industrial facilities have data centers or computer rooms and need to understand how to properly sort their appliances because this impacts leak rate repair triggers and appliance repair time.

Response: The commenter is correct that the definition of ''comfort cooling'' in 40 CFR part 82, subpart F codified at 40 CFR 82.152 includes appliances that cool data centers, ITEF, computer rooms, communications rooms, and electronic devices. EPA intends for its definition of ''industrial process refrigeration'' under these regulations to parallel the definition within 40 CFR 82.152 as many of these requirements established for industrial process refrigeration and comfort cooling in this rule are analogous to those that apply under 40 CFR part 82, subpart F and EPA anticipates that using parallel definitions will facilitate understanding of the rule's requirements amongst regulated entities and support compliance for those entities that already have established approaches to complying with similar requirements for similar equipment under subpart F. Accordingly, the appliances that cool data centers, ITEF, computer room cooling equipment, communications rooms, and appliances associated with cooling other spaces dedicated to maintaining the operating temperatures of electronic devices are considered comfort cooling for purposes of the ER&R program established in this rule.

Installation. EPA is finalizing this term as proposed to mean ''the process of setting up equipment for use, which may include steps such as completing the refrigerant circuit, including charging equipment with a regulated substance or substitute for a regulated substance, or connecting cylinders containing a regulated substance or a substitute for a regulated substance to a total flooding fire suppression system, such that the equipment can function and is ready for use for its intended purpose.''

The definition of ''installation'' for purposes of the ER&R program is broader than a definition for a similar term used in the Technology Transitions program, which is found in 40 CFR part 84, subpart B. Specifically, the definition for ''install'' in subpart B refers only to the completion of a field-assembled system's circuit. ''Installation'' in this rulemaking under subsection (h) includes processes, practices and activities related to installation of equipment that are encompassed in the Technology Transitions program's definitions for both ''installation'' and ''manufacture'' at 40 CFR 84.52, as well as other types of installation. EPA is establishing a broader definition under subsection (h) to encompass the full range of practices, processes, or activities that are relevant to the installation of equipment that is regulated under this action, or that may be regulated under a future rule under subsection (h). Included under this definition of installation is the process of setting up of ALD systems for use, because ALD systems are considered equipment under this subpart.

Comment: One commenter stated that the activity of installation is commonly understood to relate to physically placing equipment in a facility or location, not to the initial charging of equipment during manufacture nor the field charging of refrigeration systems during construction. The commenter further maintained that read together, the terms that Congress used in subsection (h)(1) (''servicing, repair, disposal, or installation of equipment'') naturally refer to work performed on the equipment, not to the design of the equipment or the choice of which refrigerant is used in the equipment. The commenter asserted that if Congress had intended for EPA to have the ability to mandate what type of refrigerant is used in the equipment, it would more naturally have listed installation first in the serialization of activities, because installation is the first activity in the temporal sequence, followed by servicing and repair, and ultimately disposal of the equipment at end of life (EOL).

Another commenter stated that subsection (h)(1) contained limited authority regarding servicing, repair, disposal, and installation of equipment, and that the scope of any EPA regulations to implement subsection (h)(1) must remain within these parameters. The commenter further stated that subsection (h) does not contain any provision concerning the ''initial'' charging of equipment prior to sale or distribution—nor is there any specific mention in the statute of any subsequent charging of existing equipment. The commenter also stated that ''servicing'' was not defined in the proposed rule and that EPA has not clarified what constitutes ''servicing'' of existing equipment, although, charging of existing equipment could constitute ''servicing.''

Response: EPA disagrees with commenters that the term ''installation'' as used in context in subsection (h)(1) of the AIM Act does not include the addition of refrigerant to an appliance. Read in context, in relevant part, subsection (h) directs EPA to establish regulations to ''control, where appropriate, any practice, process, or activity regarding the . . . installation of equipment . . . that involves'' an HFC or a substitute for an HFC or the reclaiming of an HFC or a substitute for an HFC used as a refrigerant. The commenter's overly narrow interpretation is not the best reading of this provision. For example, it does not account for the full range of practices, processes, or activities that are involved in installation of equipment, and it does not recognize the scope of discretion that subsection (h)(1) conveys to EPA. In directing EPA to regulate ''any practice, process, or activity regarding the . . . installation of equipment'' ''where appropriate'' Congress afforded EPA discretion to determine what control measures are appropriate for particular practices, processes, and activities, and also to reach practices, processes, and activities that regard—or relate to—installation, rather than limiting EPA to only addressing practices, processes, and activities that occur directly during the placement of equipment on the site. Thus, EPA interprets this provision to convey regulatory authority that extends to a range of practices, processes, or activities regarding installation, and that includes activities both before and after placement on the site. From a technical perspective, an important part of installation of equipment is to prepare it for use, and adding refrigerant to refrigerant-containing equipment is a critical step in preparing the equipment for use, as the equipment cannot serve its intended use until it has been charged. Thus, charging is part of installation, and activities related to charging of equipment are related to the installation process and within this grant of authority under subsection (h)(1) concerning practices, processes, or activities regarding installation. Based on this interpretation of the statutory text, EPA is including the charging of equipment in the definition of ''installation'' in these regulations implementing subsection (h)(1). EPA agrees with the commenters to the extent that they assert that the terms that Congress used in subsection (h)(1) (''servicing, repair, disposal, or installation of equipment'') include work performed on the equipment, but for the reasons explained earlier in this response, EPA disagrees that the regulatory authority under subsection (h)(1) is limited to work performed directly on equipment. EPA disagrees with one commenter's suggested definition of ''installation'' as it would end at mere placement of the equipment on site and exclude work performed to

allow the system to function. Given that the text of subsection (h)(1) of the AIM Act expressly provides that the regulations established are to address practices, processes, or activities regarding the installation of equipment ''that involves a regulated substance or a substitute for a regulated substance,'' EPA concludes it is not appropriate to create a definition that focuses solely on work on the equipment and excludes work that plainly ''involves'' an HFC or substitute for an HFC, such as charging equipment. Further the Agency does not ascribe the same meaning to the sequencing of the terms as one of the commenters does, and the commenter's interpretation is not the best reading of the statutory text as it could eliminate many aspects of installation without any indication that Congress intended for the term to be so limited. Further, there could be other reasons that Congress put ''installation'' at the end of the sequence. For example, Congress may have been aware of mirroring similar provisions in CAA section 608, such as section 608(a)(1) and (2), which convey authority to establish regulations related to the ''service, repair, or disposal of appliances and industrial process refrigeration.'' Congress may have added ''installation'' at the end of the sequence because it was an addition to the terms that were included in section 608. Accordingly, EPA does not agree that either the interpretation of the statutory term ''installation'' or the definition of the term in the implementation of the statutory text through the regulations should be as limited as commenters suggest.

EPA disagrees with the comment that EPA define ''servicing'' in this final rule. EPA did not propose to do so, in part because it expected that the term would be understood by the regulated community without a definition, based in part on its experience with the regulations under CAA section 608, which addresses servicing of appliances without defining the term, and to EPA's knowledge, that lack of a definition has not hindered implementation of those regulations. EPA interprets installation and servicing to have distinct meanings under subsection (h)(1), as each is listed separately. However, EPA understands that adding refrigerant to existing equipment may also be part of servicing that equipment and does not intend for the inclusion of charging equipment in the regulatory definition of installation to suggest that adding refrigerant to equipment would only occur during installation, but simply that it may occur as part of installation. While EPA is not establishing a definition of servicing in this rule, it notes that other examples of servicing may include, but are not limited to, activities that involve the opening of the refrigerant loop, such as charging equipment, replacing component parts, or checking for leaks.

EPA discusses its authority for the requirements finalized in this rule regarding installation and servicing of equipment in greater detail in the relevant sections below.

MVAC-like appliance. EPA proposed this term to mean ''a mechanical vapor compression, open-drive compressor refrigerant-containing appliance with a full charge of 20 pounds or less of refrigerant used to cool the driver's or passenger's compartment of off-road vehicles or equipment. This includes, but is not limited to, the air-conditioning equipment found on agricultural or construction vehicles. This definition is intended to have the same meaning as defined in 40 CFR 82.152.''

EPA is modifying its proposed definition of ''MVAC-like appliance'' by deleting the first instance of the phrase ''or equipment'' and changing the second instance of ''or equipment'' with ''or appliances.'' EPA deleted the first instance of the phrase ''or equipment'' from the definition because the use of the term ''equipment'' in this instance does not align with the definition of ''equipment'' as defined in this rulemaking. This deletion is intended to clarify the intent of the definition, as the use of ''equipment'' in this context of ''off-road vehicles or equipment'' could have been confusing because it is not being used in the sense of how the term ''equipment'' is defined in these regulations. Regarding the second instance of ''air conditioning equipment'' EPA changed this language to ''air conditioning appliances'' to better align the types of devices that the definition of the term ''MVAC-like appliance'' covers under 40 CFR 82.152 with the types of devices covered under this rulemaking. EPA also removed the word ''defined'' from the definition to maintain consistency with the definition of ''motor vehicle air conditioners.'' EPA still intends the definition to have the same meaning as in 40 CFR 82.152.

Recover. EPA proposed this term to mean ''the process by which a regulated substance, or where applicable, a substitute for a regulated substance, is removed, in any condition, from equipment; and stored in an external container, with or without testing or processing the regulated substance or substitute for a regulated substance.''

EPA is modifying its definition of ''recover'' by putting the number ''(1)'' before the phrase: ''removed, in any condition, from equipment and'' and the number ''(2)'' before the phrase ''stored in an external container, with or without testing or processing the regulated substance or substitute for a regulated substance.'' EPA made this edit to clarify the text and to more closely align its definition of ''recover'' with the corresponding definition in the Act, though the AIM Act separates these two phrases with the letters ''(A)'' and ''(B)'' instead of ''(1)'' and ''(2).''

The term ''recover'' is defined in the AIM Act at subsection (b)(10) as ''the process by which a regulated substance is (A) removed, in any condition, from equipment; and (B) stored in an external container, with or without testing or processing the regulated substance.'' EPA proposed to extend the regulatory definition in these regulations to include ''where applicable, substitutes for regulated substances'' to support implementation of subsection (h)(1), which authorizes certain regulations involving substitutes for regulated substitutes. Substitutes for regulated substances are used in the same applications and often the same equipment as the regulated substances that they are being used in place of. Thus, recovering a substitute for a regulated substance would also occur, as appropriate, during the servicing, repair, or disposal of equipment and could be addressed by regulations under subsection (h)(1).

Comment: One commenter stated that the term ''recover'' is insufficiently defined under the AIM Act and indicated that this could lead to a loophole where virgin HFCs are placed into equipment for only a short amount of time and then labeled as recovered. Another commenter stated that EPA should consider recovered refrigerant as refrigerant ''installed in equipment for the purpose of operating the equipment for an extended amount of time.''

Response: EPA responds that, as noted above, subsection (b)(10) of the AIM Act defines ''recover'' as ''the process by which a regulated substance is (A) removed, in any condition, from equipment; and (B) stored in an external container, with or without testing or processing the regulated substance.'' This definition is similar to the same term as defined in 40 CFR 82.152, which defines ''recover'' to mean ''to remove refrigerant in any condition from an appliance and to store it in an external container without necessarily testing or processing it in any way.'' While charging a regulated substance into a piece of equipment and then recovering it without allowing it to be used for its intended purpose could be

a loophole, EPA has not encountered confusion around this term under the CAA regulations at 40 CFR 82.152, and the commenters did not provide sufficient rationale to change this aspect of the statutorily defined term in this regulation.

The Agency however takes note of the scenario the commenter provided as a potential means for circumventing the requirements and views such an approach as inconsistent with the intent of the definition. Moreover, EPA is establishing a definition of ''virgin regulated substance'' in this rulemaking to make it clear that introduction of a regulated substance to equipment, such as a refrigerant-containing appliance or fire suppression equipment, solely or primarily to convert or attempt to convert its status to a ''used'' regulated substance and circumvent the intended requirements of this rule is not permissible. A regulated substance that has had no bona fide use in equipment (as described in the definition for ''virgin regulated substance'') would still be considered a virgin regulated substance.

Refrigerant. EPA proposed this term to mean, ''for purposes of this subpart, any substance, including blends and mixtures, consisting in part or whole of a regulated substance or a substitute for a regulated substance that is used for heat transfer purposes, including those that provide a cooling effect.''

After considering comments, EPA is modifying the final definition by replacing the phrase ''including those that provide a cooling effect'' with the phrase ''and provides a cooling effect.'' This change aligns with the definition of ''refrigerant'' in 40 CFR 82.152 and will maintain a consistent understanding of the term in the ER&R program and in the regulations under section 608 of the CAA. EPA is also removing the phrase ''for the purposes of this subpart'' from this definition for reasons stated in section IV.A.1 of this preamble.

Comment: One commenter asked whether heat transfer fluids that do not provide a cooling effect are regulated under this rule. The commenter stated that EPA's proposed definition could include heat transfer fluids that do not provide a cooling effect, including fluorinated heat transfer fluids (F–HTFs). The commenter indicated that this was likely not EPA's intention, citing EPA's rulemaking 69 FR at 11946, 11957 (March 12, 2004), which excluded heat transfer fluids that do not provide a cooling effect. The commenter further stated that F–HTFs have never been used as a substitute for ODS, unlike regulated substances that provide a cooling effect. The commenter provided the following alternative definition: ''Refrigerant, for purposes of this subpart, means any gaseous substance, including blends and mixtures, consisting in part of or whole of a regulated substance or a substitute for a regulated substance that is used in a heat cycle, and reversibly undergoes a phase change from a gas to a liquid, to provide a cooling effect.''

Response: EPA acknowledges the commenter's suggestion for an alternative definition for the term refrigerant and in response agrees with the commenter that F–HTFs that do not circulate through the compressor of a system are not considered refrigerants for the purposes of this rule. EPA has historically treated these fluids separately from refrigerants. However, EPA notes that subsection (h)(1) of the AIM Act is not limited to refrigerants but rather ''equipment . . . that involves a regulated substance, or a substitute for a regulated substance.'' This rule includes HFCs used as fire suppression agents in fire suppression equipment and in a later rulemaking action could include HFCs used as heat transfer fluids. Furthermore, the commenter's alternative definition only covers vapor compression systems and not alternative types of refrigeration systems such as non-mechanical heat-transfer with a circulating cooler or a thermosiphon, which EPA has included as an end-use under SNAP. For those reasons, rather than adopting the commenters' suggested definition, EPA is modifying the proposed definition as described above to clarify that heat transfer fluids that do not provide a cooling effect are not included in the definition of ''refrigerant'' established in this rule.

Refrigerant-containing appliance. EPA proposed this term to mean ''any device that contains and uses a regulated substance or substitute for a regulated substance as a refrigerant including any air conditioner, motor vehicle air conditioner, refrigerator, chiller, or freezer. For a system with multiple circuits, each independent circuit is considered a separate appliance.''

After considering comments, EPA is modifying the final definition. First, EPA is removing the phrase ''motor vehicle air conditioner'' and replacing it with its abbreviation ''MVAC'' to maintain consistency with other definitions where the term ''motor vehicle air conditioner(s)'' is abbreviated. After the term ''MVAC,'' EPA is also adding the word ''MVAC-like appliance'' to provide another example of a refrigerant-containing appliance. Second, EPA is replacing the phrase ''a system with multiple circuits'' to ''such devices with multiple circuits.'' This edit is intended to increase clarity, as the term ''device'' is used in the last sentence to maintain a parallel sentence structure with the first sentence of the definition, which uses the term ''any device.'' The final definition also adds ''including but not limited to,'' to clarify that air conditioners, refrigerators, chillers, and freezers are intended as illustrative examples, but is not an exhaustive list of all possible devices that meet the definition of refrigerant-containing appliances under this subpart. EPA further notes that a refrigerant-containing appliance could be of any size and include residential, commercial, or industrial appliances.

As the term ''refrigerant-containing appliance'' is not a defined term under the AIM Act, and as the Agency is establishing certain regulatory requirements that apply only to refrigerant-containing appliances in this rule, the regulatory definition is designed to provide clarity as to what types of equipment are subject to those requirements. EPA intends this term to be a subset of the broader category of ''refrigerant-containing equipment'' which is also defined in this rule as discussed below, and EPA understands that any exclusions from the definition of ''refrigerant-containing equipment'' would necessarily also apply to refrigerant-containing appliances. EPA notes that this definition differs from the definition of a similar term, ''appliance,'' under CAA section 608. CAA sections 601 and 608 specified that an appliance ''is used for household or commercial purposes,'' and that phrase also appears in the definition of ''appliance'' in 40 CFR 82.152. The AIM Act has no analogous provision; rather subsection (h) focuses more broadly on ''equipment.'' Accordingly, EPA is not including that phrase in defining ''refrigerant-containing appliance'' for purposes of implementing subsection (h). Similar to EPA's approach to similar equipment under the application of title VI of the CAA (*e.g.,* under sections CAA sections 608 and 612), EPA is defining a ''refrigerant-containing appliance'' to consist of an independent circuit. The independent circuit provides the desired cooling effect, typically consisting of a compressor, condenser, evaporator, and metering device in an enclosed refrigerant loop. EPA notes that a given piece refrigerant-containing equipment could contain multiple independent circuits and thus be considered as multiple, separate ''refrigerant-containing appliances.'' For

instance, some food retail cases have been made with multiple independent circuits, each one containing the maximum 150-gram charge limit of propane, thus allowing a single case to address a higher refrigeration load.

Comment: One commenter recommended that EPA define each independent closed loop circuit as a separate appliance, citing confusion caused by different usage of the term ''appliance'' by the industry.

Response: EPA agrees that each independent closed loop circuit is a separate appliance and has clarified the final definition, as described above.

Refrigerant-containing equipment. EPA proposed this term to mean ''equipment that contains, uses, or is otherwise connected or associated with a regulated substance or substitute for a regulated substance that is used as a refrigerant. This definition includes refrigerant-containing components, refrigerant-containing appliances, and MVAC-like appliances. This term does not include mission-critical military end uses and systems used in deployable and expeditionary situations. This term also does not include space vehicles as defined in 40 CFR 84.3.''

EPA is modifying the final definition by replacing the phrase ''mission-critical military end uses and systems'' with ''military equipment.'' EPA also added the word ''to'' after the word ''connected'' to maintain consistency with other definitions that use the phrase ''connected to.'' Finally, EPA is removing the phrase ''MVAC-like appliances'' from the definition because ''MVAC-like appliances'' are examples of refrigeration-containing appliances. As such, keeping the term in the definition would be extraneous.

As finalized, this definition of ''refrigerant-containing equipment'' does not include military equipment used in deployable and expeditionary applications, nor does it include space vehicles. These exclusions are based on EPA's understanding that there are situations in which the unique design and use of military equipment used in deployable and expeditionary situations and space vehicles make it impossible to recover refrigerant during the service, repair, disposal, or installation of the equipment. Likewise, requiring adherence to the leak repair requirements and other provisions for refrigerant-containing equipment in this rulemaking in an active military zone of engagement, including military systems used in deployable and expeditionary situations, could lessen the military effectiveness of the equipment. Similarly, the exclusion for space vehicles is based on EPA's understanding that requiring leak repair and other provisions in this rulemaking for such equipment could lessen their effectiveness. EPA notes that an identical exclusion for military equipment and space vehicles was made in the finalized definition of ''fire suppression equipment.'' Further, as noted in section I.B and-explained in greater detail in the discussion of the definition for ''fire suppression equipment'' above, while EPA replaced the phrase ''mission-critical military end uses and systems'' with ''military equipment'' in this definition, this final rule also includes a separate exemption from the ER&R regulations for mission-critical military end uses (as listed at 40 CFR 84.13(a)), for a year or years for which the application receives an application-specific allowance as defined at 40 CFR 84.3.

Comment: One commenter stated that the proposed rule creates confusion by having separate definitions for equipment, refrigerant-containing appliance, and refrigerant-containing equipment. The commenter stated that EPA's definition of ''refrigerant-containing appliance'' would have been sufficient for all the instances in which ''equipment'' or ''refrigerant-containing equipment'' were used, and that EPA should only finalize a definition for ''refrigerant-containing appliance,'' and rename it ''refrigerant-containing equipment'' to be consistent with subsection (h) of the AIM Act.

Response: EPA disagrees with this comment, as the terms ''equipment,'' ''refrigerant-containing equipment,'' and ''refrigerant-containing appliance'' are not used interchangeably in the rule. Rather, these three definitions are intended to have distinct meanings. For example, ''refrigerant-containing equipment'' is a broader category that includes applications that are not covered under ''refrigerant-containing appliance.'' For example, ''refrigerant-containing equipment'' includes refrigerant-containing components, whereas the definition of ''refrigerant-containing appliance'' does not. ''Equipment'' is an even broader category that includes both equipment that does and equipment that does not contain refrigerant. For example, fire suppression equipment is included in the definition of equipment but not the definition of ''refrigerant-containing equipment.'' Different requirements apply to different types of equipment under the regulations established in this *final rule.* Given these distinctions, EPA is retaining all three of these definitions in the final rule.

Repair. EPA proposed this term to mean, ''for purposes of this subpart and as it relates to a particular leak in a refrigerant-containing appliance, to mean making adjustments or other alterations to that refrigerant-containing appliance that have the effect of stopping leakage of refrigerant from that particular leak.''

EPA is modifying this term by removing the phrase ''for the purposes of this subpart'' from this definition for reasons stated in section IV.A.1 of this preamble.

Comment: One commenter expressed support for EPA's proposed definition of repair and the discussion of the purpose of repair in the preamble of the proposed rule.

Response: After considering comments, EPA is finalizing the definition of ''repair'' as proposed, though EPA is deleting the phrase ''for purposes of this subpart'' from the definition.

Retrofit. EPA proposed this definition, as it relates to a refrigerant-containing appliance, to mean ''to convert an appliance from one refrigerant to another refrigerant. Retrofitting includes the conversion of the appliance to achieve system compatibility with the new refrigerant and may include, but is not limited to, changes in lubricants, gaskets, filters, driers, valves, o-rings, or appliance components. Retrofits required under this subpart shall be done to a refrigerant with a lower-GWP.''

EPA is modifying the final definition by removing the last sentence requiring that retrofits be done with a refrigerant with a lower-GWP. The proposed definition was meant to prevent the retrofit of refrigerant-containing appliances to a higher-GWP refrigerant as a compliance option. EPA decided in this final rule to not require the retrofit of an appliance to a lower-GWP refrigerant. The Agency acknowledges that there are situations where retrofitting to a lower-GWP refrigerant may not be feasible, such as when there is an inadequate supply of lower-GWP refrigerant or when technical standards do not allow the retrofit from a non-flammable refrigerant to a flammable refrigerant. Some appliances may have a limited number of lower-GWP alternatives, making it more difficult to retrofit a system to meet leak repair requirements. While the owner of a refrigerant-containing appliance has other ways to meet leak repair requirements, such as sufficiently repairing leaks or retiring the system, EPA does not want to limit the number of compliance options by prohibiting the retrofit of an appliance to a higher-GWP refrigerant. EPA emphasizes that it still encourages the retrofit of systems to

lower-GWP refrigerants whenever possible.

Comment: A few commenters were opposed to a requirement that retrofits always be to a refrigerant with a lower-GWP. One commenter stated that requiring retrofits to only lower-GWP refrigerants would produce logistical challenges, create supply constraints, and increase costs. Another commenter stated that EPA should avoid discouraging retrofits from refrigerants like R–22, R–404A, and R–507A to lower-GWP alternatives that still exceed the GWP limits in the 2023 Technology Transitions Rule (R–448, R–449, R–427, R–407H, and R–407A for commercial and industrial). The commenter stated that transitioning from R–404A to lower-GWP options will benefit the HFC phasedown. One commenter supported EPA retaining its definition to require retrofits to low-GWP refrigerants and stated that requiring retrofit plans to use lower-GWP refrigerants is consistent with the phasedown and the intent of the AIM Act and may help mitigate ongoing leakage that may occur after the retrofit is completed.

Response: EPA acknowledges these comments both supporting and opposing the proposed definition. After consideration of these comments, for the reasons discussed above in describing the modifications to the proposed definition in the final definition, EPA is not requiring that retrofits use lower-GWP refrigerants in this final rule. As noted above, while not requiring it, EPA encourages the retrofit of refrigerant-containing appliances to lower-GWP refrigerants whenever possible. With respect to the comments related to the restrictions established in the 2023 Technology Transitions Rule, EPA notes that rule did not address retrofits and that rule applies only to new systems (including for refrigerant-containing appliances). Additionally, with respect to the comment that requiring retrofits to lower-GWP refrigerants may help mitigate ongoing leakage after the retrofit is complete, EPA notes that 40 CFR 84.106(h)(4) requires that all leaks be repaired as part of any retrofit plan, which should also ameliorate concerns about ongoing leakage related to the retrofit. Regarding the intent of the Act, the commenter did not provide any rationale to support the position that the intent of the AIM Act was to require retrofits to use lower-GWP refrigerants. EPA further notes that the AIM Act does not expressly address whether a lower-GWP refrigerant should be used for retrofits, and for the reasons explained above, EPA has decided not to establish that requirement in this rule.

Substitute for a regulated substance. EPA is finalizing this definition as proposed to mean ''a substance that can be used in equipment in the same or similar applications as a regulated substance, to serve the same or a similar purpose, including but not limited to a substance used as a refrigerant in a refrigerant-containing appliance or as a fire suppressant in fire suppression equipment, provided that the substance is not a regulated substance or an ozone-depleting substance.''

Subsection (h)(1) expressly authorized EPA to promulgate certain regulations involving a regulated substance, a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant. EPA is defining ''substitute for a regulated substance'' in this subpart for additional clarity that the use of this term in subsection (h) and in the regulations established in this rule differs from how the term ''substitute'' is used in subsection (i) and defined in 40 CFR part 84, subpart B.[48] The definition under subsection (h) makes clear that substitutes do not include HFCs or ODS and are instead a different category of substances. Examples of a substitute for a regulated substance that are encompassed by this definition under subsection (h) include but are not limited to HFOs, hydrocarbons (*e.g.,* propane, isobutane), ammonia (NH_4), and CO_2. A substitute for a regulated substance may be used neat or in a blend. However, a blend that contains a regulated substance is subject to the requirements that apply under this rule to regulated substances because those requirements apply to regulated substances regardless of whether the regulated substance is used neat or in a blend, as described above in section II.B of this preamble.

This distinction between substitutes and regulated substances for purposes of these regulations is also helpful for implementing certain provisions of this rulemaking that apply differently to regulated substances than to substitutes for regulated substances. For instance, the leak repair requirements apply to all regulated substances but only apply to substitutes for a regulated substance with a GWP greater than 53.

As noted in the Executive Summary of this preamble at section I.A, the terms ''HFC'' and ''regulated substance'' are used interchangeably in this preamble. Similarly, the term ''substitute for an HFC'' may be used interchangeably with ''substitute for a regulated substance'' in this preamble.

Comment: One commenter requested further clarification of the definition. The commenter stated that the definition of ''regulated substance'' in 40 CFR 84.106(a)(1) is easy to understand unlike the definition in 40 CFR 84.106(a)(2). The commenter highlighted the complexity of determining the GWP of a substitute for a regulated substance, because the proposed methodology involved consulting three separate references that may vary in accessibility. The commenter requested that EPA provide a list of all substitutes for regulated substances with a GWP greater than 53, and that the Agency should not list substitutes for regulated substances with a GWP of less than 53, as doing so contributes to confusion.

Response: EPA responds that to the extent the commenter read the proposed regulations at 40 CFR 84.106(a)(1) and (2) as definitions, that interpretation misunderstands the intent of those provisions, which are designed to describe the applicability of the requirements in 40 CFR 84.106, not provide general definitions. To the extent the commenter intended to request the addition of definitions, EPA responds that subsection (c)(1) of the AIM Act lists regulated substances for the purpose of this and other rulemakings under the AIM Act, such as the Allocation Framework Rule (86 FR 55116, October 5, 2021) and the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023). The term ''regulated substance'' is defined in part 84, subpart A (40 CFR 84.3), with a current list provided in appendix A to part 84, and this appendix applies to the whole of part 84, including subpart C. Accordingly, EPA concludes it is not necessary to again list the regulated substances with a GWP greater than 53 in this action. While subsection (c)(3)(A) of the AIM Act authorizes the Administrator to designate as a regulated substance a substance that is not included in the list in subsection (c)(1) if certain criteria are met, EPA did

[48] The definition for *substitute* in the 2023 Technology Transitions Rule is: ''any substance, blend, or alternative manufacturing process, whether existing or new, that may be used, or is intended for use, in a sector or subsector with a restriction on the use of regulated substances and that has a lower global warming potential than the GWP limit or restricted list of regulated substances and blends in that sector or subsector.'' Under this definition, substitutes include regulated substances (*e.g.,* HFC–32 used in lieu of R–410A in commercial unitary AC), blends containing regulated substances (*e.g.,* R–454B used in lieu of R–410A in residential unitary AC), blends that do not use a regulated substance (*e.g.,* R–441A used in lieu of R–410A in window ACs), substances that are not HFCs (*e.g.,* HFOs, hydrocarbons, R–717, and R–744 (CO_2)), and not-in-kind technologies (*e.g.,* finger-pump bottles in lieu of aerosol cans, or vacuum panels in lieu of foam insulation). (See 88 FR 73098, 73110, October 24, 2023).

not propose to add any regulated substance to the statutory list, and is not finalizing any addition. To the extent the commenter opposes such a listing, EPA finds that concern is beyond the scope of this rulemaking and thus requires no further response.

In response to the commenter's statements about the complexity of consulting multiple sources to determine the GWP of a substitute for a regulated substance, EPA notes that as described in section IV.C.1 of this preamble, the Agency is not finalizing the methodology to determine GWP of a substitute for a regulated substance, as proposed. EPA is instead finalizing the provisions to use a list of GWPs for various substitutes for regulated substances codified in the 2023 Technology Transitions Rule at 40 CFR 84.64. EPA is taking this approach because it agrees that having these GWPs in one concise list will limit confusion and enhance accessibility.

Virgin regulated substance. EPA proposed this definition to mean ''any regulated substance that has not had any bona fide use in equipment except for those regulated substances contained in the heel or the residue of a container that has bona fide use in the servicing, repair, or installation of equipment.''

EPA is modifying the final definition by removing the phrase ''except for those regulated substances contained in the heel or the residue of a container that has bona fide use in the servicing, repair, or installation of equipment.''

EPA's proposed definition of ''virgin regulated substance'' excluded refrigerant heels because EPA wanted to include refrigerant heels recovered from a container as recovered material for purposes of meeting the reclamation standard. However, EPA concluded that refrigerant heels are best described as ''virgin regulated substances'' because refrigerant heels have not had a bona fide use in equipment. EPA still recognizes the value of recovered heels, and thus EPA is not counting refrigerant heels that are removed from containers to contribute towards the 15 percent virgin material limit discussed in section IV.E.1 of this preamble.

The final definition of ''virgin regulated substance'' makes it clear that the introduction of a regulated substance to equipment, such as a refrigerant-containing appliance or fire suppression equipment, solely to convert its status to a ''used'' regulated substance and circumvent the intended requirements of this rulemaking is not permissible. This scenario, where a regulated substance is charged into equipment and subsequently recovered without any bona fide use, was brought to EPA's attention by stakeholders including during public stakeholder meetings as the Agency developed this rulemaking.[49] This issue was also raised in public comments on the proposed rule, as indicated in the comments summarized immediately below. Under the definition finalized in this rule, a regulated substance that has had no bona fide use in equipment would be considered a virgin regulated substance.

Comment: One commenter stated it is arbitrary and capricious to limit the definition of ''virgin regulated substance'' to refrigerant without a ''bona fide use'' in equipment because EPA does not define ''bona fide use'' and offers a limited explanation of the term. While the commenter agreed that only refrigerant that was used in an appliance for its intended purpose should qualify as recovered refrigerant, the commenter stated that it is not clear who the compliance obligation to make this determination of ''bona fide use'' falls on. The commenter further stated that the heel or residue of a container should not by default be considered ''virgin'' on the basis that it had a bona fide use, but instead be categorized based on the nature of its origin.

Multiple commenters requested that EPA define ''bona fide use.'' One commenter stated that EPA should define a minimum length of time that refrigerant can be in equipment or some other objective criteria before it has had a ''bona fide use.'' Another commenter stated that the term ''bona fide use'' has never been used in any definition of reclaim or reclamation either under title VI of the CAA, the AIM Act, or under the Air-Conditioning, Heating, and Refrigeration Institute's (AHRI) 700 standard for reclamation, and that EPA provides no justification for using the term. Two commenters stated that it is unclear how EPA will determine whether refrigerant has had a ''bona fide use.'' One commenter claimed that not having a precise definition of ''bona fide use'' will undermine the refrigeration industry and lead to fraud, since entities could briefly pass refrigerant through chillers or other equipment and then remove it, process it, and send it out for ''AHRI 700 certification.'' Lastly, one commenter stated that it is necessary to specify the use conditions from which refrigerant can be recovered in order to consider them reclaimed. The commenter asserted this would help avoid the ''potential laundering of newly produced material into the reclamation market.''

A few commenters recommended that EPA distinguish between virgin refrigerant and recovered heel. One commenter requested that EPA define heel as ''the residual amount of any regulated substance in a disposable cylinder.'' The commenter stated that residual amounts of regulated substances left in a disposable cylinder that has not had a bona fide use in equipment should be considered a ''virgin regulated substance'' whereas any residual amounts left in a disposable cylinder that has had a bona fide use in servicing, repair, or installation should be considered a recoverable substance for reclaim. The commenter remarked that these definitions should only apply to disposable cylinders and not other types of containers, as those heels are properly accounted for as virgin gas. Another commenter suggested the recovered heel should be considered in the context of cylinders rather than containers to avoid gaming the system of recovering from larger containers. Two commenters asserted that EPA should define heel based on how the refrigerant was used or obtained, not on the type of container the refrigerant is in. A commenter gave an example of refrigerant left in an International Organization for Standardization tank or rail car. The commenter stated that under EPA's proposed definition of ''virgin regulated substance,'' all of the unused refrigerant in these containers would need to be considered a ''heel'' and have to be reclaimed even though the refrigerant would still have the properties of virgin refrigerant. Another commenter discussed the possibility of large quantities of refrigerant being sent to a reclaimer as ''bona fide heel'' and asked for clarification on whether a bona fide heel could include the entire contents of a container. One commenter requested that the words ''heel'' and ''residue'' both be defined as ''the vapor contents remaining in a container once the last drop of liquid has been removed.''

Response: EPA disagrees that limiting the definition of ''virgin regulated substances'' to refrigerant that has not had a ''bona fide use'' in equipment is arbitrary and capricious and, after considering the comments on this topic, is finalizing a definition of ''virgin regulated substance'' to mean ''any regulated substance that has not had any bona fide use in equipment.'' Commenters did not provide alternate definitions or approaches that would sufficiently address the concerns raised by commenters and stakeholders that

[49] EPA held stakeholder meetings for public input on November 9, 2022, and March 16, 2023, and also solicited feedback through a webinar for EPA's GreenChill Partnership program on April 12, 2023.

entities could briefly pass refrigerant through equipment and claim the refrigerant was recovered. After considering the public input on this issue, the Agency concludes that it is important to finalize a definition of ''virgin regulated substance'' that indicates that virgin refrigerant is refrigerant that has not had bona fide use in equipment to address these concerns and help ensure the integrity of the reclamation requirements. In response to the comment on compliance obligation, EPA notes there is no obligation to make a determination of bona fide use under the definition itself; however, the definition informs compliance with other regulatory obligations, and to determine the compliance obligation one would need to examine the relevant regulatory requirement.

While EPA is not finalizing a definition for ''bona fide use'' in this rule, the Agency notes that at a minimum, refrigerant that has had a ''bona fide use'' is refrigerant that has been used in equipment to transfer heat between materials and then recovered for the purposes of reclamation or disposal. It is EPA's position that there is no set amount of time that a refrigerant should be used in a system before it is considered to have had a ''bona fide use.'' Since there are a diverse range of applications in which refrigerants are used, and a variety of circumstances around that use, it is not appropriate to define a specific timeframe that applies for all refrigerants and applications. However, the amount of time refrigerant is used and other circumstances surrounding its use should together indicate that the use was for purposes of the equipment's maintenance or operation, rather than for the purpose of converting or attempting to convert the HFC's status to a ''used'' regulated substance and circumvent the requirements of this rule. Examples of ''bona fide use'' of refrigerant in equipment include, but are not limited to, refrigerant recovered from equipment once the refrigerant becomes contaminated, or refrigerant removed from an appliance due to changes in ambient conditions according to the provisions of seasonal variance in 40 CFR 82.152. Conversely, as indicated previously, passing a regulated substance through equipment and then recovering without an operational reason to do so (*e.g.,* without an indication of contamination or equipment malfunction), for the purpose of this treating the regulated substance as used, would not be considered bona fide use under this definition.''

Even assuming the comments that the term ''bona fide use'' has not been used previously in other rulemakings or regulatory texts under CAA title VI or the AIM Act is true, EPA does not believe that is a reason to not use the term here. EPA's justification for using the term is to differentiate ''virgin regulated substances'' from those substances that have been used in equipment for their intended purposes and should no longer be considered virgin refrigerant. Some commenters expressed concern with the definition of recovery because there is the potential that virgin regulated substances would be charged into equipment or appliances and then recovered in an attempt to circumvent regulatory requirements established under this rule. EPA responds that the Agency considers the definition of ''virgin regulated substance'' for the purposes of these regulations under subsection (h) to address those concerns and reiterates that adding refrigerant to an appliance for the purpose of recovering it shortly thereafter, and then considering it ''used'' is not considered ''bona fide use.''

EPA did not propose and is not establishing a definition for residue or establishing various definitions for heel based on different types of containers. While in the Economic Impact and Benefits TSD EPA estimates an average refrigerant heel at a specific percent of a container's nominal capacity, EPA acknowledges that there may be variations in the amount of HFCs that remain in a container.

The definition of ''heel'' in 40 CFR 84.3 to mean ''the amount of a regulated substance that remains in a container after it is discharged or off-loaded (that is no more than 10 percent of the volume of the container)'' applies to this rulemaking, as EPA is adopting definitions from 40 CFR part 84, subpart A for terms that are not separately defined in this rule. EPA clarifies that the heel could never be considered to include more than 10 percent of the container. EPA is not differentiating between refrigerant heels in different types of containers in this rulemaking to maximize the reclamation of refrigerant heel, except to clarify that the ten percent limit applies regardless of the type of container.

In response to comments about whether refrigerant should be classified by the nature of its origin, EPA notes that it is distinguishing refrigerant by its prior use, not the type of container it is in. As stated previously, refrigerant that has had bona fide use in equipment would be considered recovered material, whereas refrigerant that has not had a bona fide use in equipment would not be considered recovered. In response to the comment suggesting that EPA not specify that refrigerant heel or residue must include only vapor contents in this rulemaking, EPA has decided not to include such a specification, as the Agency understands that there may be situations where refrigerant heel is not entirely vapor, even if the amount of refrigerant heel remaining in the container is less than 10 percent of the container's volume.

3. What additional comments did EPA receive on definitions?

Some commenters suggested that EPA create defined terms that the Agency did not propose. Those terms are: reclaim, saturated hydrofluorocarbon, regulated substance, substitute, essential use, narrowed use limit, and technology transitions petition. For the reasons discussed in this section, EPA is not establishing definitions for these terms in this action.

Reclaim: Multiple commenters requested that EPA define ''reclaim'' or a phrase containing the word ''reclaim'' to improve the clarity of the rule. One commenter claimed that reclaimed refrigerant referred to in 40 CFR 84.112(e) may be refrigerant that either has ''not had bona fide use in equipment'' or recovered refrigerant (removed from equipment), and that these requirements are not interchangeable because recovered material could be virgin. The commenter asserted that EPA should clarify that reclaimed refrigerant must be non-virgin in origin. Another commenter suggested that EPA could consider instituting a policy in which the amount of material that can be sold by an entity as reclaimed cannot exceed material recovered. Another commenter suggested that EPA should define ''certified reclaimed refrigerant'' as ''used (recovered) refrigerant . . . from a previously operational appliance'' in line with the California Air Resources Board (CARB) definition.

Response: Subsection (b)(9) of the AIM Act provides a statutory definition for ''reclaim; reclamation.'' This definition refers to the reprocessing of a recovered regulated substance to meet at least the purity described in standard AHRI 700–2016 (or an appropriate successor standard adopted by the Administrator), and that the purity of the reclaimed regulated substances must be verified using, at a minimum, the analytical method described in that standard. EPA promulgated a definition

for ''reclaim'' in the Allocation Framework Rule (86 FR 55116, October 5, 2021) that is consistent with the definition provided by the AIM Act and that appears in 40 CFR 84.3. As provided in the regulations established in the final rule, for terms not defined in subpart C but that are defined in section 84.3, the definitions in section 84.3 shall apply, because the definition in 84.3 is also appropriate for the rule. EPA is not establishing a separate or different definition of ''reclaim'' in this action. This approach has the further benefit of providing consistency in the use of this term in this action with how it is used in other regulations implementing the AIM Act. Regarding the suggested definition of ''certified reclaimed refrigerant,'' EPA notes that CARB's definition of that term includes practices meant to ensure that reclaimed refrigerant meets certain standards (such as being from a previously operational appliance).[50] EPA is not finalizing a definition of ''certified reclaimed refrigerant,'' nor is EPA providing a definition specifying what standards reclaimed refrigerants have to meet beyond what is already required under the AIM Act. In provisions that appear outside of the definition section of the regulations established in this final rule, EPA is requiring that refrigerant contain no more than 15 percent virgin material as specified in the reclamation standard found in 40 CFR 84.112(a) and that reclaimed refrigerant must meet AHRI standards or other applicable purity specifications. Because these provisions address the standards that would apply for reclaimed refrigerant, EPA concludes that the definitions such as those suggested by the commenters are not necessary. As indicated by these requirements, to the extent that the comments suggest that reclaimed refrigerant cannot include any virgin HFCs, EPA disagrees. EPA further explains its reasons for allowing up to 15 percent virgin material in refrigerant that meets the reclamation standards established in the rule in section IV.E.1 of this preamble. EPA disagrees with the comment that a reclaimer should not be able to sell more reclaimed refrigerant than the amount of recovered refrigerant it received. Reclaimers often will hold recovered refrigerant until there is a sufficient quantity to process efficiently or until a change in market conditions. Therefore, the amount reported as reclaimed will not align with, and could potentially exceed, the amount reported as received.

Saturated hydrofluorocarbon: One commenter requested that EPA define ''saturated'' as it relates to a hydrofluorocarbon refrigerant and use that term throughout the rulemaking.

Response: EPA disagrees that there is a need to use or define the term ''saturated hydrofluorocarbon'' for purposes of this action. As described previously, subsection (c)(1) of the AIM Act lists 18 saturated HFCs, and by reference any of their isomers not so listed, that are covered by the statute's provisions, referred to as ''regulated substances.'' EPA is also authorized to designate additional substances that meet certain criteria as regulated substances and one of those criteria is that the substance must be a saturated HFC. Further, the term ''regulated substance'' is defined in part 84, subpart A (40 CFR 84.3), with a current list provided in Appendix A to part 84, and this appendix applies to all of part 84 including subpart C. EPA has also explained that it is using the terms HFC and regulated substances interchangeably in this action. These provisions make clear which HFCs are addressed by this action, obviating any need to define ''saturated'' by regulation or use the term ''saturated hydrofluorocarbon'' throughout the regulations established in this rule.

Comment: One commenter asserted that the rule should define the terms ''regulated substance,'' ''substitute,'' ''essential use,'' ''narrowed use limit,'' and ''technology transitions petition.'' The commenter stated that these terms are important to understand the scope and applicability of the HFC phasedown program, and not defining these terms could create confusion and inconsistency in interpreting the rule.

Response: The terms ''essential use,'' ''regulated substance,'' ''narrowed use limit,'' ''substitute,'' and ''technology transitions petition'' appear to be similar to or the same as terms used in other regulatory programs under the AIM Act or the CAA. For example, the terms ''essential use'' and ''regulated substance'' are defined under the Allowance Allocation program (40 CFR part 84, subpart A), ''narrowed use limit'' is defined under SNAP (40 CFR part 82, subpart G), and ''substitute'' and ''technology transitions petition'' are defined under the Technology Transitions program (40 CFR part 84, subpart B), respectively. The commenter has not explained what relevance such terms would have to this rulemaking and, with the exception of the term ''regulated substance'' which is used in the regulations finalized in this action, the connection is not apparent to EPA. With respect to the term ''regulated substance,'' as explained earlier in this section, because EPA is not defining that term separately in subpart C, the definition under 40 CFR 84.3 also applies in subpart C. No additional definition is needed. EPA further notes that while it is not establishing a definition for ''substitute'' in this rule, it is defining the term ''substitute for a regulated substance'' for purposes of the regulation, for the reasons discussed in section IV.A.2 of this preamble.

B. What types of equipment is EPA addressing under subsection (h)?

Subsection (h) of the AIM Act provides EPA authority to promulgate regulations to control, where appropriate, any practice, process, or activity related to the servicing, repair, disposal, or installation of equipment that involves HFCs or their substitutes, or the reclaiming of HFCs or their substitutes used as refrigerants. EPA interprets this provision to include authority to regulate, as appropriate, practices, processes, or activities related to any equipment that uses a regulated substance or a substitute for a regulated substance. Regulated substances and their substitutes are typically used in RACHP equipment as a refrigerant. Regulated substances and/or their substitutes may also be used in other types of equipment, such as equipment used in aerosols, fire suppression, solvent cleaning, foam blowing, and others. However, as explained in section II.B of this preamble, subsection (h)(4) of the AIM Act expressly provides that any rulemaking under subsection (h) shall not apply to a regulated substance or a substitute for a regulated substance that is contained in a foam. Thus, this rulemaking did not propose and is not finalizing any requirements for regulated substances or their substitutes when they are contained in foams. Accordingly, EPA interprets its authority under subsection (h) to include promulgating regulations that control the types of practices, processes, or activities identified in subsection (h)(1) in any of those sectors, subsectors, or applications, with the limitation that EPA does not interpret its regulatory authority under subsection (h) to extend to HFCs or substitutes for HFCs when they are contained in foams.

EPA is establishing requirements for the servicing, repair, disposal, and/or installation of equipment in the RACHP and fire suppression sectors as described in sections IV.C through G of this preamble. EPA interprets subsection (h) to provide authority that could be applied to practices, processes, or activities related to equipment across a broad range of sectors, subsectors, or applications that involve regulated substances and/or their substitutes. At

[50] Cal. Code Regs. Tit. 17, section 95373.

this time, EPA is focusing on certain sectors and subsectors in the requirements finalized in this rulemaking. In future rulemakings, EPA may consider establishing requirements for equipment in other sectors, subsectors, or applications that involve regulated substances and/or their substitutes. The relevant sections of this preamble describe the requirements that EPA is establishing for equipment in certain sectors and subsectors and how EPA understands these sectors and subsectors as relevant for these requirements.

Where EPA is establishing requirements for certain sectors or subsectors, we intend to be consistent with how those sectors or subsectors are understood under other provisions of the AIM Act and/or CAA title VI that address the same sector or subsector, such as subsection (i) of the AIM Act, through the Technology Transitions program. EPA issued a final Technology Transitions Rule on October 24, 2023 (88 FR 73098), which provides additional detail on many of the same sectors and subsectors for which this action finalizes certain requirements under subsection (h). EPA also considered how those sectors or subsectors are addressed in the 2023 Technology Transitions Rule in finalizing this rule under subsection (h) of the AIM Act.

EPA is establishing certain provisions, as described later in this preamble, for certain equipment in applicable subsectors within the RACHP sector in this action. Such subsectors within the RACHP sector include: supermarket systems; refrigerated transport; and automatic commercial ice makers.[51] EPA is also establishing certain provisions for equipment in the fire suppression sector, as described later in this preamble.

C. How is EPA addressing leak repair?

EPA is finalizing aspects of the proposed leak repair requirements, with modifications after consideration of the comments and information received on the proposed rule, as discussed in further detail in the following sections. The Agency is finalizing leak repair requirements for refrigerant-containing appliances with a charge size of 15 pounds or more that contain an HFC or substitute for an HFC with a GWP greater than 53. In the proposal, EPA bifurcated its compliance dates based on charge size, with refrigerant-containing appliances containing 50 pounds or more needing to comply within 60 days of publication in the **Federal Register** and refrigerant-containing appliances between 15 and 50 pounds having a compliance date of one year after publication in the **Federal Register**. In this final rule, after consideration of the comments, EPA is establishing one compliance date for all applicable appliances: January 1, 2026. The Agency views this change as reasonable to provide additional time for owners or operators with an appliance with a charge size of 50 pounds or more to comply with the leak repair requirements and avoid potential confusion due to varied compliance dates. Additionally, EPA is finalizing the narrow exemption of refrigerant-containing appliances in the residential and light commercial air conditioning and heat pumps subsector from the leak repair provisions in this final rule.

1. What refrigerants are subject to the leak repair requirements?

EPA is finalizing, as proposed, that the leak repair requirements apply to certain appliances that contain refrigerants that are composed in whole or in part of either a regulated substance or a substitute for a regulated substance with a GWP greater than 53, for reasons discussed in the proposal and in this final rule. To determine if the refrigerant contains a regulated substance, the owner or operator should consult the list of regulated substances provided in appendix A to 40 CFR part 84.[52] In the proposed rule, to determine whether an appliance containing a substitute for a regulated substance is required to comply with the leak repair provisions, EPA described the process for determining the GWP of regulated substances and/or their substitutes in the proposed Technology Transitions Rule (87 FR 76738, 76750, December 15, 2022). In the 2023 Technology Transitions Rule, published in the **Federal Register** on October 24, 2023 (88 FR 73098), EPA established a table listing the GWP values for substances that are not regulated substances. In this final rule, EPA is adopting the same approach for determining GWPs for those substances as in the final 2023 Technology Transitions Rule, codified at 40 CFR part 84, subpart B (40 CFR 84.64(a)–(c)) and, for consistency, is referencing the table at 40 CFR 84.64(b) for determining the GWPs of the listed commonly used non-HFC constituents. For purposes of this rulemaking, owners or operators should use the GWPs listed in that table to determine if the refrigerant contains a substitute for an HFC with a GWP greater than 53.

Comment: The Agency received multiple comments on the refrigerants subject to the leak repair provisions, including comments opposing a limit of 53 GWP for substitutes of HFCs. Some commenters suggested the Agency use a more generic value such as 100 or 150 to be consistent with the 2023 Technology Transitions Rule's approach. Another commenter expressed support for EPA's continued use of 100-year GWPs for the implementation and administration of provisions under the AIM Act and stated that they oppose the use of 20-year GWPs for the implementation of AIM Act rules. Finally, one commenter described issues with the proposal's resources to determine the GWPs of constituent parts of refrigerant blends or commonly used refrigerant alternatives. The commenter suggests that EPA compile a singular comprehensive list encompassing all substitute substances for GWPs exceeding 53. Additionally, the commenter stated that there is no reason to provide reference to substances with GWPs less than 53 to avoid confusion as these substitutes are not subject to this regulation.

Response: In response to these comments, EPA notes that it is finalizing, as proposed, that the leak repair requirements apply to refrigerant-containing appliances containing an HFC refrigerant or a substitute for HFC refrigerants that has a GWP above 53. EPA acknowledges comments seeking consistency across programs for GWP limits and finds it appropriate to continue to use 100-year GWPs for this rulemaking given the AIM Act uses 100-year GWPs. As discussed in the 2023 Technology Transitions Rule, the final limits in that rule were informed by a range of information, including the petitions, the Agency's evaluation consistent with the factors identified in subsection (i)(4) of the AIM Act, and comments received on that rule. Those considerations do not apply to this rulemaking, which is being undertaken under a different statutory provision and which establishes requirements that apply to certain substitutes for HFCs. As stated in the proposed rule under subsection (h), the GWP of 53 for substitutes for HFCs was chosen, given it is the lowest GWP of the HFCs that could be listed as a regulated substance

[51] In other actions by EPA, such as the 2023 Technology Transitions Rule or rulemakings and/or notices under the SNAP program, EPA refers to this subsector as "automatic commercial ice machines" or "commercial ice machines," respectively. EPA is clarifying that in this rulemaking, we intend for the term "automatic commercial ice makers" to cover the same types of refrigerant-containing equipment as those covered under "automatic commercial ice machines" in the 2023 Technology Transitions Rule or those covered as "commercial ice machines" under SNAP.

[52] This list currently matches the list of regulated substances in subsection (c) of the AIM Act.

under subsection (c)(3)(A)(i)(II) of the AIM Act. For purposes of this rulemaking, the Agency concludes it appropriate to parallel this statutory provision for the GWPs of the substances that could be designated as regulated substances under the Act. Regardless of GWP, any refrigerant that contains an HFC is covered under the leak repair provisions. Using a GWP of 53 for substitutes maintains consistency between the HFCs and their substitutes that are regulated under this rule under subsection (h). Moreover, the Agency notes that currently the vast majority of HFC refrigerants and refrigerant blends containing HFCs in equipment have much higher GWPs, often 20 to 50, or even more than 75 times as high as this cutoff. The Agency is aware of one HFC blend, IKON–A, currently in use for IPR which has a GWP below 53. However, the inclusion of a regulated HFC in the refrigerant blend means that any refrigerant-containing appliances using this blend are subject to the leak repair provisions of this final rule. In the future, EPA may find similar blends acceptable to use in specific applications, under other regulatory programs, but their applicability for the leak repair provisions of this final rule is subject to whether a blend contains an HFC or a substitute with a GWP greater than 53, not the GWP of the blend overall. Additionally, EPA acknowledges that over time the refrigerant market is likely to shift, particularly in light of the HFC phasedown under both the AIM Act and Montreal Protocol, the 2023 Technology Transitions Rule, and business decisions to use refrigerants that do not contain HFCs or a substitute with a GWP above 53.

EPA is establishing a lower-GWP threshold for the leak repair requirements in this final rule than it established under the 2023 Technology Transitions Rule for the use of an HFC in certain new equipment. EPA considers this lower threshold to be appropriate given the different goals of these regulations. One purpose for regulations under subsection (h), including the leak repair requirements, is minimizing releases of regulated substances from equipment. The 2023 Technology Transitions Rule was focused on restricting the use of higher-GWP HFCs in new equipment. Equipment that is compliant with the subsection (i) requirements may still be regulated under subsection (h) to minimize releases of HFCs from the equipment. Using a GWP of 53 as the cutoff under these regulations will address the release of substitutes with potentially comparable climate impacts to that of substances that are or could be listed as regulated substances. Further, if EPA were to establish a higher-GWP as the threshold, such as 150 or 700, that could create an incentive to switch to a substitute with a GWP greater than 53 but below that 150 or 700 GWP cut off to avoid a need to comply with leak repair requirements, even though those substitutes could have greater climate impact if released than some listed regulated substances.

Regarding the comments related to how to determine the GWP of substitutes, EPA responds that in the final rule, EPA has streamlined the process for owners or operators to determine the GWP of HFCs or substitutes for HFCs. An owner or operator can view GWP values for regulated substances by consulting the table in appendix A to 40 CFR part 84. Owners or operators can consult the table at 40 CFR 84.64(b) for determining the GWPs of listed commonly used non-HFC constituents to determine if the refrigerant contains substitute for an HFC with a GWP greater than 53. The list at 40 CFR 84.64(b) contains substitutes with GWPs less than 53 for purposes of the regulations under subpart B, but EPA disagrees that their inclusion would create confusion, as the regulatory text established in this rulemaking is clear that this list is being consulted for purposes of the subpart C regulations to determine whether a refrigerant contains a regulated substance with a GWP greater than 53.

Comment: Two commenters stated that EPA should consider safety aspects (*e.g.,* toxicity, flammability) of particular substances when deciding whether to apply the leak repair provisions, adding that subsection (h) specifically directs the Agency to ensure the safety of technicians and consumers. One commenter asked the Agency to consider whether a system is in direct or indirect contact with building occupants and charge size in its determination around applicability, rather than solely basing mandates on GWP. One of the commenters stated that the 53 GWP limit would drive more use of HFC–152, which the commenter claims is not a viable refrigerant and has historically been used agriculturally as a rodenticide.

The same commenter also requested that the Agency consider the provisions for leak repair under the parameters of safety and performance. The commenter specifically highlighted environmental concerns regarding the toxicity of fluorinated hydrocarbons that contain per- and polyfluoroalkyl substances (PFAS) and degrade into trifluoracetic acid (TFA). They suggested that the Agency require leak repair of systems with a charge size of 50 or more pounds for any HFCs, HFOs, or hydrochlorofluoroolefins (HCFOs) if the decomposition of said substance decomposes into TFA at levels greater than a 10 percent yield. The commenter used HFO–1234yf as an example, which produces byproduct yields of TFA greater than 10 percent.

Response: With respect to the comment suggesting that EPA consider performance as a parameter for these regulations, EPA notes that the statutory text under subsection (h)(1) does not mention consideration of performance as a separate parameter in establishing regulations under this provision. Further, the commenter did not provide any supporting analysis or technical information to explain why it would be useful to consider performance as a parameter in establishing the leak repair requirements, or how doing so might affect the final rule. Nothing in the comment suggests that performance of refrigerant-containing appliances would be negatively affected by this final rule or that this rule would prevent an owner or operator from addressing performance issues as appropriate. Thus, the Agency is not using performance as a separate parameter in establishing the final rule's leak repair requirements. Additionally, the Agency is aware that leaky equipment can have performance issues, and following the requirements in this rule may also have the effect of helping address those issues.

With respect to comments on safety, The Agency agrees that subsection (h)(1) of the AIM Act identifies ensuring the safety of technicians and consumers as one of the purposes for regulations under this subsection. EPA has a long history of screening the risks of ODS, HFCs, and their substitutes under SNAP, which for decades has provided a list of acceptable alternatives for a number of sectors. EPA does not view the GWP threshold, and the applicable refrigerants covered in the final rulemaking, as a significant safety risk to technicians and consumers if the refrigerants are properly managed. Refrigerants used in appliances have been thoroughly screened for risks associated with toxicity, flammability, asphyxiation, and physical hazards before being listed as acceptable for use under SNAP's comparative risk framework. While some refrigerants may be mildly flammable (*e.g.,* A2L refrigerants) or have toxicity (*e.g.,* ammonia), proper system design, engineering controls, and other

techniques mitigate the risk for the use of refrigerants in appliances. EPA also notes the existence of other regulations that address the risks related to specific compounds, like ammonia (*e.g.,* EPA's Risk Management Program under the CAA). EPA disagrees with one commenter's suggestion to base the applicability of the leak repair requirements on whether the appliance is in direct or indirect contact with building occupants or other suggested factors (*e.g.,* toxicity). The commenter has not persuasively explained why such an approach would better serve the goals of ensuring the safety of technicians and consumers than having the leak repair requirements apply to equipment regardless of whether it is in direct or indirect contact with building occupants (or technicians and consumers, for that matter), particularly considering the rigorous evaluation of refrigerants under SNAP's comparative risk framework and other regulations addressing potential health and safety concerns. It is also not clear how such an approach would serve other statutory goals for regulations under subsection (h)(1) such as maximizing reclamation and minimizing releases of HFCs from equipment. Considering all three purposes, EPA concludes that it is appropriate to apply the leak repair requirements to equipment that is in both direct and indirect contact with consumers. With respect to the comment suggestion that EPA consider charge size in determining applicability of the leak repair provisions, EPA has considered charge size, as discussed in section IV.C.2 of this preamble. In response to one commenter's specific concern with HFC–152, the Agency responds that we are not aware of any use of HFC–152 in the RACHP sector in the United States. Further, as HFC–152 is a listed regulated substance, if it were used in refrigerants, the leak repair requirements would apply; thus, EPA disagrees that the GWP threshold of 53 for substitutes for HFCs would drive additional use of HFC–152. However, EPA is aware of significant use of HFC–152a with a GWP of 124, which is also a regulated substance and above the 53 GWP threshold.

EPA acknowledges the concerns one commenter raised regarding PFAS. There is currently no single commonly agreed definition of PFAS, and whether HFCs, HFOs, or HCFOs are classified as PFAS depends on the definition being used. EPA's PFAS roadmap sets timelines for specific actions and outlines EPA's commitments to new policies to safeguard public health, protect the environment, and hold polluters accountable.[53] This rule does not in any way establish a definition of PFAS, nor do the leak repair or other requirements in this final rule depend on a specific definition. As previously stated, SNAP already considers potential risks to human health and the environment via its comparative risk framework. Regardless of what definition of PFAS is used, not all PFAS are the same in terms of toxicity, for example. If a chemical has been found to present lower overall risk to human health or the environment, it might be found acceptable under SNAP regardless of whether or not it falls under a particular definition of PFAS. Potential risks to human health or the environment regarding PFAS have been considered directly on a chemical-by-chemical basis and are not based on whether a specific chemical falls into a particular category of substances. Therefore, EPA elected in this final rule to require leak repair for all refrigerants that contain an HFC or an HFC substitute with a GWP greater than 53, without regard to whether or not the substance falls within a particular definition of PFAS. Under that approach, regulated entities are not required to use any particular HFC or HFC substitute, and the approach inherently permits equipment owners and operators to make decisions about what refrigerants are appropriate for use in their particular equipment.

Regarding the commenter's related concern regarding atmospheric decomposition of certain HFCs, HFOs, and HCFOs to TFA, EPA notes that TFA is a perfluorinated acid. Where TFA has been included in a particular definition of PFAS, it is often part of a class of chemicals containing more than 4,730 substances. According to the Montreal Protocol's Environmental Effects Assessment Panel (EEAP)[54] about 256 PFAS are in commercial use, with widely differing physical, chemical, and biological properties.[55] The 2022 EEAP Assessment Report[56] explained that one source of TFA in the environment is the degradation of some HFCs, HCFCs, HFOs, and HCFOs, while other potential sources of TFA include geogenic sources; effluents and releases from the manufacture of fluorinated chemicals; combustion and degradation of fluorinated chemicals in commercial and household waste; and biological and environmental degradation of chemicals such as certain pharmaceuticals and pesticides. The 2022 EEAP Assessment Report indicates that while TFA "is unlikely to cause adverse effects in terrestrial and aquatic organisms, [continued] monitoring and assessment are nevertheless advised due to uncertainties in the deposition of TFA and its potential effects on marine organisms." The report notes that "TFA does not bioaccumulate nor is it toxic at the low to moderate exposures currently measured in the environment or those predicted in the distant future." It further explains that because the HCFCs and HFCs are long-lived in the atmosphere, they distribute globally, and TFA from these substances is more evenly deposited. The HFOs and HCFOs have shorter lifetimes in the atmosphere, and deposition of TFA from these substances is likely to be more localized. This will result in greater concentrations near the locations of release. These greater concentrations are unlikely to present a risk to humans or the environment in these locations, but changes in concentration in surface water (or soil) would respond rapidly to releases. The 2022 Assessment EEAP Report states, "[monitoring] of the environment for residues of TFA would provide an early warning if trends in concentration indicate rapid increases." EPA reiterates that the SNAP program considers ecotoxicity as a criterion when evaluating alternatives under its comparative risk framework and has considered the potential impacts of TFA in past actions where SNAP found HFO–1234yf acceptable in certain end uses. The myriad studies EPA referenced in those actions all concluded that the additional TFA from HFO–1234yf did not pose a significant additional risk, even if it were assumed to be used as the only refrigerant in all refrigeration and air conditioning equipment (76 FR 17492–17493, March 29, 2011). The Agency intends to continue its approach to evaluating the potential risks from TFA in the future. However, in light of this scientific and technical information regarding the potential impacts of TFA from releases of HFCs, HCFCs, HFOs, and HCFOs, EPA does not agree that it is necessary to apply the leak repair requirements based on whether a refrigerant decomposes into TFA at levels greater than a 10 percent yield.

Comment: Some commenters stated that the leak repair provisions should apply to substitutes regardless of GWP as this would result in decreasing

[53] Available at *https://www.epa.gov/pfas.*

[54] The EEAP is an advisory body to the Montreal Protocol Parties that evaluates the consequences of stratospheric ozone depletion and additional areas of potential importance to the Montreal Protocol.

[55] UNEP. 2022 Assessment Report of the Environmental Effects Assessment Panel. Available at: *https://ozone.unep.org/system/files/documents/EEAP-2022-Assessment-Report-May2023.pdf.*

[56] Ibid.

refrigerant emissions. One commenter suggested that the Agency omit the GWP threshold for ''non-natural'' (*i.e.,* fluorinated) substitute refrigerants. One commenter did not express an opinion on the proposed GWP limit of 53 but appreciated that the Agency could extend beyond a GWP of 53 in the future.

Response: EPA acknowledges that in the future the Agency could consider whether a GWP limit lower than 53 is appropriate. One of the purposes stated in the AIM Act for regulations under subsection (h) is minimizing releases of regulated substances from equipment, and the 53 GWP threshold in this final rule parallels the lowest listed GWP of regulated substances in the AIM Act. Given the range of refrigerants currently in use that have a variety of properties and characteristics (including a wide range of GWPs), EPA concludes that it is appropriate to use a GWP of 53 as the threshold for substitutes for HFCs that would be subject to leak repair requirements in this rulemaking, as that will address the release of substitutes with potentially comparable climate impacts to that of substances that are or could be listed as regulated substances, regardless of whether that substance is a fluorinated substitute. Further, non-HFC refrigerant substitutes below the 53 GWP threshold do not have commensurate climate impacts on HFCs or their covered substitutes. Therefore, EPA finds it is appropriate to not establish leak repair requirements for non-HFC substitutes with a GWP below 53 at this time. If EPA becomes aware of concerns related to this limitation as the refrigerant market shifts to lower-GWP substitutes for HFCs, EPA could consider revisiting the requirement via a notice-and-comment rulemaking. By finalizing a GWP threshold of 53, as well as the provision to include refrigerant blends with any HFCs as components regardless of their GWPs, EPA is not precluding further consideration of a lower-GWP threshold in the future.

The Agency is finalizing leak repair requirements for appliances that use a refrigerant blend that contains an ODS and an HFC or a substitute for an HFC with a GWP greater than 53 to simultaneously meet the leak repair provisions promulgated under CAA section 608 at 40 CFR 82.157, and the provisions in this action, to the extent that either set of requirements is applicable. EPA intends for the leak repair requirements in this rulemaking to be sufficiently consistent with the requirements at 40 CFR 82.157 such that both sets of requirements could be met for refrigerant-containing appliances that use a refrigerant blend containing an ODS and an HFC or a substitute for an HFC with a GWP above 53 and that have a full charge of 50 or more pounds of refrigerant. Due to the difference in charge sizes for equipment covered by 40 CFR 82.157 and the leak repair requirements finalized in this action, such appliances using such a refrigerant blend with a charge size of 15 pounds or higher but below 50 pounds are only subject to the requirements under subsection (h).

Comment: One commenter stated that the proposed requirements for owners and operators with an appliance using both ODS and HFCs were unnecessarily burdensome. The commenter expressed the view that any differences with the 40 CFR 82.157 ODS requirements (*e.g.,* leak rate calculations, lowering the proposed threshold for chronically leaking appliances) would significantly increase the complexity and burden of requirements. Another commenter requested clarification on the types of appliances containing ODS that would be subject to the leak repair provisions. The commenter posited two scenarios. One would imply that all appliances containing only ODS refrigerant are exempt from the provisions of the rule, and the other would imply that appliances regulated by 40 CFR part 82, subpart F are excluded from this rule's leak repair requirements. One commenter stated that having the requirements be consistent with those for ODS would make it easier for the many end users who are already required to comply with ODS substance requirements.

Response: EPA acknowledges that where appropriate, consistent leak repair requirements could smooth implementation of both programs. As described in this section, the conclusion that refrigerant-containing appliances using a refrigerant blend containing an ODS and an HFC or a substitute for an HFC with a GWP greater than 53 is subject to leak repair requirements under both CAA section 608 and subsection (h) of the AIM Act is the result of how applicability is determined for these provisions. EPA intends for the leak repair requirements in this rulemaking to be sufficiently consistent with the requirements under CAA section 608 such that both set sets of requirements could be met for refrigerant-containing appliances using an ODS/HFC blend. The Agency did not reopen the requirements promulgated under CAA section 608, codified at 40 CFR part 82, subpart F, in its proposed rule under subsection (h) of the AIM Act and is not amending those regulations in this final rule, including the applicability provisions through this action. Thus, those provisions continue to apply for appliances using a refrigerant that contains an ODS with a full charge of 50 or more pounds of refrigerant.

In consideration of (h)(3), which authorizes EPA to coordinate with other similar EPA regulations, including the extensive experience in implementing leak repair requirements under CAA section 608 codified at 40 CFR 82.157, EPA is finalizing many provisions that are identical or similar to those in 40 CFR 82.157. Examples include the methodology for determining the leak rate, the timing for repairs, and verification tests. One notable difference between the regulatory requirements under CAA section 608 and subsection (h) of the AIM Act is the applicable charge size, which is discussed in section IV.C.2 of this preamble. The similarities in these requirements should facilitate compliance with both sets of requirements where both apply. Accordingly, EPA does not agree with the comments that complying with the ODS and HFC leak repair provisions simultaneously would be unduly burdensome. Furthermore, the commenters did not provide sufficient data to support this statement or to allow EPA to fully evaluate commenter's claims of undue burden and other potential approaches to addressing such burden. The grants of authority under CAA section 608 and subsection (h) of the AIM Act are not identical, and more than 30 years have passed since the issuance of the initial regulations under CAA section 608. Therefore, in some instances, this final rule does differ from the CAA section 608 regulations. EPA is not establishing an exemption from the requirements in this rule for equipment that is subject to the requirements under 40 CFR part 82, subpart F, because, if such equipment also contains an HFC or a substitute for an HFC with a GWP above 53, it is appropriate for it to comply with the leak repair requirements under subsection (h)(1). This approach ensures that such equipment is subject to requirements designed to meet the direction under and the particular statutory purposes identified in subsection (h), such as maximizing reclaim and minimizing releases of HFCs from equipment.

To address one commenter's request for clarity on the overlap of leak repair requirements for appliances containing ODS and HFCs and their substitutes, EPA reiterates that owners and operators would only need to comply with the leak repair provisions under both 40 CFR part 82, subpart F and 40

CFR part 84, subpart C if the refrigerant-containing appliance uses a refrigerant containing ODS and an HFC or HFC substitute with a GWP greater than 53. If an appliance uses a refrigerant that solely contains ODS (and meets the other applicability criteria), it is subject to 40 CFR part 82, subpart F leak repair requirements, but not the leak repair requirements under this final rule. Conversely, if an appliance solely contains an HFC or HFC substitute with a GWP greater than 53 (and meets the other applicability criteria) the owner will need to comply with the leak repair provisions in this final rule, but not the leak repair requirements in 40 CFR 82.157. EPA is not aware of any widespread use of ODS/HFC blends. However, to the extent such blends are in use, requirements under the CAA title VI regulations and the CAA itself restrict use of ODS in new and existing equipment, thus further limiting the likelihood of one appliance being subject to the two sets of leak repair requirements.

2. Appliances with what charge size are subject to the leak repair requirements?

EPA is finalizing that, with certain exceptions, appliances with a charge size of 15 pounds or more of refrigerant that contains a regulated substance or a substitute for a regulated substance with a GWP greater than 53 are subject to the leak repair requirements under subsection (h) of the AIM Act, for reasons discussed in the proposal and in this final rule. This establishes a lower threshold than in the regulations established under CAA section 608 nearly 30 years ago. As discussed in the proposal, applying the leak repair requirements to more equipment will reduce the release of HFCs from equipment and increase the amount of HFCs that will be available for recovery and reclamation because of avoided releases of HFCs from leaks. The AIM Act provides a schedule for a phasedown of HFCs, as opposed to the phaseout of ODS under the CAA. Therefore, there may be continued introduction of HFC-containing appliances indefinitely, which is a notable difference from the restrictions on ODS under the CAA. As described more fully in section II.B of this preamble, subsection (h)(1) of the AIM Act tasks the Agency with promulgating ''regulations to control, where appropriate,'' certain practices, processes, or activities for certain purposes, including minimizing the release of regulated substances from equipment and maximizing the reclamation of regulated substances. As described previously, the phrase ''where appropriate'' in subsection (h)(1) provides EPA with discretion to reasonably determine how the regulations under subsection (h)(1) will apply, including by making determinations about the charge size threshold of equipment that is subject to the leak repair requirements. In exercising its discretion under this provision, EPA has taken a number of considerations into account, such as: the text of subsection (h)(1) including the statutory purposes identified in that provision; the anticipated effectiveness of the requirements under consideration in serving those purposes; the intent of subsection (h), considering the overall context and structure of the AIM Act; and information and insight drawn from EPA's past experience with the same or similar practices, processes, or activities, as well as sectors, subsectors, and markets, gained from implementing other programs, including under other provisions of the AIM Act and the CAA. In establishing the 15-pound threshold for leak repair requirements in this rulemaking, EPA considered both the purposes of minimizing the release of HFCs from equipment and maximizing reclamation, as well as other factors as discussed further in other responses to comments in this section. For example, EPA considered information regarding refrigerant-containing appliances where HFCs or their substitutes are currently being used and where they are expected to be used in the coming years; the universe of affected appliances subject to the leak repair requirements at 40 CFR 82.157 and how the refrigerant-containing appliances being used in the market and aftermarket has changed over time, including with respect to charge size; and design elements of different types refrigerant-containing appliances with different charge sizes and the propensity of that equipment to leak (*e.g.,* whether the equipment is hermetically sealed), as well as whether it is typically repaired for continued use, or alternatively disposed of, if it is not functioning properly. Consideration of these factors informed EPA's evaluation of the charge sizes of refrigerant-containing appliances for which leak repair is likely to be effective at minimizing releases of refrigerant from appliances and maximizing reclamation. EPA also considered the importance of proper refrigerant management for successful implementation of the phasedown and for supporting the existing installed base of appliances. Based on such considerations, and as discussed in greater detail below, EPA concludes it is appropriate to use a 15-pound threshold for the leak repair requirements under this rule and that this threshold will further serve the purposes identified in subsection (h)(1) of minimizing the release of HFCs from equipment and maximizing reclamation.

By establishing an applicable charge size of 15 pounds or more of refrigerant, with certain exemptions, the universe of affected appliances covered by the leak repair requirements under subsection (h) is larger than the universe of appliances containing ODS refrigerants and subject to the leak repair provisions at 40 CFR 82.157. For example, the applicable charge size of 15 pounds or more of a refrigerant that contains an HFC or substitute refrigerant with a GWP above 53 is expected to cover certain appliances in the following subsectors:

- Train air conditioning;
- Passenger buses (*e.g.,* school, coach, transit, and trolley buses);[57]
- Refrigerated transport—rail;
- Large retail food remote condensing units (*e.g.,* cold rooms in supermarkets); and
- Commercial unitary air conditioning (*e.g.,* a system for a mid-sized office building).

EPA is establishing a 15-pound refrigerant charge size threshold for refrigerant-containing appliances subject to the leak repair requirements in this final rule based in part on consideration of an analysis of refrigerant-containing appliances where HFCs or their substitutes are currently being used and where they are expected to be used in the coming years. EPA conducted an analysis[58] using the Vintaging Model to estimate the quantity of refrigerants used in equipment of varying charge sizes (also called the ''installed stock''). The Vintaging Model tracks the transition from ODS to substitutes including HFCs by modeling the total pieces of equipment and average charge sizes—which could vary over time based on vintage and the ODS or substitute used—in over 60 subsectors. Doing so allows us to analyze the pieces of equipment and total refrigerant in equipment by charge size. A current snapshot of the model's estimates of the installed stock of HFC and HFC substitute refrigerants in 2025 shows

[57] ''Bus'' is defined at 40 CFR 1037.801 and means ''a heavy-duty vehicle designed to carry more than 15 passengers. Buses may include coach buses, school buses, and urban transit buses.''

[58] U.S. EPA. 2023. EPA's Vintaging Model representing the Allocation Framework Rule as modified by the 2024 Allocation Rule RIA Addendum and the 2023 Technology Transitions Rule RIA Addendum. VM IO file_v4.4_02.04.16_Final TT Rule 2023 High Addition.

that approximately 42 percent of refrigerants (on a weighted carbon dioxide equivalent (CO_2e) basis) are used in appliances with a charge size above 15 pounds. In evaluating where leak repair could be effective at reducing releases of refrigerant from appliances (*e.g.,* trains and passenger busses), which may result in additional environmental benefits, as well as looking at changes in the RACHP market and aftermarket over the past few decades, EPA finds it appropriate to establish a charge size threshold of 15 pounds for refrigerant-containing appliances to be subject to the leak repair requirements. As a general matter, appliances containing less than 15 pounds of refrigerant are significantly more likely to be hermetically sealed (and thus less prone to leaking) and more likely to be replaced rather than be repaired.

EPA considered the statutory purposes in subsection (h)(1) to maximize the reclaiming and minimize the release of regulated substances from equipment when setting the threshold for appliances covered for the leak repair requirements. These purposes guided EPA's considerations in exploring different charge sizes, as did the Agency's consideration of what regulations would be "appropriate" to control the relevant practices, processes, or activities to serve these purposes, consistent with subsection (h)(1).

Comment: EPA received many comments supporting the 15-pound charge size threshold. One commenter expressed support of EPA's proposed rule, stating that HFC emissions do not respect State boundaries and a Federal approach is critical to avoid piecemeal regulations and facilitate the implementation of industry-wide emissions reductions. Another commenter stated that it was reasonable for EPA to have a different charge size threshold than the ODS regulations to preserve the supply of HFC refrigerants. Several commenters in favor of the proposal recommended EPA consider a lower charge size threshold (*e.g.,* five pounds) to avoid additional GHG emissions. One commenter suggested a charge threshold size between one and five pounds to include smaller appliances and achieve additional reductions to HFC emissions. Another commenter stated that lowering the charge size threshold decreases the incentive for owners and operators to replace one large system with smaller systems to skirt regulatory obligations. One commenter stated that EPA's estimates (on a weighted CO_2e basis) show that appliances below 15 pounds account for around 39 percent of total HFC refrigerants. The commenter suggested that lowering the threshold will close the gap on HFC management and build on existing recordkeeping requirements for technicians who evacuate refrigerant from appliances with a full charge between 5 and 50 pounds.

Response: EPA is finalizing the 15-pound charge size threshold as proposed. The Agency acknowledges the numerous supportive comments for the 15-pound charge size threshold. Since the 1990s, when EPA established the 50-pound charge size for ODS refrigerant-containing appliances, there have been changes in appliance design, use, and practices. In 2016, EPA updated the leak repair program under CAA section 608, partly in consideration of these changes. For the most part, the leak repair provisions for HFCs finalized in this action are consistent with that rule. However, EPA did not change the 50-pound threshold in the 2016 CAA Section 608 Rule, and thus the 15-pound threshold is different from the threshold under the CAA section 608 regulations at 40 CFR part 82, subpart F. Through this notice-and-comment rulemaking, the Agency provided notice of this lower threshold level and considered the public comments received. The Agency's rationale for a 15-pound threshold is discussed in the proposal and in section IV.C.2 of this preamble. As discussed previously, applying the leak repair requirements to more refrigerant-containing appliances will reduce the release of HFCs from said appliances and increase the amount of HFCs available to recover that would be otherwise lost because of leakage from appliances. Furthermore, the HFC phasedown will not eliminate the use of HFCs in the U.S. market, so there may be continued introduction of new HFC-containing appliances; thus, proper management of these refrigerant-containing appliances is necessary for the successful implementation of the HFC phasedown, and to ensure there is an adequate supply of reclaimed HFCs to support the existing installed base of HFC-containing appliances. The Agency also disagrees with one commenter's statement that a lower threshold would disincentivize owners or operators from installing multiple smaller refrigerant-containing appliances to skirt the leak repair requirements of this final rule. The 15-pound threshold is intended to be low enough to hinder efforts to avoid applicability of the leak repair requirements and ensures a sizeable proportion of refrigerant-containing appliances are subject to the leak repair requirements of the final rule. After further evaluation informed by consideration of these comments, EPA is finalizing a 15-pound charge size requirement for HFC and covered HFC substitute refrigerants.

EPA took comment on, but is not finalizing, leak repair requirements for equipment with charges of less than 15 pounds. One commenter stated that a lower threshold could bridge that gap on HFC emissions by capturing more refrigerant-containing appliances. While EPA agrees that there could be instances where this may reduce releases of refrigerants, we also note that many refrigerant-containing appliances with charge sizes under 15 pounds are typically hermetically sealed, which means they are less leak prone; these refrigerant-containing appliances are also normally disposed of once they stop functioning properly, rather than being repaired for further use. The commenter stated that lowering the threshold would build on existing requirements to recover refrigerants from small appliances (5 pounds or less) under 40 CFR 82.155, which apply to HFCs. However, as previously discussed, these types of refrigerant-containing appliances are at low risk for leakage. Although the safe disposal requirements for small appliances under CAA section 608 do not address leaks, the provision ensures that the refrigerant within these appliances is not released at disposal. Further, EPA notes that refrigerant-containing appliances between 5 and 15 pounds are still subject to the venting prohibition under section CAA section 608(c) (codified in EPA's regulations 40 CFR 82.154(a)(1), which prohibits the knowing venting or release of HFCs from refrigerant-containing appliances during the maintaining, servicing, repairing, or disposing of the appliance. While EPA agrees that there could be reasons to consider lowering the charge size threshold to five pounds or lower, the Agency would want to further evaluate various aspects of a lower threshold before proposing to establish one, such as the potential for such a threshold to serve the purposes identified in subsection (h)(1), whether there are particular considerations about what types of requirements might be appropriate for such appliances, including common design elements for these appliances, and any information available about the occurrence or cause of leaks in such appliances.

Comment: A number of commenters opposed the 15-pound charge size threshold for leak repair and stated that the threshold is not cost-effective, may confuse owners and technicians, will

increase repair cost, and will double the regulatory responsibilities for industry as compared to CAA section 608 regulations, without commensurate environmental benefits. Several commenters provided estimates for the number of refrigerant-containing appliances subject to the leak repair requirements, which ranged from two to five times greater than the number of refrigerant-containing appliances that would be subject to the leak repair provisions at a 50-pound threshold. Several commenters requested that EPA require leak repair for appliances with a full charge of 50 or more pounds as this is the current ODS threshold under CAA section 608 regulations. One commenter claimed that it could be difficult to effectively distinguish between units charged with HFCs, ODS, or a combination of both for purposes of compliance, and that it would be difficult for equipment owners and certified technicians to determine the applicability threshold for any particular refrigerant/appliance. The commenter asserted that EPA should maintain the 50-pound threshold for applicability to promote compliance, maintain consistency in operations, and avoid unjustified costs. Another commenter urged EPA to direct leak repair requirements to larger appliances with a charge size of 50 pounds or more, as technological advancements have allowed for smaller charge sizes in appliances and therefore have reduced the potential harm to the environment in the event of a leak. The commenter also asserted that the 15-pound threshold could discourage manufacturers from improving the efficiency of refrigeration appliances to reduce overall refrigerant usage. One commenter suggested EPA wait a period of time (*e.g.,* five years) from the effective date of the final rule to see if there is a reduction in HFC use and their corresponding emissions. The commenter recommended that if substantial HFC use and emissions reductions are not observed, then EPA could evaluate and propose a new applicability threshold. Alternatively, the commenter suggested EPA could establish a charge size threshold at 40 pounds, as there have been technological reductions in charge sizes due to the phaseout of ODS. A few commenters recommended that EPA increase the threshold from the proposed 15 pounds to 30, 40, or 50 pounds to better align with CAA section 608 regulations. One commenter claimed the 15-pound threshold does not provide enough environmental benefits to justify the cost increases to small business owners, local school systems, and mass transit operators. The commenter stated that while a 50-pound threshold is preferable, a 30-pound threshold would mitigate some of these costs and challenges. Another commenter stated that the 15-pound threshold was too low and would dramatically increase the number of affected appliances; suggesting that a 30-pound threshold would be more appropriate and still expand upon the CAA regulations.

Response: EPA disagrees with commenters that the 15-pound threshold will confuse technicians and facility owners. While this lower threshold will affect different sizes and types of refrigerant-containing appliances than the 50-pound threshold for ODS appliances, the leak repair activities are consistent with the subpart F requirements. Through this notice-and comment rulemaking the Agency informed stakeholders of this lower threshold level and explained the Agency's rationale for a 15-pound threshold in section IV.C.2 of this preamble. EPA intends to provide information to the regulated community on its website and additional communication about the requirements to affected stakeholders. EPA also disagrees that owners or operators would have difficulty determining what refrigerants are being used within a refrigerant-containing appliance or that they would have difficulty determining the charge size of a refrigerant-containing appliance. An owner or operator should be fully aware of the type of refrigerant that is being used in a refrigerant-containing appliance, and the determination of an appliance's full charge (as described in section IV.A.2 of this preamble) is the same as its use under the CAA section 608 regulations.

The Agency disagrees with a commenter's claim that the 15-pound threshold would uniquely burden small businesses, schools, and mass transit operators. Small businesses and schools, depending on equipment type, may fall under the narrow leak repair exemption for residential and light commercial air conditioning and heat pumps, easing some of their regulatory burden. The final rule's leak repair provision may affect operators of air conditioning on mass transit (*e.g.,* trains) and school buses, but the commenter did not provide specific evidence to support their claim that the leak repair requirements would increase costs to an extent that it unduly burdens these refrigerant-containing appliance owners.

EPA disagrees with a commenter's suggestion to pause the compliance date of the leak repair provisions to see if there is a substantial reduction in HFC use and emissions. The Agency notes that the HFC phasedown is substantially reducing the production and consumption of HFCs; thus, the overall use of virgin HFCs is going to be reduced as the phasedown progresses. However, as previously stated, the phasedown will not eliminate the production and consumption of HFCs, and specific measures are necessary to limit the impacts of HFCs on the environment and ensure that the supply of HFC refrigerants is available for use in existing systems. This action is focused on implementing subsection (h) of the AIM Act, which establishes distinct authorities focused on minimizing the release of HFCs and maximizing the recovery of HFCs for reclamation. The vast majority of HFCs are used in the RACHP sector and its subsectors; thus, leak repair requirements for this sector are vital to minimizing the release of HFCs and maximizing reclamation. Additionally, in the context of the HFC phasedown, not establishing requirements to limit the release of HFCs will create supply issues as the phasedown progresses. Therefore, the timing of the leak repair requirements in this final rule is vital to the implementation of the HFC phasedown and ensures that a supply of reclaimed HFCs is available for owners or operators to continue to use HFCs for their refrigerant-containing appliances. The Agency agrees that additional data may inform future decisions under subsection (h) and more broadly under the AIM Act. Such information could lead to a future notice-and-comment rulemaking that may consider a lower threshold for refrigerant-containing appliances subject to leak repair requirements. However, based on the data available now, the Agency concludes that it is appropriate to proceed with the leak repair requirements for appliances with a full charge size of 15 pounds or more and with a compliance date of January 1, 2026, as part of implementing subsection (h).

The Agency also disagrees with some commenters' assertions that the 15-pound threshold would increase the number of refrigerant-containing appliances subject to leak repair by a factor of two to five times the number of affected appliances under CAA section 608. The final rule will include a substantial number of new appliances under the leak repair provision but not the extent claimed by the commenter. Vintaging Model estimates on the total number of refrigerant-containing appliances subject to the leak repair

provisions of the final rule are estimated to affect 971,133 appliances with a charge size between 15 and 50 pounds and 580,653 appliances with a charge size above 50 pounds. As previously stated, EPA understands that the 15-pound threshold does increase the number of refrigerant-containing appliances subject to leak repair. This decision was based on EPA's evaluation of changes in the RACHP market and aftermarket (*e.g.,* the overall reduction of refrigerant charge size). With these considerations, EPA determined that capturing refrigerant-containing appliances at charge sizes below 50 pounds will further serve the purposes of minimizing the release of HFCs from equipment. Therefore, the Agency finds it appropriate to establish a charge size threshold of 15 pounds for refrigerant-containing appliances to be subject to the leak repair requirements.

For these reasons EPA also disagrees with one commenter's claim that refrigerant-containing appliances below 50 pounds should not be subject to the leak repair provision because their reduced charge size has mitigated their potential to harm the environment. The extension of the leak repair requirements to refrigerant-containing appliances below 50 pounds was found to be feasible because of the technological improvements to refrigerant charge size over decades. These changes in charge size in the RACHP sector informed EPA's decision to capture appliances between 15 and 50 pounds because those appliances still contain HFCs or covered substitutes that have a detrimental effect on the environment. The reduction in charge size does mitigate the total amount of refrigerant that is capable of being lost during a leak event, but it does not account for the proper management of refrigerant-containing appliances and fixing leaks within said appliances. EPA also disagrees with the commenter's assertion that lowering the threshold to 15 pounds will deter manufacturers from continuing to make technological advancements to appliance charge size. Manufacturers' incentives to create smaller refrigerant-containing appliances are not solely based on the charge size threshold for leak repair in this final rule, nor was this the case in the context of the 50-pound threshold under the CAA section 608 regulations. The commenter did not provide additional information to sufficiently reason that this would be the case, and EPA notes that charge size reductions have occurred over decades because of improvements to appliance design and energy efficiency.

EPA acknowledges commenters' concerns regarding the costs and benefits associated with leak repair. Further discussion on the costs and benefits associated with this final rule and discussions on the draft RIA addendum and Economic Impact and Benefits TSD can be found in section VI.B of this preamble. EPA is not relying on those analyses as a record basis for this rulemaking, and the Agency would reach the same conclusions on the suitability of a 15-pound charge size threshold without those analyses. However, the analyses in the TSD reflect that the leak repair requirements in this final rule will provide several benefits to owners or operators and EPA acknowledges that certain costs will be associated with the implementation of the leak repair provisions. First, the leak repair requirements of this rulemaking are likely to provide owners or operators information that leaks are occurring earlier than would have otherwise been known. Fixing those leaks will reduce the amount of refrigerant needed to be added to the system thereby reducing refrigerant costs for the owner/operator. Secondly, a system that is operating with less than the full charge of refrigerant is likely to consume more energy or not provide the desired cooling effect, both of which increase the owner's operating costs. As an example, a unit cooler with 15 to 50 pounds of refrigerant might be used for a large cold room. If that cooler is not providing the cooling needed, products could spoil, representing a potential large cost to the owner, in addition to the costs of the additional energy used to operate the off-specification equipment, which may be potentially avoided if the owner or operator performs the leak inspection and repair requirements of this rulemaking.[59] Regarding the issue of cost-effectiveness of a 15-pound threshold raised by some commenters, the Agency refers the reader to section VI.B of the preamble. The Agency reiterates that this rulemaking is designed to serve the purposes identified in subsection (h)(1) of the AIM Act, including maximizing reclamation and minimizing the release of regulated substances from equipment.

Comment: A commenter in opposition of the 15-pound threshold claimed that the reasoning for changing the charge size threshold appears to be arbitrary and capricious. The commenter claims the reduction is unmerited based on the availability of newer technologies using smaller charge sizes. They further assert the replacement of older appliances with new and more efficient appliances is one of the goalposts of the AIM Act. The commenter stated that applicability of the leak repair and detection requirements will act as a deterrent for replacing appliances and is unnecessary and unreasonable given reductions in available HFC stocks. The Agency also received a similar comment stating that the proposal did not provide clear justifications for lowering the charge size threshold below 50 pounds.

Response: The Agency disagrees that the 15-pound threshold is arbitrary and capricious. Subsection (h)(1) of the AIM Act directs the Agency to promulgate "regulations to control, where appropriate," certain practices, processes, or activities, for certain purposes, including minimizing the release of regulated substances from equipment and maximizing their reclamation of regulated substances. As explained earlier in this preamble, the phrase "where appropriate" in subsection (h)(1) provides EPA with discretion to reasonably make determinations on how the regulations should apply including, among other things, to select an appropriate charge size threshold for refrigerant-containing appliances subject to the leak repair provision. As previously stated, the Agency is applying leak repair requirements to more refrigerant-containing appliances than under the CAA section 608 rules to reduce the release of HFCs from said appliances and increase the amount of HFCs available for recovery that would otherwise be lost because of leakage from such appliances. Given that the purposes identified for regulations under subsection (h)(1) include maximizing reclamation and minimizing release of HFCs from equipment, EPA interprets the intent of subsection (h)(1) to be that the regulations promulgated under it may apply as broadly as needed to serve those purposes, while also being mindful of the statutory text indicating that the controls should apply "where appropriate." EPA finds it appropriate to apply the leak repair requirements to equipment with a charge size below 50 pounds for several reasons. Technological advancements have lowered the charge sizes of many refrigerant-containing appliances, such that using a charge size threshold of 50 pounds today would leave many such appliances unregulated. Refrigerant-containing appliances between 15 and 50 pounds still contain climate-

[59] Impacts of Refrigerant Charge on Air Conditioner and Heat Pump Performance" (2010). International Refrigeration and Air Conditioning Conference. Paper 1122. Available: *http://docs.lib.purdue.edu/iracc/1122.*

damaging HFCs or HFC substitutes that are appropriately addressed under subsection (h)(1). Such appliances can still leak, and if they are not repaired, could release refrigerant, which would not be available for reclamation once it had leaked. Thus, applying the leak repair requirements to this equipment is part of the regulatory design to better serve the purposes identified in subsection (h)(1) of maximizing reclamation and minimizing release of HFCs from equipment. With respect to the commenter's reference to reductions in HFC stocks, EPA notes that the HFC phasedown will greatly reduce the overall consumption and production of HFCs but will not eliminate their use in the U.S. market. Therefore, continued introduction of HFC-containing appliances may still occur, and EPA concludes it is appropriate for theses appliances to be subject to these requirements for the reasons described earlier in this response. For these reasons, EPA finds the 15-pound threshold as appropriate for serving the purposes described in subsection (h).

The Agency disagrees with the commenter's assertion that the 15-pound threshold would deter the transition to newer, more efficient refrigerant-containing appliances, as in the Agency's experience several factors inform the decision of whether to replace equipment and if so, what to replace it with (such as the age, functionality, and costs of operating the existing equipment, and the price of new equipment and costs of operating that equipment). EPA notes that the commenter did not provide additional information to support their assertion that such deterrence would actually occur. EPA is not clear on what the commenter is referring to when it says that one of the goal posts of the Act is the replacement of older equipment with newer and more efficient equipment. To the extent the comment is referring to the implementation of subsection (i) of the AIM Act, EPA clarifies that those provisions are out of the scope of this rulemaking and thus any comment addressing those requires no response. To the extent that the comment pertains to appliances subject to the leak repair requirements in this final rule the Agency notes the overall applicability of appliances is subject to whether or not they contain an HFC or substitute for an HFC with a GWP greater than 53. The final 2023 Technology Transitions Rule applies certain GWP-based restrictions on use of HFCs in new equipment in certain sectors or subsectors in which those HFCs are used. If an equipment owner were to decide to replace a refrigerant-containing appliance above the 15-pound threshold with a new refrigerant-containing appliance that is subject to under 2023 Technology Transitions Rule, they would need to consider compliance with those requirements. If they also wish to avoid the applicability of leak repair requirements established in this rule to the new appliance, they may have options that would achieve that goal. For example, an owner or operator may be able to select an appliance that uses a refrigerant that does not contain an HFC or a substitute with a GWP greater than 53. However, if they are selecting a refrigerant-containing appliance that uses HFCs, it would not serve the purposes identified in subsection (h)(1) of maximizing reclamation and minimizing release of HFCs from equipment to allow that refrigerant-containing appliance to avoid application of the leak repair requirements simply because it is new, even it is more efficient. Thus, their inclusion in the leak repair requirements at the 15-pound threshold is warranted.

Comment: One commenter stated that many food industry leaders are part of the GreenChill voluntary partnership that made charge size reduction a priority and challenged equipment manufacturers to lower the amount of refrigerant needed in the retail food industry. The commenter asserted that the current charge size threshold of 50 pounds has served as a motivation to select lower-charge appliances, which leak less refrigerant in situations where catastrophic leaks occur and stated that the proposed threshold penalizes food retailers for the progress under the GreenChill partnership. The commenter asserts that the lower threshold would decrease any motivation for food retailers to purchase expensive appliances that operate at lower charge sizes below 50 pounds. The commenter also expressed concern that many smaller appliances would need to be added to a company's recordkeeping, because appliances not previously covered under section 608 would not have had their full charge data captured.

Another commenter indicated that the provision poses a significant challenge to a cost-conscious industry using centralized HFC systems which are reliable and remain cost-effective for years if well maintained. The commenter asserted that the leak repair requirements would force owners or operators who have recently transitioned to HFO systems to transition again or to cause smaller facilities to transition to fan systems which may paradoxically increase emissions from electricity generation. The commenter also stated that the rule disproportionately impacts owners or operators in States with higher heat indexes and limited alternative chilling methods.

Response: The Agency disagrees that the final rule's 15-pound threshold for leak repair unduly burdens the retail food industry. EPA acknowledges that these newer designs may use both less refrigerant overall and refrigerants with lower-GWPs but disagrees that the leak repair requirements penalize food retailers that have switched to such equipment because these requirements apply equally to equipment subject to the requirements. Furthermore, the Agency has previously stated that the overall reduction in charge size the RACHP sector is part of EPA's rationale for lowering the charge size threshold to 15 pounds. Refrigerant-containing appliances between 15 and 50 pounds still contain HFCs and covered substitutes which have a detrimental effect on the environment. The extension of the leak repair requirements to capture refrigerant-containing appliances between 15 and 50 pounds will ensure that less HFCs are emitted. The Agency responds that the GreenChill partnership is a voluntary partnership program and does not require the supermarket industry as a whole or the partnership to meet specific leak repair requirements. Advancements in refrigerant charge sizes cannot solely be attributed to the GreenChill partnership as appliance manufacturers and supermarket owners had incentives to lower the charge size of supermarket systems to save on refrigerant costs and improve energy efficiency. The Agency, however, does recognize that supermarkets in the GreenChill voluntary partnership are uniquely positioned to meet the leak repair requirements as partners have been able to consistently achieve lower leak rates by adopting newer system technologies, using newer refrigerants, applying best practices, and maintaining leak-tight systems to decrease refrigerant emissions. The Agency also disagrees with the commenters' framing that the 15-pound threshold would disincentivize owners or operators from investing in refrigerant-containing appliances at lower charge sizes. Owners and operators may decide to transition to refrigerant-containing appliances with smaller charge sizes to save money on refrigerant costs and mitigate the potential of leakage characterized by refrigerant-containing appliances at larger charge sizes. EPA does not find that owners or operators

would solely transition to appliances with small charge sizes to avoid leak repair requirements.

EPA also disagrees with one commenter's assertion that owners or operators who have recently transitioned to HFO systems will need to transition again. This final rule is not regulating the transition of refrigerant-containing appliances, rather, the final rule is establishing leak repair requirements for refrigerant-containing appliances with a charge size 15 pounds or greater which use an HFC or substitute for an HFC with a GWP greater than 53. EPA did not propose and is not finalizing requirements for refrigerant-containing appliances to transition or be replaced (unless a refrigerant-containing appliance is not able to be repaired and is subject to the retrofit or retirement requirements described in section IV.C.3.f of this preamble). The Agency views the leak repair requirements of the final rule to provide numerous benefits to owners or operators (*e.g.,* reduced costs to replace lost refrigerants due to leaks). As the commenter stated, HFC centralized systems if well maintained can be reliable and cost-effective for owners and operators and the leak repair requirements of the final rule ensure that these systems are well maintained. Further, owners or operators who are using HFOs or HFO blends are only subject to the leak repair requirements if the refrigerant used contains an HFC or has a GWP greater than 53. For these reasons, the Agency also disagrees that smaller facilities will transition to fan refrigeration systems in order to avoid the leak repair requirements of the final rule. EPA does not foresee fan systems as being a replacement to refrigerant-containing appliances that use HFCs and notes that there are non-HFC alternatives available for certain refrigerant-containing appliances used by the retail food industry.

EPA also disagrees that the leak repair requirements disproportionately impact owners or operators in States with higher heat indexes and limited alternatives. As stated previously, this rule is not requiring the transition to different alternatives or prohibiting the use of HFCs, rather, the rule is establishing requirements to ensure leaks in refrigerant-containing appliances containing HFCs or covered substitutes are repaired in a timely manner. The Agency understands that differences in ambient temperature will affect the need for RACHP appliances, however, the leak repair requirements apply equally to refrigerant-containing appliances regardless of geographic location. Furthermore, the prompt repair and management of refrigerant-containing appliances in States with higher heat indexes where RACHP is utilized more, will help save owners and operators costs associated with leaky appliances.

EPA is finalizing as proposed, the exemption of the residential and light commercial air conditioning and heat pump subsector [60] from the leak repair provisions in the final rule. This subsector is categorized by refrigerant-containing appliances that are used to cool individual rooms, single-family homes, and small commercial buildings. The Agency notes that the description of the subsector is consistent with the description used by the SNAP program since 2009,[61] owners or operators should be familiar with the terminology and implementation under the SNAP program. EPA is not providing a regulatory definition of residential and light commercial air conditioning and heat pumps and clarifies that we are using the terminology developed by SNAP to denote the types of refrigerant-containing appliances that would be considered to fall under the subsector. The determination of whether or not a refrigerant-containing appliance is exempt from the leak repair provision is reliant on such appliances being considered to fall within the parameters of the terminology. As described in the proposal, the vast majority of refrigerant-containing appliances in the residential and light air conditioning subsector typically have a charge size of less than 15 pounds; however, EPA is providing an exemption in the case that an appliance is used within this subsector with a charge size of 15 pounds or more. These refrigerant-containing appliances are used in residences (but this subsector does not include larger centrally-cooled apartment/condominium buildings—where a chiller is likely used), and small retail and office buildings. The types of specific refrigerant-containing appliances used in this subsector could include but are not limited to:

- Packaged terminal air conditioners (PTACs);
- Variable refrigerant flow (VRF) appliances;
- Unitary air conditioning; and
- Some rooftop air conditioning.

There are several reasons for this exemption. Since the majority of appliances in this subsector have a refrigerant charge below the 15-pound cutoff for leak repair requirements, enforcement of these appliances may be challenging due to the number of appliances that would be covered. Further, the number of refrigerant-containing appliances in this subsector may cause additional strain on contractors and technicians who are necessary to complete the repair of leaking appliances. Therefore, EPA's exemption of appliances in this subsector from the leak repair requirements is administratively more efficient and will facilitate compliance of affected appliances under the provision.

Comment: EPA received generally positive comments on the exemption of residential and light commercial air conditioning with the majority of comments requesting clarity of what appliances are covered by the exemption. One commenter stated that codifying a definition for residential and light commercial air conditioning and heat pumps would avoid confusion in the regulated community. Two commenters requested EPA consider codifying the industry definition of light commercial defined as having a cooling capacity below 65,000 BTU/h. One commenter urged EPA to clarify what it considers a "small commercial building." One commenter stated that EPA should define residential and light commercial refrigeration to be consistent with how SNAP defines the residential and light commercial air conditioning and heat pump subsector. The commenter stated that a definition of light commercial air conditioning consistent with SNAP would exclude chillers but include most other forms of household and commercial cooling. Another commenter requested clarification on whether air conditioning systems for supermarkets would be classified as light commercial and therefore exempt from leak repair requirements. The commenter added that if EPA were to clarify that supermarket air conditioning appliances do not fall under light commercial air

[60] The residential and light commercial air conditioning subsector includes equipment for cooling air in individual rooms, single-family homes, and small commercial buildings, including both self-contained and split systems. Self-contained systems include some rooftop AC units (*e.g.,* those ducted to supply conditioned air to multiple spaces) and many types of room ACs, including packaged terminal air conditioners (PTACs), some rooftop AC units, window AC units, portable room AC units, and wall-mounted self-contained ACs, designed for use in a single room. Split systems include ducted and non-ducted mini-splits (which might also be designed for use in a single room), multi-splits and variable refrigerant flow (VRF) systems, and ducted unitary splits. For additional information on the types of equipment, see EPA's website at *https://www.epa.gov/snap/substitutes-residential-and-light-commercial-air-conditioning-and-heat-pumps.*

[61] This subsector was previously characterized as "household and light commercial air conditioning" (61 FR 4736, February 8, 1996). EPA later revised this subsector's name because it was recognized the "house" might be taken to exclude other types of dwellings, such as apartments.

conditioning, the Agency would need to evaluate the significant cost burdens associated with the decision.

Response: EPA is finalizing the leak repair exemption of residential and light commercial air conditioning and heat pumps. The Agency acknowledges comments in support of the provision. In response to commenters' request that EPA better define residential and light commercial air conditioning and heat pumps the Agency has provided additional description and discussion in the preamble of this rule. EPA clarifies that it is not codifying a definition of the subsector nor is it adopting a 65,000 BTU/h industry standard as one commenter suggested, because we find the additional clarification of the subsector included in the preamble to be sufficient in alleviating potential confusion with what refrigerant-containing appliances are included in the residential and light commercial air conditioning and heat pumps subsector. The Agency reiterates that the majority of appliances subject to this narrow exemption are below the final rule's 15-pound charge size threshold for the leak repair provision. EPA notes that the terminology used for the residential and light commercial air conditioning and heat pumps sector mirrors the terminology created and implemented under the SNAP program under the CAA, which has been used in that context since 2009. As used in the context of SNAP, this residential and light commercial air conditioning and heat pumps end-use includes equipment that cools enclosed spaces in households and commercial premises (excluding chillers) which include room air conditioning such as window units, PTACs and heat pumps, and portable air conditioners; central air conditioners (*i.e.,* ducted); non-ducted systems (both mini and multi splits); packaged rooftop units; water-source and ground-source heat pumps; and other products. Residential and light commercial air conditioning and heat pumps are often distinguished from chillers by the fact that they condition the air directly, rather than cool (or heat) water that is then used to condition air.[62] The Agency intends for the term as used in the context of this rulemaking under subsection (h) to have the same meaning as it has under the SNAP program, given the Agency's experience in regulating this end-use under SNAP and its expectation that the regulated community is familiar with this term and its use under SNAP.

The SNAP terminology is based, in part, on ASHRAE's standard 15–2022 which provides more clarity of what types of occupant spaces that fall into the category of what EPA refers to as residential and light commercial. For "residential occupancy" some premises include but are not limited to dormitories, hotels, multiunit apartments, and private residences. For "commercial occupancy" some premises include office and professional buildings, markets, and other work or storage areas. EPA notes that ASHRAE standards are primarily addressing issues with safety in relation to "residential occupancy" or "commercial occupancy" whereas SNAP is addressing the safety and applicability of specific refrigerants which are determined as acceptable for use in specific end-uses. Further, while these descriptions of "residential occupancy" and "commercial occupancy" are helpful in the determination of the types of premises which may fall within the purview of residential and light commercial, the Agency clarifies that the exemption applies to the categories of refrigerant-containing appliances used at these premises. In this final rule, EPA is using the types of refrigerant-containing appliances described under SNAP's terminology for residential and light commercial air conditioning and heat pumps to determine what refrigerant-containing appliances fall under the exemption. For example, a central air conditioner being used to provide cooling for occupants in a commercial setting that has the same shape, size, and cooling load as a refrigerant-containing appliance used in a residential setting would fall under this exemption. An air conditioning appliance at a light commercial building would most likely be a rooftop AC unit, which is one type of light commercial air conditioning.[63] In addition to rooftop AC units, other types of air conditioners and heat pumps are part of the residential and light commercial AC and HP subsector and hence are exempt from the leak repair requirements, such as single packaged units, split system central air conditioners and heat pumps, window-mounted air conditioners, through-the-wall units, and portable air conditioners. EPA clarifies that the exemption does not apply to a chiller, a type of air conditioning system that is often used to provide comfort cooling to office buildings, malls, stadiums, arenas, hotels, convention centers, airport terminals, etc.

In response to the question regarding supermarket air conditioning, the Agency clarifies that some but not all supermarket air conditioning systems would fall under the definition of residential and light commercial air conditioning based on the refrigerant-containing appliance being used to cool occupants. However, if a supermarket refrigeration rack is providing comfort cooling as well as refrigeration for perishable foods, it would not be exempt from the leak repair requirements (unless it contained less than 15 pounds of a regulated HFC or HFC substitute with a GWP greater than 53) because this type of refrigerant-containing appliance does not fall under the terminology of residential and light commercial AC and HP. With regards to the assertion that there are significant costs if not all supermarket air conditioning systems were exempt from the leak repair requirements, EPA refers the reader to the Economic Impact and Benefits TSD.

Comment: A few commenters suggested that residential and light commercial air conditioning and heat pump systems should not receive an exemption from leak repair requirements. Several commenters specifically called out the need to include VRF systems under the leak repair provision. One commenter highlighted that multi-split RACHP and VRF systems can contain large refrigerant charges, have many points of potential leakage, and may be more limited in regard to low-GWP alternatives. Another commenter requested that commercial rooftop systems with a charge size above five pounds be covered under the leak repair provision. The commenter agreed with the Agency's decision to exclude residential systems but encouraged EPA to establish leak repair requirements for light commercial air conditioning and heat pumps. A separate commenter in support of the exemption suggested that the Agency could revisit the leak repair exemption for residential air conditioning and heat pump systems at a future date as leak detection solutions become available and cost-effective for these systems.

Response: EPA disagrees with comments requesting that the exemption for residential and light

[62] SNAP Notice 23 (January 2, 2009; 74 FR 21).

[63] The Technology Transitions Rule describes rooftop AC units as products that combine the compressor, condenser, evaporator, and a fan for ventilation in a single package and may contain additional components for filtration and dehumidification. Most units also include dampers to control air intake. Rooftop AC units cool or heat outside air that is then delivered to the space directly through the ceiling or through a duct network. Rooftop AC units are common in small commercial buildings such as a single store in a mall with no indoor passageways between stores. They can also be set up in an array to provide cooling or heating throughout a larger commercial establishment such as a department store or supermarket. *https://www.federalregister.gov/d/2023-22529/p-903.*

commercial air conditioning not be finalized. In the context of the 608 ODS regulations, residential and light commercial air conditioning were not anticipated to be affected by the leak repair provisions because of the regulation's 50-pound charge size threshold. Under the authority of the AIM Act, EPA sought to align with the 608 regulations where appropriate and to lower the charge size threshold to 15 pounds for reasons as further discussed in section IV.C.1 of the preamble. In the proposed rule, EPA recognized that a lower leak repair charge size threshold might implicate appliances that are used in the residential and light commercial air conditioning subsector that were not previously subject to leak repair requirements. The Agency notes that the inclusion of refrigerant-containing appliances would greatly expand the number of refrigerant-containing appliances subject to the leak repair requirements and may make the enforcement of the leak repair provisions inefficient. While a portion of the refrigerant-containing appliances used in the residential air conditioning subsector may have charge sizes above 15 pounds, the Agency found it prudent to not require wide breadth of leak repair for this category of appliances in the final rule. The Agency also notes that the specific exclusion of residential air conditioning may ease implementation for this first rule under subsection (h). With a similar reasoning, the Agency notes similar concerns would arise from making appliances commonly used in light commercial air conditioning (*e.g.,* central air conditioners, rooftop AC units, etc.) adhere to the leak repair requirements. For these reasons the Agency disagrees with one commenter's recommendation to apply the leak repair requirements to light commercial rooftop systems with a charge size greater than five pounds. As one commenter indicated, leak detection could be less costly in the future. The Agency agrees it could, in a future notice-and-comment rulemaking, reconsider the leak repair exemption for residential and light commercial air conditioning and heat pumps.

While EPA agrees that VRF appliances could have higher refrigerant charge sizes, the Agency disagrees that VRF appliances should be excluded from the exemption for leak repair as VRF is a general term describing a type of appliance which is included in the description of the residential and light commercial air conditioning and heat pumps subsector. VRF appliances are refrigerant-containing appliances that can handle differentiated loads. EPA is using the SNAP terminology to determine the categories of refrigerant-containing appliances that are exempt from the leak repair provision; VRF appliances have been considered to be part of that SNAP terminology. In the 2023 Technology Transitions Rule, VRF appliances above 65,000 BTU/h were split off from the residential and light commercial AC and HP subsector, and defined as its own subsector, in part because of the complexity of the design and installation of larger VRF systems. The additional year was given to ensure the effective transition to lower-GWP alternatives in the subsector. Further, annual industry estimates by AHRI[64] show that refrigerant-containing appliances with capacities of 65,000 BTU/h or more constitute roughly three percent of all residential and light commercial refrigerant-containing appliances sold. VRF appliances of this size are a subset of this three percent. Additionally, EPA did not propose and is not finalizing to separate VRF appliances from the leak repair exemption for the residential and light commercial AC and HP subsector. EPA in a future notice-and-comment rulemaking may reconsider the inclusion of certain VRF appliances which currently are exempt from the leak repair requirements of this final rule.

The Agency is requiring leak repair provisions for new and existing passenger buses,[65] including school, coach, transit, and trolley buses with charge sizes at or above 15 pounds. The heavy-duty vehicle category [66] incorporates all motor vehicles with a gross vehicle weight rating of 8,500 pounds or greater. Air conditioning systems used to cool passenger compartments in these buses mainly use HFC–134a or R–407C,[67] and are typically manufactured as a separate unit that is pre-charged with refrigerant and installed onto the vehicle in a separate enclosure (*e.g.,* roof mounted). The refrigerant charge for these systems is larger than those for other MVAC systems (*e.g.,* light-duty motor vehicles), typically ranging from 15 to 30 pounds. MVAC systems used to cool passenger compartments in light-duty, medium-duty, heavy-duty on-road and nonroad (off-road) vehicles are typically charged during vehicle manufacture and the main components are connected by flexible refrigerant lines. MVAC systems in these vehicles typically have charge sizes ranging from one to eight pounds depending on the manufacturer and cab size.[68] [69]

Comment: One commenter expressed support for EPA's inclusion of MVAC systems with charge sizes over 15 pounds in the leak repair provisions. The commenter asserted that these MVAC systems, such as those on buses and trains, may lose large amounts of refrigerant over time.

Response: EPA acknowledges the commenter's support for this provision and is finalizing the requirement for MVAC and MVAC-like appliances.

Comment: A commenter questioned the authority of EPA to regulate the commercial aviation sector, including refrigerant-containing appliances aboard aircraft and at airports and hangars. The commenter stated that the Federal Aviation Administration (FAA) has the authority and responsibility to ensure such requirements do not adversely affect efficient operation and aircraft safety. The commenter asserted that EPA has not coordinated with the FAA regarding the potential application of the rule's requirements. Additionally, the commenter stated that the proposed rule lacked clarity regarding how the rule would apply to the commercial aircraft sector and questioned why the rule did not exempt the commercial aviation sector from the leak repair and ALD requirements. Lastly, the commenter stated the proposed rule did not provide sufficient time for the sector to safely comply with the rule's leak repair requirements and specified that EPA must extend the applicable leak repair compliance deadlines for commercial aircraft.

Response: EPA disagrees with the commenter's broad assertion that EPA does not have the authority to issue regulations pertaining to aircraft and aircraft operations. While EPA agrees that the FAA has jurisdiction over matters related to aircraft safety and operations consistent with its Congressionally mandated authorities,

[64] AHRI 2024; available at: *https://www.ahrinet.org/analytics/statistics/historical-data/central-air-conditioners-and-air-source-heat-pumps.*

[65] "Bus" is defined at 40 CFR 1037.801 and means "a heavy-duty vehicle designed to carry more than 15 passengers. Buses may include coach buses, school buses, and urban transit buses."

[66] Defined at 40 CFR 86.1803–01.

[67] Chemours, Freon™ Refrigerant for Bus and Rail Air Conditioning; available at: *https://www.freon.com/en/industries/stationary-ac-heat-pumps/public-transport-ac.*

[68] ICF, 2016. Technical Support Document for Acceptability Listing of HFO–1234yf for Motor Vehicle Air Conditioning in Limited Heavy-Duty Applications. Available at: *https://www.regulations.gov/document/EPA-HQ-OAR-2015-0663-0007.*

[69] EPA, 2021. Basic Information about the Emission Standards Reference Guide for On-road and Nonroad Vehicles and Engines. Available at *https://www.epa.gov/emission-standards-reference-guide/basic-information-about-emission-standards-reference-guide-road.*

under CAA Title VI and the AIM Act, EPA has issued numerous regulations that concern the use of ODS and HFCs in many applications including onboard aviation and flight operations. With respect to this action, the AIM Act does not exclude aircraft or aircraft operations from the scope of implementing regulations. Notably, the inclusion in subsection (e)(4)(B)(iv) of the statute of ''on board aerospace fire suppression'' which includes aircraft,[70] indicates that Congress did not intend to exempt aircraft and aircraft operations from the AIM Act. In addition, the commenter does not address the provisions of subsection (h) itself. None of the text of subsection (h) indicates that Congress contemplated that these provisions would not apply to equipment used in commercial aviation. Congress expressly addressed inapplicability of regulations under (h) in subsection (h)(4), in which it provided that regulations under subsection (h) shall not apply to HFCs or their substitutes contained in foams. If Congress had intended to exclude equipment used in commercial aviation from regulations promulgated under subsection (h), it would be reasonable to expect that the statute would include similar language creating that exclusion. Although the comments do not appear to base their objections on the text of subsection (h), to the extent they intend to claim that this rulemaking exceeds EPA's authority under that provision, EPA notes that it is establishing the subsection (h) requirements in this final action to control practices, processes, or activities regarding the service, repair, disposal, or installation of equipment that involves a regulated substance or a substitute for a regulated substance and to serve the statutory purposes identified in subsection (h). Thus, this final action is within the scope of EPA's authority under subsection (h)(1), including as it pertains to equipment used in commercial aviation.

With respect to the commenters' assertions that finalizing the proposed rule would conflict with the Federal Aviation Act's statutory purpose and scheme and that this statute reserves to the FAA jurisdiction over matters related to aircraft safety and operations and broadly preempts the field of regulation with respect to commercial aviation, aircraft operations, and aircraft safety, EPA responds that the information presented in the comment letter does not indicate that EPA is generally precluded from including requirements related to the commercial aviation sector in this rulemaking. The comment cites and quotes cases that speak to the pervasive nature of Federal regulation in this area and address the preemption of State and local regulations. However, preemption of State and local laws is not relevant to EPA's authority to establish regulations under the AIM Act.

In response to the commenter's assertions that EPA did not consult with the FAA on these regulations, particularly for any leak repair requirements that may apply to the commercial aviation sector, the Agency notes that it reached out to FAA on certain topics in developing the draft final rule prior to interagency review.[71] Further, FAA and other Federal agencies had an opportunity to review a draft of the final rule during interagency review. The Agency also notes that these leak repair provisions mostly align with the regulations under CAA section 608. For decades these rules have applied to the refrigeration and air conditioning appliances at airports and within aircraft hangers, and the Agency has considered commercial aircraft to be non-MVAC appliances covered under CAA section 608. The Agency also disagrees with the commenter's argument that owners and operators in the commercial aviation sector do not have enough time to safely comply with the provision. EPA notes that the 30-day timeframe timeline for repairs is the same as in the CAA section 608 rules, which does not exempt the commercial aviation sector. The leak repair provisions also provide owners or operators the ability to submit extension requests if some unforeseen circumstances (*e.g.,* necessary components to complete leak repair are unavailable during the 30-day leak repair timeframe) prohibit an owner or operator from completing leak repair within the normal 30-day timeframe. Moreover, the comment also did not provide substantive evidence as to why aircraft owners and operators would not be able to safely comply with the leak repair provisions, nor did the commenter identify any information that suggests that these requirements would adversely affect the proper functioning of aircraft air conditioning.

Finally, EPA notes that the 2023 Technology Transitions Rule provided a temporary exclusion to onboard galley refrigeration on aircraft due to their unique operating environment and the fact that these units are subject to FAA's design and installation requirements under 40 CFR 25.1365. The Agency clarified the intention to revisit this application through a notice-and-comment rulemaking no later than five years after the compliance date for retail food refrigeration-stand-alone units—*i.e.,* no later than January 1, 2030. The temporary exclusion for this specific application was given in the context of subsection (i) and the transition of sectors and subsectors to lower-GWP alternatives. However as previously discussed elsewhere, the criteria and purposes of subsection (i) and (h) are different. This rulemaking is finalizing leak repair requirements for the purposes of minimizing the release of regulated substances from equipment and maximizing the reclamation of regulated substances. The repair of leaks does not have the same implications for the design and installation of refrigerant-containing appliances as restrictions on the use of higher-GWP HFC refrigerants. The Agency also notes that the exemption for onboard galley refrigeration does not extend to ground-based appliances used by the commercial aviation industry because maintenance and ground operations are not subject to the same FAA requirements as onboard galley refrigeration. Likewise, the repair of leaks in appliances used in ground and maintenance operations (*e.g.,* aircraft hangers) are not exempt from the leak repair requirements in this final rule, nor are they out of the scope of EPA's authority to regulate appliances at airports or aboard aircraft. With these considerations EPA finds it appropriate to apply the leak repair requirements to the commercial aviation sector.

The Agency is finalizing a compliance date of January 1, 2026, for all appliances with charge sizes of 15 pounds or more of a refrigerant containing an HFC or a substitute for an HFC with a GWP greater than 53, including for such appliances with a charge size of 50 pounds or more, which is a modification from the proposal. In the proposal, the Agency proposed a compliance date of 60 days from publication in the **Federal Register** for appliances with a charge size above 50 pounds and a compliance date of one year from the final rule's publication in the **Federal Register** for appliances with a charge size between 15 and 50

[70] EPA's regulations at 40 CFR 84.3 define *on board aerospace fire suppression* to mean ''use of a regulated substance in fire suppression equipment used on board commercial and general aviation aircraft, including commercial-derivative aircraft for military use; rotorcraft; and space vehicles. On board commercial aviation fire suppression systems are installed throughout mainline and regional passenger and freighter aircraft, including engine nacelles, auxiliary power units (APUs), lavatory trash receptacles, baggage/crew compartments, and handheld extinguishers.''

[71] See memo titled *EPA Questions to FAA,* which is available in the docket for this rulemaking, EPA–HQ–OAR–2022–0606.

pounds. EPA reasoned that the compliance date for appliances above 50 pounds could be sooner because the leak repair provisions in the final rule are similar to those that have been in place, for some time, for ODS-containing appliances at or above a full charge size of 50 pounds. Further, prior to the rescission in 2020 (85 FR 14150, March 11, 2020), the final rulemaking under CAA section 608 in 2016 (81 FR 82272, November 18, 2016) applied leak repair provisions for HFC-containing appliances with a charge size of 50 pounds or greater. The 2016 CAA Section 608 Rule became effective on January 1, 2017, and the relevant leak repair requirements for HFCs and other ODS substitutes (now rescinded) applied as of January 1, 2019 (81 FR 82272, 82356, November 18, 2016). Thus, the Agency reasoned that industry was, at a minimum, familiar with the leak repair provisions under CAA section 608, which are similar to the leak repair requirements established under subsection (h) in this action. In regard to refrigerant-containing appliances with a full charge that is at least 15 pounds but less than 50 pounds, the proposal included a slightly longer compliance timeline, as EPA had not previously required leak repair for these appliances. The additional time was intended to allow the regulated community time to familiarize themselves with the requirements and make preparations to comply with them.

Based on further consideration and information provided by commenters, EPA is finalizing a single compliance date, January 1, 2026, to provide owners and operators additional time to comply with the leak repair provisions in the final rule. EPA concludes that this additional time will allow parts of the regulated community that may not have previously had to comply with the leak repair requirements under CAA section 608 time to familiarize themselves with the provisions. While EPA still finds, as at proposal, that parts of the regulated community are already familiar with the requirements based on their experience with similar requirements under CAA section 608, EPA concludes that they would also benefit from additional time to prepare for compliance. During the interim period before the leak repair requirements go into effect, owners or operators can begin determining which refrigerant-containing appliances within a facility will be subject to the leak repair requirements, including conducting inventories, determining the refrigerants used within said appliances, and determining the full charge of refrigerant-containing appliances in their ownership. EPA does not expect this process to take an exceptional amount of time; however, the extension to the compliance date is being provided to ensure owners and operators can complete the necessary steps to prepare for the leak repair requirements, consistent with this final rule.

Comment: The Agency received mixed comments on the proposed compliance date for the leak repair provisions with the majority of comments asking EPA to re-evaluate the proposed timeline and provide additional time to comply with the leak repair requirements. Commenters suggested a longer period to allow manufacturers, facility owners and operators, and other stakeholders sufficient time to prepare for the regulations. Suggested compliance timelines ranged from an additional one to three years, with some commenters suggesting staggered compliance timelines based on charge size. One commenter stated that a compliance date after three years from the rule's finalization would be needed for stakeholders to plan, procure, and implement the leak detection and repair requirements. Another commenter suggested a compliance date two years after finalization so that owners and operators of smaller equipment who may have not previously experienced leak repair requirements could design, procure, set up, and implement a refrigerant management program.

One commenter in support of the proposed compliance date noted that California has had similar requirements for appliances using more than 50 pounds of HFC refrigerants since 2011, highlighting that nationwide appliances using more than 50 pounds of ODS refrigerants have had similar rules for several years. Another commenter suggested both appliance categories (*i.e.,* 50 pounds and greater, and 15 to 50 pounds) should have the same compliance date of one year after the date of the final rule. The commenter also asserted that appliances with a charge size of above 50 pounds that are using 100 percent substitute refrigerants will need additional time to conduct inventory, determine the applicability of appliances using substitute refrigerants, and determine the full charge of appliances. The commenter suggested that this strategy would avoid market confusion by having multiple compliance dates. One commenter, in general support of the leak repair provision, stated the proposal's compliance timeline presumes that the regulated community is familiar with the leak repair provision promulgated under the CAA. The commenter stated that a number of new facility owners or operators have little to no experience with the CAA section 608 regulations and requirements.

Response: Based on further consideration and informed by the comments, the Agency is finalizing a single compliance date, rather than two dates for the leak repair requirements for appliances with a charge size of 15 pounds or more. The Agency is providing additional time from what was proposed in both instances for owners and operators to prepare to comply with the leak repair requirements. EPA disagrees that a staggered compliance date would cause market confusion, as the Agency has previously implemented staggered compliance dates for a number of reasons. For example, the ALD provision in this final rule has a staggered compliance date for new and existing IPR and commercial refrigeration systems with a full charge of 1,500 pounds or greater to ensure, among other considerations, that adequate supply is available for owners and operators to comply with this provision.

The Agency agrees additional time may be necessary for the owners and operators to prepare to comply with the leak repair provisions in this final rule, specifically for owners or operators that may not have been subject to the CAA section 608 requirements during the three-year period described in this section. The Agency disagrees with one commenter's claim that new facility owners would not be aware of the leak repair provisions under the CAA. Before the rescission of the CAA section 608 requirements in 2020, facility owners using appliances containing ODS substitutes (*e.g.,* HFCs) would have been subject to the leak repair requirements under the CAA for three years. The Agency also notes that not all portions of the 2016 CAA Section 608 Rule were rescinded in the 2020 rule. For example, owners and operators utilizing ODS substitutes, including HFCs, are subject to the venting prohibition (40 CFR 82.154). Thus, owners or operators now subject to the leak repair provisions in this rule should be well acquainted with similar requirements under CAA part 82, subpart F or at a minimum, generally aware of the leak repair requirements under CAA part 82, subpart F. While EPA generally disagrees that newer facility owners are not aware of previous requirements for HFCs or requirements for ODS, to the extent this is true, the Agency provided notice in the proposal with regards to the potential to finalize leak repair

requirements for refrigerant-containing appliances containing HFCs and HFC substitutes with a GWP above 53 and is finalizing a later compliance date allowing more time for owners and operators to familiarize themselves with the requirements.

The Agency disagrees that compliance dates beyond January 1, 2026 (*e.g.,* 18 months, two years, three years), are needed in order for owners or operators to comply with the leak repair provision. EPA determined that one year should be sufficient to prepare for the leak repair provision. As discussed previously, the leak repair requirements, aside from the charge size threshold and the limited ALD installation and use requirements, are mostly aligned with the leak repair requirements for ODS under the CAA. Further, the Agency finds the timing of the compliance date to be appropriate, considering the phasedown of HFCs, and does not find it appropriate to delay leak repair of refrigerant-containing appliances that serve the purposes described in subsection (h)(1). Commenters stated that owners and operators need time to plan, procure, and implement the leak repair and detection requirements; however, the commenters did not provide analysis to show that owners and operators would not be able to comply with the leak repair provisions by January 1, 2026, or why any of the longer time frames suggested by commenters would be necessary for compliance. For similar reasons, EPA disagrees with commenters requesting additional time and staggered compliance dates based on charge size. The Agency understands that to some extent, owners and operators may need to conduct inventories of refrigerant-containing appliances under their ownership and determine which appliances are subject to the leak repair provision (i.*e.,* applicability of refrigerant-containing appliances in regard to charge size and refrigerant being used). The Agency does not view this process to take an exceptional amount of time, as owners or operators should be aware of the full charge and type of refrigerant contained in an appliance from previous service records or manufacturer specifications for the refrigerant-containing appliance. The Agency refers owners or operators to section IV.A.1 of this preamble, if they require guidance, for determining the full charge of refrigerant-containing appliances. The Agency also refers owners or operators to section IV.C.1 of this preamble, for further information, regarding the applicability of HFC substitutes to the leak repair requirements in this final rule. Owners or operators have over a year to determine which refrigerant-containing appliances are subject to the leak repair requirements and resolve any uncertainty concerning the applicability of the refrigerant-containing appliances in their ownership.

3. What leak repair provisions is EPA establishing?

EPA is finalizing the leak repair requirements under subsection (h) largely as proposed. The EPA has made some modifications to the proposed requirements to provide greater clarity or consistency among the provisions. These requirements are part of implementing subsection (h)(1) of the AIM Act, as these provisions control practices, processes, or activities regarding servicing or repair of refrigerant-containing appliances, which are a type of equipment, and involve a regulated substance or a substitute for a regulated substance with a GWP greater than 53. As described in section IV.C.2 of this preamble, these leak repair requirements apply to refrigerant-containing appliances with a charge size of 15 pounds or more where the refrigerant contains an HFC or a substitute for an HFC with a GWP greater than 53. The leak repair provisions finalized in this rule will require action if such a refrigerant-containing appliance has been determined to be leaking above the applicable leak rate threshold, pursuant to the regulations. While most of the actions required under the leak repair provisions are triggered by the determination that the refrigerant-containing appliance has leaked above the applicable leak rate threshold, the leak rate calculations and certain recordkeeping requirements apply to refrigerant-containing appliances that are not leaking above the threshold. While EPA is adopting the same applicable leak rates for the leak repair requirements under subsection (h) as applies under 40 CFR 82.157, as described in section IV.C.3.b of this preamble, EPA is also establishing certain provisions that are different from those included in 40 CFR 82.157, that support identifying and potentially repairing leaks sooner (see section IV.D.1 of this preamble for requirements for ALD systems).

In the proposal, EPA reviewed the regulations promulgated under CAA section 608, as codified in 40 CFR part 82, subpart F, addressing the same or similar practices, processes, or activities as addressed in this rulemaking to consider the extent appropriate to coordinate requirements in those regulations with those in this action. Specifically, EPA reviewed the leak repair requirements at 40 CFR 82.157, which do not apply to appliances containing HFCs or their substitutes. The leak repair provisions under CAA section 608 contain requirements for practices, processes, and activities related to identifying and repairing leaks in appliances that contain ODS. As discussed further in this section, EPA concludes that it is appropriate to apply these practices, processes, and activities to appliances containing HFCs and certain substitutes for HFCs under subsection (h). EPA notes that in many cases, the same types of appliances (*e.g.,* chillers, rooftop air conditioning units, supermarket systems) are used, since HFCs are substitutes for ODS. EPA did not propose and is not finalizing new requirements in this action where the provisions in 40 CFR part 82, subpart F already apply to appliances containing HFCs and certain substitutes.

The following subsections provide additional information on the leak repair requirements established by this final rule. Section IV.C.3.a of this preamble provides information on leak rate calculations, which are required whenever refrigerant is added to a refrigerant-containing appliance. The Agency allows owners or operators to use one of two leak rate calculation methodologies to determine the leak rate of a refrigerant-containing appliance and whether repair is required. Section IV.C.3.b of this preamble describes the timeline for leak repair, requests for leak repair extensions, and applicable leak rate thresholds for refrigerant-containing appliances. The exceedance of a refrigerant-containing appliance's leak rate threshold triggers the leak repair requirements of this final rule. Section IV.C.3.c of this preamble provides information on verification testing, which is necessary to determine that the repair of a leaking refrigerant-containing appliance has not failed. Section IV.C.3.d of this preamble describes the timeline for quarterly and annual leak inspections for appliances that have passed the follow-up verification tests described in section IV.C.3. Leak inspections of recently repaired refrigerant-containing appliances ensure that repairs hold and assist in determining if further repair action is required in the event a repair fails. Section IV.C.3.e of this preamble provides information on chronically leaking appliances, which are subject to specific reporting requirements if a refrigerant-containing appliance expends more than 125 percent of its

full charge within a year. Section IV.C.3.f of this preamble describes the process of submitting retrofit or retirement plans to the Agency in the event a refrigerant-containing appliance cannot be repaired within the leak repair timeframe discussed in section IV.C.3. Finally, section IV.C.3.g of this preamble describes recordkeeping and reporting requirements for owners or operators subject to the leak repair requirements of this final rule.

Comment: Several commenters in support of the leak repair and detection requirements supported the Agency's efforts to regulate HFCs, as these requirements broadly enhance activities and practices that further lifecycle refrigerant management (LRM). One of the commenters stated that leak prevention is a cornerstone of LRM and stated that the Agency has clear authority under the AIM Act to promulgate robust leak prevention regulations that support LRM.

Response: EPA acknowledges commenters' support for the leak repair and detection requirements in the final rule. While the Agency did not base this rule or its provisions on lifecycle management, EPA agrees that the leak repair and ALD requirements will reduce the severity of leak events, minimizing refrigerant lost. These requirements and other refrigeration management best practices as a part of larger refrigerant management frameworks are important to EPA's implementation of this final rule to serve the purposes described in subsection (h)(1) of minimizing the release of regulated substances. The Agency also agrees that it has the authority under the AIM Act to regulate HFCs and limit their release through the leak repair and ALD requirements in this final rule.

a. Leak Rate Calculations

EPA is adopting the requirements for leak rate calculations under subsection (h) largely as proposed, with some modifications as discussed in this section. Thus, refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53 are required to conduct a leak rate calculation if the appliance is found to be leaking. EPA is also requiring that the leak rate of covered appliances be calculated every time refrigerant is added to an appliance, unless the addition is made immediately following a retrofit, installation of a new appliance, or qualifies as a seasonal variance, as described in this and subsequent sections. EPA is not requiring the repair of all leaks; rather, EPA is requiring repair of leaks such that the appliance is below the applicable leak rate threshold consistent with the requirements at 40 CFR 82.157. The calculation of the leak rate is used to determine whether the appliance is leaking above the applicable threshold, which in turn determines whether further action (*i.e.,* repair) is required. For example, if an appliance owner adds refrigerant to the appliance but does not calculate the leak rate, the owner would have no means of determining if the appliance's leak rate was below the applicable leak rate threshold. Hence, the owner would not know if further action was warranted. Thus, the leak rate calculations are also used to determine compliance with the leak repair requirements. As stated in the proposal, this rulemaking's approach can contribute to minimizing the releases of HFCs or their substitutes by requiring more thorough leak inspections and verified repairs sooner.

In this final rule, the Agency is establishing two leak rate calculation methodologies: the annualizing method and the rolling average method. The utilization of leak rate calculation methodologies is analogous to their use under subpart F. The strength of the annualizing method is that it is future oriented and allows the owner or operator to ''close out'' each leak event so long as the requirements are followed and does not lump past leak events with the current leak event. It considers the amount of time since the last addition of refrigerant and then scales that up to provide a leak rate that projects the amount of refrigerant lost over a whole year if the leak is not fixed. As a result, this formula will yield a higher leak rate for smaller leaks if the amount of time since the last repair was shorter. The rolling average method also has its strengths. It accounts for all refrigerant additions over the past 365 days or since the last successful follow-up verification test showing that all identified leaks were successfully repaired (if less than 365 days). If an owner or operator verifies all identified leaks are repaired, this method allows an owner or operator to ''close out'' a leak event. If there is no follow-up verification test showing that all identified leaks were successfully repaired within the last year, the leak rate would be based completely on actual leaks in the past year. Owners and operators are provided the flexibility to choose which methodology is most advantageous to their operations. However, under this final rule once a methodology is chosen, the owner or operator must continue using the same methodology, so leak rate calculations remain consistent. Further, under this final rule, owners or operators are to use the same leak rate calculation methodologies for all affected appliances at a facility. The two methods use two different paradigms to determine leak rate—one is forward-looking/predictive, while the other is backward-looking/retrospective. If an owner or operator were to switch between methods, they would not get an accurate calculation because the time frame being evaluated would be different for each method. In either methodology, EPA is establishing that when calculating the leak rate, any purged refrigerant that is destroyed is not counted towards the leak rate. To qualify for this exemption, the purged refrigerant must be destroyed at a verifiable destruction efficiency of 98 percent or greater and the owner or operator must meet certain recordkeeping requirements for the amount of refrigerant sent for destruction.

EPA is allowing a narrow exception for owners or operators to change their leak rate calculation method in the final rule. There may be some cases, such as change of ownership, where an owner or operator may need to change the leak rate calculation method so that all facilities under their ownership are using the same method. EPA views this alignment of the leak rate calculation methodologies across facilities as valuable to consistent management of refrigerant-containing appliances across multiple facilities. In order for an owner or operator to make this change in leak rate calculation, the owner or operator must meet certain conditions. First, the owner or operator must have recently purchased or otherwise acquired a new facility with a refrigerant-containing appliance that was using a different leak rate calculation method than the current leak rate calculation method used by the owner or operator. Second, the owner or operator must ensure the refrigerant-containing appliances at the purchased facility are leaking below the applicable leak rate when the leak rate is calculated using both methodologies. Third, if the leak rate calculation is changed, the owner or operator is required to document why the change was made, the date the change was made, and that the new leak rate calculation methodology is used consistent with the record keeping requirements in 40 CFR 84.106(l)(3). EPA clarifies that an owner or operator cannot change their leak rate calculation if it results in the avoidance of leak repair (*e.g.,* if an appliance

would be over the leak rate threshold using one method and below the threshold using the other method).

Lastly, EPA acknowledges that the leak rate calculation requires prior records in order to calculate the leak rate. Since owners or operators are not required to keep records of additions of refrigerants to an appliance prior to January 1, 2026, owners or operators may calculate leak rates for appliances containing an HFC or HFC substitute with a GWP greater than 53 as though there were no additions prior to that date. For example, if an owner or operator is using the annualizing method for the first addition of refrigerant in calendar year 2026, the second term would be 365/365 (or ''1''). For subsequent additions the second term would be 365 divided by the shorter of the number of days since refrigerant was last added or 365. Alternatively, if an owner or operator is using the rolling average method, for the first addition of refrigerant in calendar year 2026, the numerator would be the pounds of refrigerant added since the shorter of January 1, 2026, or the last successful follow-up verification test, if one was conducted in 2026. For subsequent additions the numerator would be the pounds of refrigerant added since the shorter of 365 days or the last successful follow-up verification test. The Agency clarifies that this method of calculating the leak rate is only allowed when previous records are absent. After the effective date of this provision and the first calculation of an appliance's leak rate, the owner or operator must use the shorter number of days since refrigerant is added or 365 days for subsequent leak rate calculations.

Comment: The Agency received comments in support of the proposed requirements and its alignment with the leak rate calculations under 40 CFR part 82, subpart F. One of the commenters requested that the Agency allow a facility to move from the annualizing method to the rolling average method for appliances regulated under 40 CFR part 82, subpart F, and 40 CFR part 84, subpart C, which is what EPA assumes the commenter intended to cite. The commenter claims that facility owners that had been using the annualizing method prior to the 2016 CAA Section 608 Rule continued to use that method due to the lack of compliance assistance and unknowns regarding technicians' ability to consistently document leak inspections. The commenter suggests that EPA could allow an appliance that has not experienced a leak event in over a year to move to a different leak calculation method.

Response: The Agency acknowledges comments in support of the provision. In response to one commenter's request to allow facility owners to change their leak rate calculation methodology for appliances regulated under 40 CFR part 82, subpart F, and 40 CFR part 84, subpart C, EPA notes that comments related to requirements under 40 CFR part 82, subpart F are outside the scope of this rulemaking and thus require no response. To the extent that the comment pertains to appliances subject to requirements to calculate leak rates under this action, the Agency requires that once a leak rate calculation has been chosen, a facility owner cannot switch to the other method. The leak rate calculation methods use different paradigms to calculate a leak rate, and switching between the two methods would not provide the facility owner with an accurate leak rate calculation. Furthermore, allowing an owner or operator to freely switch between leak calculation methods incentivizes non-compliance with the leak repair requirements in this final rule. As discussed in this section, the two leak rate calculation methodologies are using different time frames (*i.e.,* the annualizing method is prospective, and the rolling average method is retrospective) so switching between the two methods would create inconsistencies.

The Agency is providing a narrow exception for owners or operators to switch their leak rate calculation method in the event of a change in ownership if three conditions are met. First, an owner or operator must have recently purchased or otherwise acquire a separate facility that was using a different leak rate calculation method than the method currently used by the purchaser. Second, the owner or operator must ensure that all refrigerant-containing appliances at their facilities are leaking below the applicable leak rate thresholds for said appliances when the leak rate is calculated using both methods. For example, if one supermarket were to purchase another supermarket that was using a different leak rate calculation than the purchaser, the owner or operator may change the leak rate calculation method to ensure that all appliances at their facilities are using the same leak rate calculation. The owner or operator must ensure that refrigerant-containing appliances at both facilities are leaking below the applicable leak rate threshold when calculating the leak rate using both methods (*i.e.,* that there is no exceedance of the leak rate threshold under either method) and must document and keep a record of this change. Third, records of this change must be kept in accordance with 40 CFR 84.106(l)(3). EPA clarifies that an owner or operator may not change their leak rate calculation if it results in the avoidance of leak repair (*e.g.,* if an appliance would be over the leak rate threshold using one method and below it using the other method).

Comment: One commenter did not support the leak rate methodologies in the proposed rule. One commenter stated the methodologies were unduly complicated and resource-intensive and pose significant challenges for companies that have multiple sites with appliances subject to these requirements. The commenter's perspective on the rule led them to believe that each leak must be documented separately, with its own verification test. The commenter further asserted that it would be impossible to know how much refrigerant was lost for each leak and that finalizing the proposed methods would thus be arbitrary and capricious. This commenter suggested that EPA could greatly simplify compliance by allowing owners and operators to calculate leak rates (and by setting compliance obligation triggers) based upon the percentage of total full charge that an appliance has leaked, cumulatively, during a calendar year. The commenter incorrectly stated that this calculation would mirror the process that owners or operators use to calculate whether an appliance is above the 125 percent threshold for chronically leaking appliances. The commenter also requested clarification on the leak calculation if there are two simultaneous leaks.

Response: EPA is finalizing use of the methodologies for leak rate calculations as proposed. The Agency notes that the later compliance date as compared with the proposal should provide time for owners and operators that were not subject to the ODS requirements to familiarize themselves with the leak calculation methods. The Agency disagrees with the commenter's assertion that the methodologies are overly burdensome or complicated. The leak rate calculation methodologies are identical to the requirements in the CAA section 608 regulations that have been successfully used for nearly 30 years (see 1995 CAA Section 608 Rule; 60 FR 40420, August 9, 1995). EPA is providing owners and operators flexibility by allowing them to use either methodology for a facility, and therefore, the owner and operator can select whichever they judge optimal for their specific appliances.

EPA disagrees with the commenter's recommended leak calculation method because the annual calculation of a leak rate would allow for refrigerant to be added throughout the year without the determination of a leak rate. The final rule's basis for leak repair is the determination of whether a leaking appliance has exceeded its applicable leak rate when refrigerant has been added to the appliance, as described in section IV.C.3.b of this preamble. The commenter's proposed method would allow for the unmitigated release of refrigerant in between leak rate calculations and would not achieve the final rule's purpose of minimizing the release of refrigerants from appliances. Further, EPA clarifies that the separate provision for chronically leaking appliances does not mirror the leak calculation provision and does not serve the purpose of ensuring appliances leaking above the applicable leak rate threshold are repaired. As further explained in section IV.C.3.e of this preamble, owners and operators of a chronically leaking appliance (an appliance that leaks more than 125 percent of its full charge in one year) are required to submit an annual report describing the efforts to identify leaks and repair the chronically leaking appliance. This provision is intended to provide information to EPA and further support efforts to minimize releases from chronically leaking appliances, not to determine when appliance repair is required.

EPA also disagrees with the commenter's assertion that the final rule's leak rate calculation methodologies are arbitrary and capricious. This comment appears to be based on a misunderstanding of how the leak rate calculation applies, as the commenter states that it would be impossible to know how much refrigerant was leaked from each individual leak. The Agency clarifies that the leak rate calculation is required when refrigerant is added to an appliance. The leak repair requirements of the final rule are triggered when an appliance reaches a leak rate above the applicable leak rate thresholds described in section IV.C.2.b of this preamble. EPA is not requiring the mandatory repair of all leaks discovered by an appliance owner. The Agency is requiring leak repair for appliances above the applicable leak rate and requiring the appliance owner to conduct leak repairs so that the appliance is leaking below that threshold. While certain documentation is required for individual leaks, that does not mean that the leak rate calculation needs to be applied to each leak individually. The commenter also asked for clarity of the leak rate calculation in the event of multiple simultaneous leaks. EPA responds that simultaneous leaks on the same appliance identified at the same time (*e.g.,* during the same inspection or servicing event) would require just one leak rate calculation. The addition of refrigerant to an appliance triggers the leak rate calculation for the appliance. If the appliance is leaking above the applicable leak rate threshold, the owner or operator must comply with the leak repair requirement and as part of that process may uncover several leaks within an appliance that may require repair in order to bring the appliance under the applicable leak rate threshold.

Comment: One commenter recommended that EPA consider allowing leak rate calculations from indirect ALD systems if acceptable accuracy can be demonstrated at least 85 percent of the time. The commenter claims their manufactured indirect ALD, with reliable data, has the ability to calculate leak rates (in pounds per day) with a margin of error of +/− 25 percent.

Response: EPA acknowledges the suggestion on how indirect ALD could be further used to manage leaks but disagrees that it is an acceptable or viable alternative to the leak rate calculations required by this final rule. Performing a leak rate calculation using one of the methods in the final rule will provide a facility owner with an accurate leak rate to determine if further leak repair action is necessary every time. An approach that need only be demonstrated to be accurate 85 percent of the time, as commenter requested, could result in the failure to identify and address leaks that exceed the leak rate threshold and that this rule intends to address. Additionally, while an indirect ALD system can calculate daily leak rates, the margin of error would cause the leak rate calculation to be inaccurate. The leak rate methodologies provide an accurate snapshot of an appliance's leak rate when refrigerant is added and provides an owner or operator with an immediate determination of whether an appliance needs to be repaired.

Comment: One commenter requested clarification on whether the addition of certain components to existing appliances where refrigerant is added would require a leak rate calculation, using the example of an installation of a new refrigerated case in an existing supermarket system. The commenter indicated the addition would necessitate a charge size adjustment and the addition of new refrigerant to meet the appliances' new BTU/h load. The commenter further stated that in this scenario the refrigerant added to an existing appliance was not to replace leaked refrigerant and that EPA should provide an exception to the leak rate calculation provision in these specific cases.

Response: EPA clarifies that the immediate addition of refrigerant following a retrofit, installation of a new appliance, or seasonal variance does not require a leak rate calculation. The Agency agrees that the addition of refrigerant immediately after additional components are added to an existing appliance does not reflect a leak within the appliances, and thus does not necessitate a leak rate calculation. However, EPA clarifies that a full charge calculation, as outlined in section IV.A.1 of this preamble, must be conducted to determine the change in charge size when additional appliances are added to an existing system. The determination of an appliance's full charge is necessary for subsequent leak rate calculations.

b. Requirement To Repair Leaks, Timing, and Applicable Leak Rates

EPA is finalizing several leak repair requirements related to determining when a leak needs to be repaired, the extent of the repair required, and the timing of such repairs as proposed. EPA is requiring the repair of leaks in refrigerant-containing appliances with a charge size of 15 pounds or more with a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53. Under this rulemaking, owners or operators are required to repair an appliance within 30 days (or 120 days if an industrial process shutdown is required) of refrigerant being added to an appliance, if the appliance is leaking above the applicable leak rate. Leaks must be repaired such that the leak rate of the refrigerant-containing appliance is brought below the applicable leak rate. Depending on the nature of the leaks, it may be necessary to repair or replace multiple components or parts of the refrigerant-containing appliance to comply with this requirement. These requirements are consistent with the requirements found at 40 CFR 82.157(d) to repair leaks for ODS-containing equipment. Repairing leaks in a timely manner helps serve the purposes identified in subsection (h)(1). For example, timely repair is critical to reducing the emissions of refrigerants from leaking appliances, and thus to minimizing releases of HFCs from equipment. In addition, by repairing leaks in a timely manner, additional

HFC refrigerant will be subsequently available for reclamation, which supports maximizing reclaiming of HFCs.

In some unforeseen circumstances, repair of leaks may require additional time beyond that of the 30-day timeframe. EPA is finalizing specific extensions that may be available for owners or operators to repair leaks if certain conditions are met. Among these conditions, EPA is requiring that one or more must be met to qualify for additional time. Extensions for the leak repair requirements are available if the appliance is located in an area subject to radiological contamination or if shutting down the appliance will directly lead to radiological contamination. Additional time is permitted to the extent necessary to allow the completion of the repairs in a safe working environment. Extensions are also available to owners or operators if the requirements of any other Federal, State, local, or tribal regulations make a repair within 30 days (or 120 days if an industrial process shutdown is required) impossible. Additional time is permitted to the extent needed to comply with the applicable regulations. EPA is also finalizing extensions for when needed components that must be replaced as a part of the leak repair are not available within the leak repair timeframe of 30 days (or 120 days if an industrial process shutdown is required). In this case, additional time is permitted of up to 30 days after receiving the needed component, with the total extension not to exceed 180 days (or 270 days if an industrial process shutdown is required) from the date that the appliance exceeded the applicable leak rate. In all cases of potential extensions to the leak repair timeframe, an owner or operator is still required to repair leaks that the technician has identified as significantly contributing to the exceedance of the applicable leak rate and that do not require additional time and to verify those repairs within the initial 30 days (or 120 days if an industrial process shutdown is required). Owners or operators availing themselves of this flexibility are also required to document all repair efforts and provide a reason for the inability to repair the leak within the initial 30-day (or 120-day if an industrial process shutdown is required) time period. All extension requests must be submitted electronically using the Agency's applicable reporting platform and include pertinent information as described in the regulatory text at 40 CFR 84.106.

In the final rule, a leak is presumed to be repaired if there is no further addition of refrigerant to the equipment for 12 months after the date of repair as demonstrated by a successful follow-up verification test or if there are no leaks identified by either the required periodic leak inspection(s) or an ALD system, where applicable. Further information on the requirements for ALD systems are described in section IV.D.1 of this preamble. While EPA is requiring ALD systems for certain refrigerant-containing appliances, there may be some cases where an owner or operator chooses to use ALD systems for equipment where it is not required. Whether use of the ALD system is due to requirements in section IV.D.1 of this preamble or used as a compliance option in lieu of leak inspections (see section IV.C.3.d of this preamble) for a specific appliance, if the ALD system detects a leak in the 12-month period after the date of repair as demonstrated by a successful follow-up verification test, the leak repair would be presumed to have subsequently failed, unless the owner or operator can document that the ALD system leak detection was due to a new leak that is unrelated to the previously repaired leak. Such documentation includes, but is not limited to, the records required to be kept under 40 CFR 84.108(i). Additional information on leak inspections is described in section IV.C.3.d of this preamble. If an appliance is mothballed, the timeframes for repair, inspections, and verification tests are temporarily suspended and will resume when additional refrigerant is added to the appliance (or component of an appliance if the leaking component was isolated).

Comment: EPA received several comments related to the leak repair timeline in the proposed rule. One comment, in support of the leak repair provision, appreciated the clear timeline for leak repair and ability to extend the timeline for repairing leaks to account for delays in component shipments and arrivals. Some commenters requested EPA lower the number of days to repair after initial detection. One commenter suggested the Agency align its leak repair timeline with CARB, requiring leaks to be repaired within 14 days after initial detection to provide additional emissions reductions and reduce refrigerant costs to appliance owners and operators. The commenter shared that between 2020 and 2022, 99 percent of leak repairs under CARB's refrigerant management program were completed within the 14-day window. The commenter preferred EPA set the time extension to 45 days from the date of leak detection for situations where certified technicians or necessary components are not available and when an industrial process shutdown is required. The commenter did not support any extension more than 180 days. Another commenter did not support leak repair extensions for appliances with smaller refrigerant charge sizes.

Response: The Agency acknowledges the comments in support of the provision. The Agency is finalizing the requirements for the timely repair of leaks as proposed, recognizing that these timelines and the potential extensions are consistent with the longstanding requirements under 40 CFR part 82, subpart F. EPA is not finalizing a shorter leak repair timeline in the final rule, as one commenter suggested. The Agency recognizes that leaks often can be adequately repaired in under 30 days, including, as the commenter stated, in as little as 14 days. However, EPA finds it prudent to keep the existing leak repair timeline and extensions in part because EPA anticipates that applying a time frame that is consistent with the leak repair timeline under part 82, subpart F, will facilitate compliance with both regimes and reduce the potential for confusion. The Agency encourages owners or operators to strive to repair leaks as soon as practicable and in less than the required timeframes when possible, so as to, for example, reduce emissions, improve system efficiencies, and avoid spoilage of perishable goods. However, in other circumstances the full 30 days may be needed to adequately complete the repairs, so the final rule's leak repair timeline provides owners or operators with sufficient time and flexibility to repair leaks correctly. The final rule also provides owners or operators an opportunity to extend the leak repair time up to 180 days (270 in the event of an industrial process shutdown) if sufficient reasoning is provided. Additionally, EPA notes that the final rule's leak repair extension provisions encourage the proper repair of an appliance where additional time is needed. In EPA's view, such repairs may include the replacement of major components, if necessary, rather than simply patching those components, an approach that may not be successful in the longer term. Furthermore, some owners or operators may prefer to replace a faulty component before they are required to retrofit or retire an entire appliance and believe this could, in many instances, be an equally effective means to address needed repairs. This extension should also reduce the potentially large burden upon owners or

operators of requiring a large-scale retrofit or retirement when replacing the leaking component might satisfactorily repair the appliance. For these reasons, EPA disagrees with one commenter's recommendation that the Agency adopt a shorter leak repair timeline (*i.e.,* 14 days) or not allow timeline extensions beyond 180 days.

EPA is also not differentiating the leak repair timeline based on charge sizes as one commenter recommended. This final rule lowered the applicable charge size threshold for leak repair to 15 pounds, extending leak repair requirements to refrigerant-containing appliances not previously subject to the leak repair provisions under part 82, subpart F. In this action, the leak repair timeline for all appliances is the same regardless of charge sizes. Although appliances at lower charge sizes may be less complex and easier to repair in a timeframe lower than 30 days, the Agency reiterates the final rule's repair timeline is intended to provide sufficient time to correctly repair appliances below their applicable leak rate thresholds. EPA also notes that smaller refrigerant-containing appliances are not precluded from submitting extension requests as long as the owner/operator has provided sufficient reasoning. The only narrow differentiation in the timing of leak repair in the final rule is for IPR systems in the event of an industrial process shutdown due to the complexity of adequately repairing these refrigerant-containing appliances. Additionally, the Agency views this change as unnecessary because the addition of variable leak repair timelines based on charge size may introduce additional complexity and reduce compliance with the provision. As discussed previously, the leak repair timeline under this final rule is consistent with the leak repair timeline under part 82, subpart F, as a means of facilitating compliance with both regimes and reducing confusion for owners or operators.

Comment: A few commenters requested the compliance timelines for leak repair be extended. Two of the commenters emphasized that the complexity and size of supermarket and IPR systems, the current shortage of technicians, the long lead time for obtaining replacement equipment, and potential operational disruptions will make the leak repair timeline unfeasible. One commenter requested that the timeline extension should not be limited to a maximum of 180 or 270 days because the process to identify and repair a leak in IPR appliances is likely to exceed the applicable timeframes. Another commenter suggested that all but *de minimis* leaks be identified and repaired "promptly" without a specified deadline. The commenter stated that EPA could require an owner/operator to report the progress of leak repair without an arbitrary mandatory deadline. Alternatively, the commenter suggested EPA should not start the leak repair "clock" when a leak is detected but rather when the exact location of a leak is determined, further claiming this would allow technicians time to implement mitigation measures and therefore reduce any incentive for owners and operators to delay repairs. Another commenter suggested EPA could consider an exception process to grant additional time and temporarily or permanently extend the leak repair timeline for situations with technician and component shortages, supply chain disruptions, and other reasonable circumstances.

Response: EPA disagrees with the commenter's recommendation that leak repairs should not have a set timeline for completion or that EPA should consider an exception process. Timely repair of leaks contributes to reducing emissions. As stated in responses to other similar comments, the Agency understands that repairs often happen faster than the designated timelines. Regarding IPR appliances, the Agency is aware, as the commenter stated, that IPR appliances are large and complex and may require additional time or operational shutdowns to determine the leak location. The regulation includes a longer timeline for repairs to IPR, which EPA considers appropriate in light of the differences between IPR and other appliances. Similarly, although supermarket systems and commercial refrigeration systems may be complex, owners or operators should typically be able to repair appliance leaks under the applicable threshold within the final rule's allotted timeframe. For example, the final rule allots up to 180 days for commercial refrigeration appliances (*e.g.,* supermarket systems) to complete repairs in the event necessary components or replacement equipment are not readily available (noting that the owner/operator would need to complete the repair within 30 days of receiving the missing component or replacement equipment).

EPA disagrees that owners or operators would be unable to determine the location of a leak and repair the leak within 30 days (120 days for an industrial process shutdown). As experience with the CAA section 608 programs shows these have been reasonable timelines, including for IPR and commercial refrigeration appliances with charge sizes of 50 pounds or higher. The Agency also notes that extension requests function similarly as they did under the CAA, providing a process for an owner/operator to extend the timeline in the event of technician shortages, component supply issues, and industrial process shutdowns. If an extension is not available and the leak repair requirements cannot be met in the final rule's timeframe (*e.g.,* due to the severity of the leak or condition of the appliance), the owner or operator would need to create a retrofit or retirement plan as described in section IV.C.3.f of this preamble. Allowing for an unlimited time to repair leaks would not provide any incentive for an owner or operator to repair the leak, which would release more refrigerant from the equipment and thus make less HFCs available for recovery from the appliance and reclamation.

EPA also disagrees with one commenter's assertion that the 30-day leak repair timeline is arbitrary. The authority granted to EPA under subsection (h) of the AIM Act directs the Agency to establish certain regulations for purposes including minimizing the release of regulated substances from equipment and maximizing the reclamation of regulated substances. The Agency concludes that the final rule's leak repair timeline is an important component of the leak repair requirements serving these statutory purposes while also providing owners and operators with the flexibility to repair leaks in a timely and efficient manner. The Agency reiterates that the same leak repair timeline has been in effect under the CAA section 608 regulations for decades. For similar reasons, the Agency disagrees with one commenter's suggestion to not start the leak repair "clock" until the exact location of the leak is detected. EPA disagrees that this method of leak repair timing would reduce incentive for owners or operators to delay the repair of leaks. The Agency views the commenter's suggestion as providing an indeterminate amount of time to repair leaks, which in turn incentivizes owners or operators to delay finding and repairing leaks, as the timeline for repair is subject to the discovery of a leak location, not based on the appliance leaking above the applicable leak rate threshold. The final rule provides ample time for owners or operators to determine the source of an appliance's leak and provides additional flexibility to extend the leak repair timeline if certain conditions are met. Thus, the Agency finds the commenter's suggested approach flawed with regard to repairing leaks in a timely manner. The

Agency also disagrees with the commenter's request that EPA require all but *de minimis* leaks to be repaired. In the context of the prohibition on venting or otherwise releasing into the environment any refrigerant under CAA section 608 (40 CFR 82.154), the term ''*de minimis*'' refers to releases associated with good faith attempts to recycle and recover refrigerants, noting that such releases are not subject to the prohibition. In other words, were EPA to require all but *de minimis* leaks to be repaired, and to interpret the term consistently with how it has been interpreted under CAA section 608, the Agency would be finalizing repair of nearly all leaks, not repairs to below a threshold. That would be a significant change that the Agency did not propose and is not finalizing in this rulemaking.

Comment: One commenter suggested that EPA should also consider a condition that the refrigerant must be removed to trigger the proposed leak validation exclusion for mothballed equipment.

Response: EPA is unclear as to what the commenter refers to as a ''leak validation exclusion''; however, we clarify that mothballed appliances must have their refrigerant evacuated before the leak repair timeline is suspended. The definition of ''mothball'' is available at 40 CFR 84.104, which is being finalized in this action, and reads:

Mothball, as it relates to a refrigerant-containing appliance, means to evacuate refrigerant from an appliance, or the affected isolated section or component of an appliance, to at least atmospheric pressure, and to temporarily shut down that appliance.

EPA is finalizing the applicable leak rate thresholds for refrigerant-containing appliances with a charge size of 15 pounds or more with a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53 as follows: 20 percent leak rate for commercial refrigeration equipment; 30 percent leak rate for IPR equipment; and 10 percent leak rate for comfort cooling appliances, refrigerated transport appliances, or other refrigerant-containing appliances not covered as commercial or industrial process refrigeration appliances. The leak rate thresholds are used to determine whether repair is needed for an appliance that is leaking, as the leak repair requirements are triggered if the appliance exceeds the leak rate threshold. *See* 40 CFR 84.106(c)(2). EPA is applying applicable leak rates that mirror those currently in effect for ODS-containing appliances under the 2016 CAA Section 608 Rule. *See* 40 CFR 82.157(c) (d). These rates were in effect for appliances containing 50 pounds or more of HFCs for a period of time. After reviewing the information and analysis that supported application of these leak rates to those HFC appliances and considering the provisions of subsection (h) and the comments offered on the proposal to extend these thresholds to the equipment subject to the leak repair requirements under this rule, EPA has determined it is appropriate to finalize them, as proposed, in this action.

As discussed in section IV.C.2 of this preamble, EPA is finalizing, as proposed, the application of leak repair requirements to appliances using an HFC and/or a substitute for HFCs with a GWP greater than 53, as a refrigerant (neat or in blends) based on a charge size threshold of 15 pounds or greater, with certain exceptions. EPA is requiring the use of the same leak rate threshold across categories of equipment for all covered appliances. In other words, a 20 percent leak trigger rate applies for commercial refrigeration equipment with a full charge size of 15 pounds or more, and a 10 percent trigger leak rate applies for comfort cooling appliances with a full charge size of 15 pounds or more. For refrigerant-containing appliances in certain subsectors and applications that have not been previously covered under 40 CFR 82.157, EPA is finalizing determinations for the applicable leak rates listed in 40 CFR 84.106(c)(2)(iii). For example, for refrigerated transport—rail, EPA is finalizing that this application is considered under the comfort cooling and other appliances category and has an applicable leak rate of 10 percent.

As noted in the proposal, EPA views these applicable leak rates per the type of appliance as appropriate for the leak repair provisions in this action under subsection (h) of the AIM Act. This rulemaking draws on EPA's experience implementing similar requirements under CAA section 608, where these thresholds have provided a practical and effective method for determining when leaks must be repaired. In the proposal, the Agency considered whether a lower percent leak rate for some or all of the categories of appliances would be more appropriate for appliances that contain HFCs and/or substitutes for HFCs. EPA reviewed the docket for the 2016 CAA Section 608 Rule, which lowered the applicable leak rates for each of the appliance categories.[72] [73] EPA also evaluated leak rate data of appliances in each of the applicable categories to determine the appropriate applicable leak rates and reviewed information from stakeholders shared during public meetings held in the development of this rulemaking.[74] EPA did not propose and is not finalizing changes to the applicable leak rates for categories of appliances containing HFCs and covered substitutes. However, the Agency notes that we could revisit the applicable leak rates as appropriate to support the overall purposes of subsection (h) in the future.

Comment: EPA received mixed support for the applicable leak rates for commercial refrigeration, IPR, and comfort cooling. Some commenters stated that EPA could go lower for some of the appliance sectors, and others suggested that EPA increase the leak rate thresholds for certain subsectors. One commenter, in support of the provision, stated that leak rate thresholds aligned with the CAA section 608 regulations are appropriate and should not be further adjusted. Another commenter echoed that the leak rate thresholds did not need to be changed because the final rule would already subject a large group of appliances to mandatory time-limited repairs, reporting, and in some cases, retrofit or retirement. The same commenter stated that lowering the leak rate threshold would make appliances impossible to manage due to the number of appliances affected by the leak repair provisions in the final rule.

Two commenters did not support the proposed leak rates, citing difficulty to manage, the number of systems it would affect from the outset, and impracticality and burden of the requirements. One commenter stated that small chillers used in the semiconductor industry are not applicable to the provision because leaking chillers are normally removed from service. The commenter requested clarity on whether equipment removed from service is exempt from the leak repair requirement. One of the commenters stated that typical food retail refrigeration appliances have an estimated 25 percent annual leak rate and the rule would force the average supermarket system into immediate repair, verification, and potential retrofit or retirement. The commenter also

[72] Docket No. EPA–HQ–OAR–2015–0453

[73] For further information, please see the discussion in the 2016 CAA Section 608 Rule at 81 FR 82272, 82317 and the technical support document, Analysis of the Economic Impact and Benefits of Final Revisions to the National Recycling and Emission Reduction Program, available in the docket for the 2016 CAA Section 608 Rule (EPA–HQ–OAR–2015–0453)

[74] EPA held stakeholder meetings for public input on November 9, 2022, and March 16, 2023, and also solicited feedback through a webinar for EPA's GreenChill Partnership program on April 12, 2023.

suggested EPA eliminate the leak rate thresholds altogether and allow operators to perform a calendar year leak rate calculation each time the operator adds refrigerant, as owners or operators are incentivized to repair leaks to avoid high refrigerant costs and store operations.

Several commenters did not support EPA's proposed leak rate threshold of 20 percent for commercial refrigeration appliances and suggested lower targets to ensure climate and economic benefits. Commenters recommended EPA lower the applicable leak rate to 15 percent. One commenter incorrectly stated that the GreenChill voluntary program requires a maximum 15 percent leak rate for stores and 5 percent for the platinum standard, which over half of certified stores in this program have achieved.

EPA received similar comments regarding the 30 percent leak rate threshold for IPR. Several commenters recommended EPA lower the applicable leak rate for IPR to 20 percent. The commenters also stated that the 20 percent threshold would align with CARB's refrigerant management program and push more facilities to require mandatory repairs. One commenter stated that an IPR system can leak a quarter of its full charge without triggering any leak repair requirements. The commenter asserted that a facility leaking 25 percent of its refrigerant annually will leak out five times as much refrigerant over the course of its life as will be available to recover when it is eventually retired. The commenter also stated that trigger leak rates create a perverse incentive for underreporting and repairing leaks and suggested the Agency revisit these thresholds in the future. Another commenter suggested EPA instate a 10 percent leak rate for IPR chillers specifically because they are compact, sealed appliances with a similar design to comfort cooling appliances that have a 10 percent leak rate threshold. Another commenter suggested the IPR and comfort cooling leak rates should align with Washington State's requirements of 24 percent and 8 percent, respectively. The commenter also urged EPA to consider setting a time frame to revisit reducing these leak thresholds to provide greater climate benefits and guarantee that leak detection systems meet minimum standards.

Response: The Agency is finalizing the leak rate thresholds as proposed. When developing the proposed rule, the Agency considered a number of options for the appropriate leak rate thresholds for commercial refrigeration, IPR, and comfort cooling and decided on proposed requirements that were consistent with the trigger rates that were finalized in the 2016 CAA Section 608 Rule. Under the 2016 CAA Section 608 Rule, EPA determined that lowering the leak rate thresholds was reasonable when considering the compliance costs, savings, environmental benefits and fewer emissions of both ODS and, at the time, non-exempt substitute refrigerants (*e.g.,* HFCs). The Agency found it prudent to align the leak rate thresholds in this final rule with CAA section 608 based on similar factors. Further, the alignment of this provision with leak rate thresholds under CAA section 608 should assist in facilitating compliance with the provision, as owner/operators should be familiar with the similar requirements under CAA section 608. EPA also notes that this rulemaking extends the leak repair requirements to a larger group of appliances that were previously not subject to the leak repair requirements under CAA section 608. The Agency wants to ensure that all appliances subject to the leak repair requirements are able to meet the standards in the provision, and lowering the leak rates at this time may further limit compliance with the provisions of this final rule. Commenters' views include those expressing support for consistency and those suggesting more or less stringent trigger rates. None of these commenters provided sufficient information to conclude that a more or less stringent trigger rate is appropriate. Therefore, EPA is finalizing, as proposed, trigger rates that generally align with 40 CFR part 82, subpart F, in agreement with commenters indicating a preference for consistency. EPA notes that we may revisit the leak rate thresholds in the future through a separate notice-and-comment rulemaking if the Agency finds that the alternate thresholds suggested by commenters are warranted. Furthermore, the Agency disagrees with one commenter's argument that leak rate thresholds create perverse incentives to underreport leaks and avoid repair of appliances. Leak rate thresholds have been utilized as a method of compliance for leak repair for nearly 30 years under the rationale that fixing all leaks in an appliance may hamper compliance and force appliances into early retrofit or retirement before the end of their useful life. EPA acknowledges that, for example, small pin hole leaks in a complex IPR system may be hard to find and repair and ultimately have a low leak rate compared to larger leak events that push a refrigerant-containing appliance above the applicable leak rate threshold. As stated previously in the preamble, when the applicable leak rate is exceeded, repairing those leaks is warranted to minimize the release of refrigerants from equipment.

EPA disagrees with commenters' assertions that the leak rate thresholds would be unduly burdensome. While there are more affected appliances under this final rule given the lower charge size threshold compared to ODS appliances, the Agency notes that on the whole, commenters supported that 15-pound threshold. Moreover, there have been changes to the appliance design since the Agency first established leak repair requirements for ODS refrigerant-containing appliances. The Agency does not view applying the leak repair provisions in this final rule, specifically the applicable leak rate threshold, to appliances with a charge size between 15 and 50 pounds as unduly burdensome. Many of the appliances with a charge size under 50 pounds have an applicable leak rate of 10 percent (*e.g.,* appliances that are not IPR or commercial refrigeration); however, refrigerant-containing appliances at this charge size are at a relatively low risk of leaking compared to larger appliances. Additionally, appliances closer to a charge size of 15 pounds are also more likely to be hermetically sealed and thus have a low leak potential. Furthermore, as detailed in IV.C.2 of this preamble, EPA has provided a narrow exemption from the leak repair provision for residential and light commercial air conditioning and heat pumps, which will further limit the number of refrigerant-containing appliance subject to the leak repair requirements.

Further, given that HFCs are being phased down as compared to ODS, which are being phased out, HFCs and HFC substitute refrigerants with a GWP greater than 53 can be used indefinitely. Given that there is no date by which HFCs can longer be charged into appliances, it is paramount that EPA take steps to prevent leaks, reduce emissions, and maximize reclamation. Additionally, because the HFC phasedown will greatly limit the supply of virgin HFCs available to service appliances, the timely repair of leaks is required to limit the emissions of HFCs. The leak rate thresholds, in the final rule, facilitate the timely repair of leaking appliances, which will mitigate the amount of refrigerant lost and needed to service an appliance. Leak rate thresholds ensure owners and operators will take appropriate action to repair leaks so that their appliances are below the applicable leak rate threshold.

In regard to chillers used in the semiconductor industry, the commenter stated that small semiconductor chillers are typically removed from service if they begin leaking. EPA understands that these chillers are distinct, hermetically sealed devices that are removed when in need of servicing, and that such servicing is performed at a separate location, including at locations outside of the United States. If the chiller contains less than 15 pounds of refrigerant, as would be the case with many in this industry, the leak repair requirements do not apply. For chillers with 15 pounds of refrigerant or more, the Agency clarifies that appliances removed from service, that have their full charge evacuated and recovered, are not subject to the full suite of the leak repair requirements. An owner/operator may do this to conduct further repairs, to mothball the appliance for future repairs, or due to a retrofit or retirement plan (see section IV.C.3.f of this preamble). In the specific case of these semiconductor chillers, once the determination has been made that the appliance is leaking above the threshold rate and needs to be taken out of service, the owner/operator would need to evacuate and recover all refrigerant from the appliance in a way similar to how an owner/operator would mothball an appliance. Once repairs are made and the appliance is recharged for service, it is required to meet all of the requirements in the final rule's leak repair provision.

EPA also disagrees with one commenter's suggestion to forgo leak rate thresholds in favor of allowing calendar year leak rate calculations each time the owner or operator adds refrigerant because owners and operators should already be using some methodology for calculating their leak rate after adding refrigerant into an appliance. The Agency clarifies that leak inspections and the calculation of a leak rate does not equate to leak repair. Under the provisions finalized in this action, if an appliance is leaking above the applicable leak rate threshold, the owner or operator must repair any leaks to ensure the appliance's leak rate is brought below said threshold. Without a leak rate threshold there would not be a clear metric for determining when the leak repair requirements were triggered or when the appliance had been sufficiently repaired. The Agency also disagrees that appliance owners would repair leaks in a timely manner based on the incentive to save on refrigerant costs or to avoid operational disruptions alone. While EPA agrees that the leak repair provisions in this final rule are anticipated to have the effect of avoiding additional refrigerant costs and operational disruptions in many situations, financial motivations to conduct leak repair do not always align with the rule's purpose of minimizing the release of HFCs and their covered substitutes. For example, an owner/operator, in some cases, may find it more financially optimal to continually add refrigerant to an appliance instead of repairing it, or an owner/operator may not have adequate information about the costs associated with failure to repair leaks in making decisions about whether to voluntarily repair leaks. In EPA's view, the leak rate thresholds are an important part of the regulatory design of the leak repair requirements and help ensure that they serve the statutory purposes identified for regulations under subsection (h) to minimize the release of regulated substances from equipment and maximize reclamation.

The commenter also stated that the average annual leak rates for supermarkets is 25 percent and that the rule would require immediate repair of supermarket systems. The Agency responds that the purpose of the final rule is to minimize the release of regulated substances from appliances. If a supermarket system is leaking at a rate higher than 20 percent, the owner/operator would be required to repair leaks to the extent and within the timeframe specified in the final rule. Furthermore, the Agency disagrees with the commenter's assertion that the final rule would force supermarket owner/operators to repair and potentially retrofit or retire systems immediately, once the leak repair provisions go into effect, because the average supermarket has an annual leak rate of 25 percent. EPA reiterates that the leak repair provisions of this final rule are relatively consistent with the requirements for ODS refrigerants that have been and continue to be in use in supermarkets throughout the United States. EPA has also extended the compliance date for the leak repair provision by more than one year to further accommodate owner/operators' compliance with the provision. Moreover, the Agency notes that the 25 percent leak rate average that FMI cites for supermarkets is nearly double the less than 15 percent average leak rate GreenChill partners voluntarily report to EPA on an annual basis. Many GreenChill partners have been able to consistently achieve lower leak rates by adopting newer system technologies, using newer refrigerants, applying best practices, and maintaining leak-tight systems to decrease refrigerant emissions. The GreenChill voluntary partnership has also hosted webinars discussing these topics, which are available to the public. The purpose of this rule is to minimize the release of regulated substances from appliances. If any commercial refrigeration system is leaking above the applicable leak rate of 20 percent, an owner or operator is required to take the necessary steps to repair their appliance to the extent required within the timeframe specified in this final rule.

In response to one commenter's characterization of leak rates reported under the GreenChill voluntary partnership, the Agency clarifies that GreenChill does not have any requirements for specific leak rates in order to be a member. The leak rate thresholds cited by the commenter are award thresholds used by the Agency to recognize lower leak rates reported to EPA. The partnership represents over a third of U.S. supermarkets; however, the Agency does not know if supermarkets not in the GreenChill voluntary partnership are doing better or worse than the voluntary members. As previously stated, the Agency may reconsider the leak rate thresholds in a future notice-and-comment rulemaking but cannot justify changes to those thresholds solely on the basis of voluntary reporting under the GreenChill voluntary partnership.

c. Verification Testing

EPA is finalizing its requirements for initial and follow-up verification tests as proposed. The Agency is requiring initial and follow-up verification for refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53 as a part of the leak repair provisions under subsection (h). These requirements are analogous to similar provisions for affected ODS-containing appliances under CAA section 608 under 40 CFR 82.157(e). The final rule requires owners or operators to conduct initial and follow-up verification tests within specified timeframes for each leak that is repaired. The initial verification test is required to be performed within 30 days (or 120 days if an industrial process shutdown is required) of an appliance exceeding the applicable leak rate and must demonstrate that leaks are repaired, where a repair attempt was made. The initial verification test verifies that the leak has been repaired prior to adding refrigerant back into the appliance, and the follow-up

verification test confirms that the repair held after refrigerant has been added and the appliance has been brought back to normal operating characteristics. The follow-up verification test is required to be conducted within 10 days of a successful initial verification test or 10 days after the appliance has returned to normal operating conditions (if the appliance or isolated component of the appliance was evacuated to perform repairs). The follow-up verification test is necessary to confirm that the leak repair has held after the refrigerant-containing appliance has been recharged, pressurized, and returned to normal operating conditions. If the initial or follow-up verification tests indicates that a leak repair was not successful, the owner or operator may conduct as many additional repairs and initial or follow-up verification tests as needed to achieve a successful leak repair within the applicable time period.

EPA notes that in some cases, a follow-up verification test may be impossible; for example, when it would be unsafe to be present when the system is at normal operating characteristics and conditions. Where it is unsafe to be present or otherwise impossible to conduct a follow-up verification test when the system is at normal operating characteristics and conditions, the Agency is requiring that where practicable, the follow-up verification test be conducted prior to the system returning to normal operating characteristics and conditions. In such situations, the owner or operator has the burden of showing that it was unsafe to be present when the system is at normal operating characteristics and conditions.

As discussed in the proposal, verification testing involves important practices, processes, and activities regarding the repair and servicing of equipment. The tests are performed shortly after an appliance has been repaired to confirm that the leak has been successfully repaired. Without the verification tests, it may take additional time for the owner or operator to realize that the repair has been unsuccessful and during that time refrigerant could continue to leak from the appliance. The provision is designed to help ensure that leaks are repaired successfully and that the repair holds, so that repair has the intended effect of limiting refrigerant emissions from the appliance. EPA is finalizing requirements that the verification tests must be performed for all leak repairs to ensure that the leak repair is done correctly the first time, holds, and has its intended effect, which will help minimize releases of HFCs from the appliance, and also help maximize HFCs available for eventual reclamation by limiting such releases.

Comment: A commenter stated that a properly commissioned system should not require an additional verification step in later weeks or follow-up leak requirements. They asserted that properly commissioned maintenance work, as required by UL 60335–2–40 and UL 60335–2–89, or another appropriate standard should be sufficient. The commenter recommended EPA restrict this requirement to systems with very large charge sizes, perhaps above 500 pounds, to be consistent with other thresholds set in the rule. The commenter also suggested EPA should require reporting if a leak is repaired in a system that has to be recharged again within six months.

Response: EPA is finalizing the verification test provision as proposed. The Agency disagrees that properly commissioned maintenance work does not need to go through the leak repair verification process. The standards required by UL 60335–2–40 and UL 60335–2–89 are industry standards, developed by consensus and concerned with appliance design and manufacture. The standards do not speak to the operations of an appliance over multiple years. Instead, UL standardizes leak prevention requirements in the appliance's design, standardizes leak detection through sensors or other mechanisms, and provides standards to mitigate the release of refrigerants via releasable charge considerations.[75] Moreover, the leak repair requirements and thus the need for verification tests begin when an appliance exceeds its applicable leak rate. If an appliance is well designed and follows practices consistent with the requirements of the standard, perhaps there will not be an occurrence of leaks that result in an exceedance of the applicable leak rate and thus the owner/operator would not need to proceed with the final rule's leak repair process.

The Agency also disagrees that the verification requirement be restricted to appliances with very large charge sizes because the purpose of the provision is to ensure that leaks are properly repaired and that those repairs hold, such that the repair has its intended effect and emissions are minimized. We also disagree with the suggestion that EPA require reporting if an appliance is recharged within six months of a leak repair, as this is not a reasonable substitute for verification tests or leak inspections of repaired appliances. EPA clarifies that a leak is considered repaired if refrigerant is not added within 12 months of the previous leak repair or if there are no leaks identified by either the required periodic leak inspection(s) or an ALD system, where applicable. Verification tests ensure repairs hold and leak inspections verify that the repaired leak has not failed over a 12-month period; both are warranted portions of the leak repair process and support meeting the purposes identified in subsection (h)(1), including minimizing the release of regulated substances from equipment.

[75] ASHRAE Standard 15–2022 defines releasable charge as a portion of the system refrigerant charge that can be released into a space as a result of a single point failure.

d. Leak Inspections

The Agency is finalizing leak inspection requirements as proposed for refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant that contains an HFC or substitute for an HFC with a GWP greater than 53 that are found to be leaking above the applicable leak rate threshold. As discussed in the proposal, the leak inspection requirements involve processes, practices, and activities regarding the repair of refrigerant-containing appliances that are designed to ensure the long-term effectiveness of a successful leak repair. Thus, the requirements will help minimize any releases of HFCs from equipment over time and also help maximize HFCs available for eventual reclamation by limiting such releases. The owner or operator is responsible for ensuring that the leak inspections are conducted consistent with the applicable requirements in 84.106.

Leak inspection frequency is dependent on the type of appliance and the size of the appliance (by refrigerant charge size). For commercial refrigeration and IPR appliances that have a charge size of 500 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53, EPA is requiring leak inspections to be performed every three months after the date of repair as demonstrated by a successful follow-up verification test until the owner or operator can demonstrate that the appliance has not exceeded the applicable leak rate for four consecutive quarters. For commercial refrigeration and IPR appliances that have a charge size between 15 and 500 pounds of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53, EPA is requiring that leak inspections be performed once per year after the date of repair demonstrated by a successful follow-up verification test until the owner or

operator can demonstrate that the refrigerant-containing appliance has not exceeded the applicable leak rate for one year (*i.e.,* 12 months). For comfort cooling and other appliances that have a charge size of 15 pounds or above of a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53, EPA is requiring that leak inspections be performed once per year after the date of repair demonstrated by a successful follow-up verification test until the owner or operator can demonstrate that the equipment has not exceeded the applicable leak rate for one year (*i.e.,* 12 months). In each case, to demonstrate an appliance has not exceeded the applicable leak rate, the leak rate is calculated during a leak inspection as described in section IV.C.3.a of this preamble. EPA is establishing that it is appropriate to require more frequent leak inspections for larger commercial refrigeration and IPR appliances (*i.e.,* charge sizes at or above 500 pounds), as the larger charge size means that potential emissions from the appliance are greater if a leak is not properly repaired.

EPA is also finalizing the use of ALD systems as a compliance option in lieu of quarterly or annual leak inspections. Owners or operators voluntarily using an ALD system to monitor leaks in a refrigerant-containing appliance that are not subject to the ALD requirements in the final rule (see section IV.D.1 of this preamble) are not required to conduct periodic leak inspections unless an applicable leak rate threshold has been exceeded. Once the applicable threshold has been exceeded the owner or operator is required to perform leak inspections on any portions of the appliance where the ALD system is not monitoring for leaks. Owners or operators choosing to install an ALD system, in lieu of the required leak inspections, must meet the requirements for ALD systems (including annual ALD system audit and calibration requirements). The Agency is also finalizing separate requirements for the use of ALD systems for commercial refrigeration and IPR appliances that have a charge size of 1,500 pounds or more of refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53. That is, the leak inspections that are being codified at 40 CFR 84.106(g) and the requirements related to ALD systems that are being codified at 40 CFR 84.108 are separate provisions that apply in different circumstances. For further information and requirements related to ALD systems in this action, refer to section IV.D.1 of this preamble.

Comment: EPA received mostly supportive comments on the proposed rule's leak inspection provisions. One commenter supported the option to use ALD in lieu of quarterly or annual leak inspections Another commenter supported the provision to require periodic manual leak inspections for portions of the appliance that are not being monitored by an ALD system. The commenter suggested that EPA require quarterly inspections for portions of an appliance with a charge size of 1,500 pounds or more that are not covered by an ALD system regardless of whether the appliance is leaking above its applicable leak rate. Another commenter in support of the varying leak inspection requirements in the final rule encouraged EPA to adopt routine leak inspections regardless of whether the refrigerant-containing appliances are found to be leaking or not. The commenter stated that routine leak inspections are a good way to catch leaks early and prevent high-volume leakage. One commenter requested clarification on whether EPA intended for leak inspections to be performed "once per year" or "within 365 days of the repair." The commenter suggested the "within 365 days of the repair" interpretation would align with 40 CFR part 82, subpart F.

Response: EPA is finalizing the leak inspection requirements as proposed. We acknowledge the comments in support of the provision. EPA acknowledges one commenter's support for the use of ALD as a compliance option. This decision was based on considerations of previous utilization of ALD systems under CAA section 608 where the Agency provided additional flexibility to facility owners to opt into ALD. The Agency agrees that routine leak inspections are helpful in preventing high-volume leakage from appliances and generally recommends periodic leak inspections as a best practice, even for well-maintained appliances. EPA did not propose and is not finalizing the repair of all leaks or more frequent leak inspections; however, the Agency encourages owners or operators to adopt strategies to ensure their refrigerated-containing appliances are operating with minimal leaks. EPA clarifies that leak inspections are not tied to the discovery of a leak, but rather to the determination that an appliance is leaking above the applicable threshold and occur on a set timeline based on charge size (except for appliances where all portions of the appliance are monitored by ALD). EPA also clarifies that quarterly or annual leak inspections are required for portions of an appliance that are not being monitored by an ALD system when an appliance has exceeded its leak rate threshold. The Agency reiterates that the final rule is requiring the repair of leaks so that the appliance is under the applicable leak rate threshold, not the repair of all leaks. The addition of periodic inspections not related to the final rule's leak repair timeline would add additional burden to owner/operators and dampen the flexibilities in the leak repair provision. The Agency may reevaluate the frequency of leak inspections in a future notice-and-comment rulemaking but is not finalizing additional periodic leak inspections in this rulemaking.

The Agency disagrees with one commenter's suggestion to require periodic inspections of portions of an appliance not covered by an ALD system. EPA views the continuous monitoring of an appliance as serving the function of monitoring for leaks. Thus, a requirement for performing periodic leak inspections on those portions of the appliance is unneeded. The final rule does require leak inspections for portions of the appliance not monitored by ALD when the appliance is leaking above the applicable leak rate; however, this requirement is needed to ensure the repairs of leaks have not failed. Leak inspections serve as a method of determining whether repairs of refrigerant-containing appliances are adequate and if further action is needed.

The Agency clarifies that quarterly and annual leak inspections are to be conducted within 365 days from the date of repair, demonstrated by a successful follow-up verification test. For example, an owner or operator of a 500-pound IPR appliance that was found to be leaking above the applicable threshold would need to repair the leaks in the appliance (and conduct verification tests) so that the appliance is below the applicable threshold. The owner or operator, starting from the completion of repair, as demonstrated by a of a successful follow-up verification test, must then conduct quarterly leak inspections for a year and demonstrate that any leaks from the appliance are under the applicable threshold. Leak inspections would then cease until the next leak event above the applicable threshold occurs. The Agency also clarifies that the use of the term "calendar year" in the proposal's preamble was intended to mean "365 days" in the context of the timing of leak inspections.

Comment: One commenter objected to EPA implementing more frequent inspections than currently existing

requirements under 40 CFR part 82, subpart F. Specifically, the commenter stated EPA should not require more frequent inspections than annually for systems between 15 and 500 pounds, and asserted that owners and operators would experience significant burden from more frequent inspections given the increase in appliances covered by the 15-pound threshold, the process for sniffing, and the additional work required if a leak is found. While the comment was less clear on this point, it also stated the view that it is not necessary to increase the frequency of leak inspections to be more than annual for equipment with a charge of 500 pounds or more.

Response: The Agency clarifies that the final rule's leak inspection requirements mirror the frequency of similar requirements under 40 CFR part 82.157(g). The Agency disagrees with the commenter's recommendation to only require annual leak inspections for all charge sizes. EPA is requiring quarterly inspections of appliances with charge sizes above 500 pounds given the risk of additional leaking (*e.g.,* that the leak could recur) once an appliance has exceeded the leak rate threshold and given that such large systems could release more refrigerant than smaller systems if additional leaking occurs. With these considerations, it is critical to ensure larger appliances are more frequently monitored for leaks. Quarterly leak inspections for large refrigerant-containing appliances ensure that the leak repair requirements operate as intended to minimize releases of HFCs from equipment, consistent with the purposes identified in subsection (h).

e. Chronically Leaking Appliances

As part of the leak repair provisions under subsection (h), EPA is finalizing specific requirements for refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53 that meet the criteria for a chronically leaking appliance. The requirements are designed to gather information and support efforts to address such chronic leaks, which have the effect of further minimizing emissions from equipment. A refrigerant-containing appliance is considered a chronically leaking appliance if it leaks 125 percent or more of its full charge within a calendar year. The requirements for chronically leaking appliances are similar, but not identical to, analogous requirements under 40 CFR 82.157(j). In the final rule, EPA is requiring reporting for covered refrigerant-containing appliances that meet the criteria to be considered chronically leaking. Submitted reports must describe the efforts taken to identify leaks and repair the appliance.

To better serve the purposes of minimizing releases of regulated substances and allow EPA to verify the information being reported more easily, EPA is standardizing the reporting format for chronically leaking appliances. EPA is requiring that the reports must be submitted no later than March 1 of the following calendar year of the ≥125 percent leak. EPA is requiring that these reports cover basic identification information (*i.e.,* owner name, facility name, facility address where appliance is located, and appliance ID or description), appliance type (comfort cooling, IPR, or commercial refrigeration), refrigerant type, full charge of appliance (pounds), annual percent refrigerant loss, dates of refrigerant addition, amounts of refrigerant added, date of last successful follow-up verification test, explanation of cause of refrigerant losses, repair actions taken, a signature from an authorized company official, and whether a retrofit or retirement plan has been developed for the appliance, and, if so, the anticipated date of retrofit or retirement. EPA proposed and is finalizing that these reports be submitted electronically using the Agency's applicable reporting platform. The information in these reports would either be contained in the records EPA is establishing that owner or operators are required to maintain or is the type of information that is on hand during the ordinary course of business. Because of the amount of refrigerant emitted, chronically leaking appliances warrant special attention. These reporting requirements for chronically leaking equipment are designed to help ensure that owners or operators are complying with the leak repair provisions and that they have taken appropriate steps to identify the leaks and correct the root cause of those leaks. These reports will allow EPA to evaluate compliance with the regulatory requirements and to identify entities that may benefit from compliance assistance and other outreach efforts. These reports will also allow EPA to assess common root causes for appliances that chronically leak, which would facilitate consideration of approaches to mitigate these leaks and minimize the releases of HFCs from such equipment. EPA discusses whether this information is entitled to confidential treatment in section V.A.1 of this preamble.

Comment: Some commenters suggested that EPA should require reporting when system leak rates exceed 110 percent per year rather than the proposed 125 percent value. One commenter indicated that this lower threshold would support close monitoring of systems that experience a loss of full charge so that unrepaired faults are repaired. One commenter suggested that EPA should set a quicker timeline for required leak repairs for chronically leaking appliances.

Response: The Agency is finalizing the chronically leaking appliances provision as proposed. EPA acknowledges the comments suggesting that it should lower the chronic leak rate but finds the 125 percent threshold more appropriate, as the Agency intends to focus on gathering information from chronically leaking appliances and to avoid capture of refrigerant-containing appliances affected by unavoidable losses that do not reflect a chronic issue. The 125 percent threshold allows the Agency to focus on chronic leakers, as systems would have to lose their full charge and then a significant quantity more to trigger the requirements. The Agency also notes that the 125 percent threshold aligns with the chronic leak rate established in the CAA section 608 regulations which may allow the Agency to compare or combine information obtained under this program with that obtained under CAA section 608 and develop a better understanding of the issues that lead to chronic leaking across a broader group of appliances. In response to the commenter's view that a chronic leak rate of 110 percent would support closer monitoring of appliances, especially appliances with large charge sizes, the Agency notes that a chronic leak rate of 110 percent may still capture appliances affected by unavoidable losses and thus dilute focus on the target group of appliances. One commenter requested that chronically leaking appliances be required to repair leaks on a quicker timeline. EPA responds that the timeline for repair of a chronically leaking appliance is the same as for any other appliance that triggers the leak repair requirements. The Agency further notes that some chronically leaking appliances would be subject to the retrofit or retirement provisions in the final rule, for example, if they continue to leak above the applicable leak rate after having conducted the required repairs and verification tests.

Comment: Another commenter suggested an alternative to EPA's proposal to require reporting when system leak rates exceed 125 percent in one year. The commenter suggested the annual leak rate percentage to require reporting should be 100 percent plus the allowed annual leak rate percentage for

an equipment category plus five percent. Alternatively, the commenter suggested that EPA could choose a lower percentage and allow an exception for a single catastrophic leak.

Response: EPA disagrees with the commenter's suggested approach. The commenter's suggestion would allow certain appliances (*i.e.,* IPR) to leak 135 percent in one year before becoming subject to the chronic leaker provision. Thus, for some appliances, the commenter's suggested approach would prevent EPA from obtaining information about certain appliances that may chronically leak but not at such a high rate, and thus might limit the Agency's understanding of the issues that may lead to chronic leaking at the 125 percent threshold. This approach would also differ from the approach under the CAA section 608 regulations, which may limit the Agency's ability to compare or combine the information obtained under this program with that obtained under CAA section 608. For the same reason, EPA is not adopting a lower percentage together with an exception for a single catastrophic leak event because EPA is not persuaded that this approach would allow us to obtain information focused on the appliances of most interest under this requirement.

Comment: One commenter stated that if EPA lowers the leak repair threshold to appliances with a charge size of 15 pounds, there will be a large number of reportable, chronically leaking appliances with full charge sizes between 15 and 49 pounds. The commenter stated that appliances with small charge sizes tend to lose their entire charge size before anyone realizes there is a leak, and therefore any appliance with more than one leak in a calendar year will be reportable to EPA. The commenter further claimed that the amount of refrigerant added to these small appliances does not necessarily reflect the amount of refrigerant leaked out of them, and that technicians tend to put whole cylinders worth of refrigerant into appliances whether the appliance requires it or not, because technicians do not like carrying partially empty cylinders on their trucks. The commenter asserted that this would lead to a larger number of chronically leaking appliances, not because these appliances are in fact leaking chronically, but rather because of the nature and size of the appliances that would be regulated under the proposed rule.

Response: EPA views the chronic leak reports as necessary to supporting the Agency's efforts to reduce emissions of refrigerants from appliances. EPA does not view an increase in chronic leak reporting for appliances below 50 pounds negatively because the Agency wants to ascertain issues with refrigerant-containing appliances and better understand why such appliances at all charge sizes are chronically leaking. For example, as the commenter stated some appliances with small charge sizes lose their full charge very quickly, and the Agency wants to know why these appliances are leaking at such a high rate and what owners or operators are doing to repair the leaks to ensure that the appliances are no longer chronically leaking. The Agency disagrees that these appliances would not be considered chronically leaking because of their size or the way they are serviced. EPA also notes that the commenter's description of servicing a small appliance is concerning because the overcharging of an appliance may lead to additional issues with leaks. It is unclear from the commenter's description why a technician would potentially overcharge a system simply to avoid having to carry partial cylinders. Regardless of the commenter's example, any appliance leaking more than 125 percent of its full charge in one year is subject to the final rule's chronic leak reporting.

f. Retrofit and Retirement Plans

EPA is finalizing aspects of the proposed retrofit and retirement plan provision, with modifications after consideration of the comments and information received on the proposed rule. EPA is requiring the development of retrofit and retirement plans for refrigerant-containing appliances that contain HFCs and certain substitutes for HFCs, where leaks cannot be repaired, or when an owner or operator chooses to retrofit or retire an appliance rather than repair a leak. As further discussed in section IV.A.2 of this preamble, EPA is not finalizing the aspect of the proposed definition of retrofit that would require that a retrofit be to a lower-GWP alternative than the original refrigerant; thus, the final rule allows the retrofit of refrigerant-containing appliances to a refrigerant that does not have a lower-GWP than the original refrigerant. This determination is based on consideration of the potential compliance burden of requiring retrofits to lower-GWP refrigerants for certain appliances subject to the leak repair provision. However, the Agency encourages owner/operators to choose lower-GWP options when considering retrofits.

The final rule provides the details on the timing for creating a retrofit or retirement plan for covered refrigerant-containing appliances, and what must be contained in a retrofit or retirement plan. EPA is requiring that a retrofit or retirement plan be created within 30 days of certain scenarios. The Agency understands this timing is sufficient for an owner or operator to either attempt to repair the leak with all the necessary requirements as described in section IV.C.3.b of this preamble or make a business decision to directly begin the retrofit or retirement process. It is necessary to cap this timing requirement to minimize emissions from leaks in the case where an owner or operator fails to take any action after finding that their applicable refrigerant-containing appliance is leaking above the applicable leak threshold. After 30 days, the owner or operator must begin developing a retrofit or retirement plan. The following scenarios describe when a retrofit or retirement plan must be developed:

- A refrigerant-containing appliance is leaking above the applicable leak rate, and the owner or operator intends to retrofit or retire the appliance rather than repair the leak;
- A refrigerant-containing appliance is leaking above the applicable leak rate, and the owner or operator fails to take action to identify or repair the leak; or
- A refrigerant-containing appliance is continuing to leak above the applicable leak rate after an attempted leak repair and verification testing.

EPA is requiring that the retrofit or retirement plan include information regarding the location of the appliance, characteristics of the appliance, a procedure for how the appliance will be converted to accommodate a different refrigerant (if the appliance is being retrofitted), plans for the disposition of any recovered refrigerant and the appliance (if the appliance is being retired), and a schedule for the completion of the appliance retrofit or retirement. Characteristics of the appliance that will be retrofitted or retired include the type and full charge of the refrigerant used in the appliance, and for retrofitting, the type and full charge of the refrigerant to which the appliance will be retrofitted. In describing how the appliance will be retrofitted, the owner or operator must include an itemized procedure for converting the appliance to a different refrigerant, including changes required for compatibility. This also includes any changes for compatibility that relate to safety considerations to ensure the safety of technicians and consumers when converting an appliance to a different refrigerant, which further serves one of the purposes identified in subsection (h)(1). EPA is also requiring that the retrofit or retirement plan must

include information on how any recovered refrigerant is being dispositioned. In the case of retiring an appliance, the retirement plan needs to include how the appliance is being disposed of. EPA is establishing that the retrofit or retirement plan must include a schedule for completion of the retrofit or retirement and, unless additional time is granted, that the schedule may not exceed one year of the plan's date (not to exceed 12 months from when the plan was finalized). Owners or operators may request relief from the provisions of a retrofit or retirement plan if they are able to prove that an appliance is no longer leaking above the applicable leak rate within 180 days of creating the plan and they agree to repair all identified leaks within one year of the plan's date. The owner or operator is required to submit specified information to EPA, including information regarding leaks in the appliance, descriptions of the work completed/to be completed, and more, per 40 CFR 84.106(h)(5)(ii).

For IPR equipment, extension requests are allowed in cases where requirements or other applicable Federal, State, local, or tribal regulations make it impossible to complete the retrofit or retirement within one year. In this case, owners or operators could be permitted additional time to the extent needed to comply with the applicable regulations. EPA is also establishing a provision that allows for extensions to be requested for IPR equipment if the equipment is custom-built and the supplier of the appliance or one of its components has quoted a delivery time of more than 30 weeks. In such cases, the appliance or component must be installed within 120 days of receipt. If additional time is needed, the owner or operator would need to submit a request for the additional time to EPA. Further, extensions can be requested to complete a retrofit or retirement if the IPR equipment is located in an area subject to radiological contamination or if shutting down the appliance will directly lead to radiological contamination. In this case, EPA is allowing additional time to the extent necessary to complete the retrofit in a safe working environment. EPA did not propose and is not finalizing extensions specifically applicable to federally owned equipment (see, *e.g.,* the provisions at 40 CFR 82.157(i)(3)). EPA discussed in the proposal that these circumstances can be addressed under the other extension provisions.

As noted in the proposal, these requirements reduce emissions by capping the amount of time an appliance can remain in operation when it is known to be leaking above the leak rate threshold. Developing the retrofit or retirement plan is a key process in ensuring that each step of the plan is successfully performed such that releases of HFCs are minimized and the reclaiming of the HFCs can be maximized. Owners or operators may choose to retrofit or retire a leaking appliance rather than repair a leak, or, in some situations, may be required to retrofit or retire the appliance if successful leak repair cannot be achieved and verified. The requirements also further serve the purposes of minimizing releases and maximizing the reclaiming of HFCs, as proper retrofit or retirement of a leaking appliance helps ensure that further HFC emissions from such equipment are mitigated. Additionally, in the process of retrofitting or retiring an appliance, the refrigerant that was remaining in the leaking appliance must be recovered and could then subsequently be reclaimed.

Comment: Several commenters provided recommendations for EPA's proposal regarding retrofit and retirement plans. Two commenters requested that retrofit and retirement plans include a provision to retrofit an appliance with a lower-GWP refrigerant. Another commenter suggested EPA allow for a repair plan for IPR appliances to ensure continued operation of industrial manufacturing processes that rely on IPR systems to continue to operate while the owner or operator pursues repair of the appliance. Specifically, the commenter stated that it is unfeasible to retrofit IPR appliances with evaporator temperatures below −50 °C (−58 °F) because low-temperature appliances are typically not retrofitted and have limited lower-GWP options, as demonstrated by the 2023 Technology Transitions Rule exclusion of these systems. The commenter stated that the design and replacement of these systems may take several years, and a repair plan should allow the facility to continue operations while taking the necessary steps to address the leaks.

Response: EPA is finalizing aspects of the proposed retrofit and retirement plan provision, with modifications after consideration of the comments and information received on the proposed rule. In the final rule, the Agency is not requiring that retrofit plans must transition to lower-GWP refrigerants (see section IV.A.2 of this preamble). The decision of what type of retrofit is appropriate when a refrigerant-containing appliance cannot be repaired is the decision of the owner/operator; however, EPA encourages owners or operators to retrofit appliances to lower-GWP refrigerants. It is also up to the discretion of the owner or operator to decide if an appliance can be retrofitted or retired and replaced when an owner or operator cannot repair a leak below the applicable threshold within the final rule's provided leak repair timeframe. While some commenters suggest the Agency should require retrofitted appliances to use lower-GWP refrigerants, EPA has determined that requiring the use of lower-GWP refrigerants may pose a compliance issue with the provision. For certain appliances with limited lower-GWP alternatives, the proposal's definition of retrofit would have limited said appliances from having the option to retrofit. As previously discussed in this section, the retrofit and retirement provision reduces emissions of HFCs and covered substitutes by capping the amount of time an appliance can remain in operation when it is known to be leaking above the applicable leak rate threshold. Limiting certain appliance owners to one method of compliance (*i.e.,* retirement) would not further the purpose of this rule to reduce emissions from equipment and may increase non-compliance with the provision in certain instances (*e.g.,* an owner or operator is unable to retrofit an appliance with a lower-GWP refrigerant). EPA notes that not all appliances are fit to be retrofitted; however, the proposal's definition of retrofit may have been too restrictive in how appliances could be retrofitted to comply with the leak repair provisions in the final rule.

EPA disagrees with one commenter's request to allow for a repair plan for appliances incapable of repairing leaks in the final rule's specified timeframe. The continuous operation of an appliance that is leaking above its applicable leak rate threshold is directly opposed to reducing emissions and further serving the purposes outlined in subsection (h)(1). The commenter's suggested repair plan would not adequately address leaks in a timely manner in order to minimize the release of refrigerants. and continued operation of the appliance would necessitate the addition of more refrigerant that would also be at risk of being emitted. The final rule provides 12 months from the approval of a retrofit or retirement plan to retrofit or replace a system. There is also the ability to extend the implementation of an owner or operator's retrofit or retirement plan by one year if certain conditions are met. The Agency finds this timing to be sufficient and notes that the commenter did not provide sufficient evidence to prove that these specific IPR systems

take an exceptionally long time to replace. In regard to the commenter's concerns on retrofitting not typically being an option for certain low-temperature IPR systems due to limited lower-GWP options, EPA reiterates that changes to the definition of retrofit should permit the retrofit of these appliances. This change should provide owners and operators with the option to retrofit or retire an appliance, even under the circumstances described by the commenter.

Comment: One commenter stated that 30 days is inadequate to develop a retrofit and retirement plan for complex appliances like supermarket systems. The commenter claimed that multiple repair attempts may be necessary to effectuate a repair and stated that owners or operators would not have the opportunity to conduct multiple repair attempts and would therefore be pushed into developing a retrofit and retirement plan. Further, the commenter asserted that there is uncertainty on the timeframe to complete retrofit or retirement plans because the approval of extension requests is at EPA's discretion. For these reasons, the commenter suggested EPA extend the time to create a retrofit and retirement plan to 90 days to allow for sufficient development of the plan. Additionally, the commenter suggested EPA could adopt retrofit or retirement planning if an appliance has two or more leaks during which a certain percentage of the full charge is lost in a calendar year. The commenter also proposed an alternative relief provision if the owner or operator has a zero percent leak rate for the first 180 days of the following calendar year.

The commenter also asserted that the rule exceeds EPA's authority under the AIM Act because it would undermine key flexibilities intended by Congress in phasing down HFCs. The commenter asserted that the AIM Act does not confer limitless authority to EPA to impose the expansive and unnecessarily burdensome leak detection and repair requirements set forth in the proposed rule. The commenter also claimed that subsection (h) does not authorize the Agency to compel retrofit of existing refrigeration appliances with lower-GWP refrigerants or to require system retrofit or retirement in situations where leaks cannot be addressed under the narrow leak repair timeline in the final rule. The commenter further stated that finalizing these requirements would contravene the congressional intent that EPA establish a market-based mechanism to phase down HFCs in an economically efficient way and that existing systems be exempt from technology-forcing regulations, which are only authorized under subsection (i).

Response: The Agency disagrees that 30 days is not enough time to prepare a retrofit or retirement plan. Owners or operators will typically know during the leak repair process whether they will retrofit or retire an appliance. Some owners or operators might also prefer to opt into a retrofit or retirement plan in lieu of attempting a leak repair or if the appliance is continuing to leak above the applicable leak rate after an attempted leak repair(s) and verification testing. The Agency clarifies that the leak repair provision does not bar owners or operators from conducting multiple repair attempts and verification tests within the leak repair timeline described in section IV.C.3.b of this preamble, contrary to the commenter's claim. If the owner or operation intends to repair the leaks and a repair is attempted, the retrofit or retirement requirement in this final rule does not begin until the required repairs and verification tests have been completed but the appliance has not been brought below the applicable leak rate threshold in the allotted leak repair timeframe (see 40 CFR 84.106(h)(1)(iii)). If the initial verification test indicates that the repairs have not been successful, the owner or operator may conduct as many additional repairs and initial verification tests as needed within the applicable time period (see 40 CFR 84.106(e)(1)(iii)) and may also request an extension if the applicable requirements under 40 CFR 84.106(f) are met; such requests are considered approved unless EPA notifies the owners or operators otherwise. Additionally, the required information (40 CFR 84.106(h)(2)) for retrofit or retirement plans should be readily available to the owner or operator. EPA clarifies that retrofit or retirement plans are not required to be submitted to the Agency; the plans must be retained as record on the site of the refrigerant-containing appliance that can be made readily available for inspection by EPA. Therefore, there is no uncertainty with whether the Agency would accept a retrofit or retirement plan, because it is not required to be reported to the Agency unless the owner or operator is requesting relief from a retrofit or retirement plan or the owner or operator is requesting an extension in time to complete the retrofit or retirement of an appliance. Further, the Agency is providing clarity in the final rule that a retrofit or retirement plan is necessary when:

- A refrigerant-containing appliance is leaking above the applicable leak rate, and the owner or operator intends to retrofit or retire the appliance rather than repair the leak;
- A refrigerant-containing appliance is leaking above the applicable leak rate, and the owner or operator fails to take action to identify or repair the leak; or
- A refrigerant-containing appliance is continuing to leak above the applicable leak rate, even after attempted leak repair(s) and verification testing.

EPA also disagrees with the commenter's suggested alternative approaches to a retrofit or retirement plan because they would inadequately address emissions from appliances that are leaking above the applicable leak rate threshold compared to the requirements EPA proposed and is finalizing in this rulemaking. Providing 90 days as the default period to develop a retrofit or retirement plan would delay planning for and implementation of certain measures to address such appliances, including in situations where the owner or operator could comply with the 30-day timeframe for the plan. Similarly, waiting for an end-of-year calculation to determine whether an appliance requires retrofit or retirement would lead to an indeterminant amount of refrigerant being emitted during the year. Thus, the commenter's proposals would not promptly address emissions from refrigerant-containing appliances and would further delay the process for retrofitting or retiring a refrigerant-containing appliance that continues to leak above the applicable leak rate threshold, including in situations where the leaks cannot be repaired; those appliances would be expected to continue to leak above the applicable threshold during that delay, thus leading to additional emissions from these appliances. For these reasons, the commenter's proposals would not be a well-suited approach compared to the provisions for retrofit and retirement plans that EPA proposed and is finalizing to minimize releases from equipment and maximize reclamation. Additionally, the commenter's alternative to the relief provision is not reasonable, as having a zero percent leak rate in the first 180 days of the following calendar year could cause the relief provision to fall well outside the timeframe for retrofit and retirement plans. The Agency clarifies that retrofit and retirement plans are to be *completed* within 12 months of submitting the retrofit and retirement plan, unless an extension as outlined in 40 CFR 84.106(i) applies. The provision is not based on the calendar year; rather, the timeframe is based on the owner or operator not repairing leaks below the

applicable threshold within the allotted time for leak repair and thus needing to develop a retrofit or retirement plan. Specifically, the timeframe for completion of a retrofit or retirement plan begins when an owner or operator submits their retrofit or retirement plan to the Agency. Owners or operators can apply for relief from their retrofit or retirement plan within 180 days of the plan's date if, among other things, they can establish the appliance is repaired and no longer leaking above the applicable leak rate. EPA also clarifies that the Agency is not requiring appliances to have a zero percent leak rate, because this may be unreasonable for certain appliances at certain charge sizes. Owners or operators must simply ensure that an appliance is leaking below an appliance's applicable leak rate threshold and meet the other requirements listed in 40 CFR 84.106(h)(5)(ii) to apply for relief from their retrofit or retirement plans.

With respect to the comments on EPA's legal authority, EPA notes that it is not further addressing the comments on whether it has legal authority to require that retrofits use a lower-GWP refrigerant because it is not finalizing such a requirement in this action. EPA disagrees with the comments that subsection (h) does not authorize the Agency to require system retrofit or retirement in situations where leaks cannot be addressed under the narrow leak repair timeline, and with those that claim the requirement contravenes congressional intent. EPA interprets its regulatory authority under subsection (h)(1) to include authority to establish requirements related to the prevention and repair of leaks for equipment containing HFCs or substitutes for HFCs, as such requirements control practices, processes, and activities regarding the servicing, repair, disposal, or installation of equipment. These requirements also implement the purposes identified in subsection (h) of minimizing releases of HFCs from equipment and maximizing reclamation. The leak detection and repair requirements finalized in this rule, including the retrofit or retirement requirements, fit squarely within this grant of authority. The retrofit or retirement requirements apply when the leak has not been repaired consistent with the regulatory requirements and are designed to ensure that additional action is taken to address such leaks and limit the ongoing release of the refrigerant to the environment, thus serving the purposes identified in subsection (h) of maximizing reclamation and minimizing release of HFCs from equipment. The types of activities taken as part of retrofit or retirement—such as modifications to the appliance needed to convert it to a new refrigerant, switching the refrigerant from the old to the new refrigerant, and repairing all identified leaks for a retrofit, or actions to retire and dispose of the appliance in the case of a retirement—are typical examples of the kinds activities related to the servicing, repair, installation, or disposal of equipment that Congress authorized EPA to control through regulations under subsection (h).

EPA also disagrees with the commenter's characterization of Congressional intent, as that characterization ignores the role of subsection (h) in the overall statutory scheme. The AIM Act contains a variety of provisions that are targeted at addressing different aspects of regulated substances. This rule does not address the Act's phasedown provisions, nor does it address the technology transition provisions; thus, comments directed at those provisions are beyond the scope of this rulemaking and require no further response. However, to the extent that the comment suggests that these aspects of the AIM Act preclude EPA from issuing regulations that subsection (h) directs it to issue, EPA disagrees. Rather, EPA views the Act as providing separate and distinct regulatory authorities, which can be implemented in ways that reinforce and complement one another. EPA also disagrees with the commenter's implication that technology-forcing regulations are only authorized under subsection (i) of the Act. The plain text of the Act includes no such limitation. Interpreting the Act to include one would limit EPA's ability to fulfill the direction and achieve the purposes stated in subsection (h). While EPA acknowledges that subsection (i)(7)(B), entitled ''Applicability of Rules,'' includes the limitation that a ''rule promulgated under this subsection shall not apply . . . except for a retrofit application, equipment in existence in a sector or subsector before December 27, 2020,'' that restriction expressly applies only to rules issued under subsection (i); it does not apply to rules promulgated under subsection (h), such as this rule. In fact, subsection (h) includes its own provision addressing inapplicability for regulations under (h) at (subsection (h)(4) entitled ''Inapplicability''). That provision does not mention any limitation on application of the rules to existing equipment. If Congress had intended for such a limitation to apply under subsection (h), it is reasonable to expect that legislators would have explicitly included it in this provision, as they did in subsection (i)(7)(B).

Regarding the commenter's assertion that the AIM Act does not confer limitless authority to EPA to impose the proposed ''expansive'' and ''unnecessarily burdensome'' leak detection and repair requirements, the Agency does not view the AIM Act as conferring limitless authority. Instead, EPA concludes that in this rule the requirements that are being finalized are well within the scope of authority provided by the AIM Act and are consistent with subsection (h), for the reasons described previously in this response and elsewhere in this final rule. EPA disagrees with the characterization of this rule as ''unnecessarily burdensome'' for the reasons described in section IV.C.2 of this preamble. Further, the Agency has explained why these requirements are appropriate for serving the purposes under subsection (h) as described throughout this section of the preamble.

Comment: One commenter recommended that EPA align the requirements for retrofit or retirement plans with the CAA section 608 regulations to reduce uncertainty and compliance costs. The commenter also suggested that EPA consider merging the entire leak detection and repair programs under CAA section 608 and subsection (h) of the AIM Act into one regulation to help streamline the respective requirements and avoid confusion in compliance on the part of owners and operators.

Response: EPA clarifies that this specific provision and many other leak repair provisions in the final rule largely aligned with regulations under CAA section 608. When creating this final rule, EPA looked to align the provisions with the CAA while also building on the CAA regulations where appropriate (*e.g.,* changing the charge size threshold to 15 pounds for leak repair). Additionally, EPA notes that the leak repair rules under the CAA and this final rule were promulgated under two separate statutory authorities, and that the Agency did not propose to reopen the requirements under the CAA as part of this rulemaking. Thus, the Agency is not merging the requirements in the way the commenter suggest in this action. However, as previously stated we have evaluated how to make the leak repair provisions under the CAA and AIM Act streamlined and understandable. EPA disagrees that this final rule will cause confusion for owners and operators. As stated previously, this final rule is largely aligned with the leak repair requirements under CAA section 608.

g. Recordkeeping and Reporting

EPA is requiring recordkeeping requirements for refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant containing an HFC or a substitute for an HFC with a GWP above 53 under subsection (h) that are similar to those at 40 CFR 82.157(l). Where EPA is establishing requirements for recordkeeping, the record must be maintained for three years in either paper or electronic format. An owner or operator may contract out the record generation responsibilities but retains ultimate liability for compliance and must be able to access these records electronically or in hard copy from the facility where the appliance is located. All recordkeeping requirements can be found in 40 CFR 84.106(l). These records are the primary means for the facility to demonstrate compliance with the leak repair requirements, and EPA will review them when evaluating compliance. EPA will access these records in various ways, including, but not limited to, on-site review of the records or requesting them via an information request. In general, EPA is establishing the following recordkeeping requirements for owners and operators under subsection (h):

- Maintain records documenting the full charge of appliances;
- Maintain records, such as invoices or other documentation showing when refrigerant is added or removed from an appliance, when a leak inspection is performed, when a verification test is conducted, and when service or maintenance is performed;
- Maintain retrofit and/or retirement plans;
- Maintain retrofit and/or extension requests submitted to EPA;
- If a system is mothballed to suspend a deadline, maintain records documenting when the system was mothballed and when it was brought back on-line (*i.e.,* when refrigerant was added back into the appliance or isolated component of the appliance);
- Maintain records of purged and destroyed refrigerant if excluding such refrigerant from the leak rate;
- Maintain records to demonstrate a seasonal variance; and
- Maintain copies of any reports submitted to EPA under the reporting requirements in this action.

EPA is also requiring reporting and recordkeeping for refrigerant-containing appliances with a charge size of 15 pounds or more of a refrigerant containing an HFC or a substitute for an HFC with a GWP above 53 under subsection (h) that are similar to those at 40 CFR 82.157(m). The reporting requirements include notifications to EPA that include specified information when:

- The owner or operator is seeking an extension to complete repairs;
- The owner or operator is seeking an extension to complete a retrofit or retirement plan;
- The owner or operator is seeking relief from the obligation to retrofit or retire an appliance;
- An appliance leaks 125 percent or more of the full charge in a calendar year;
- The owner or operator is excluding purged refrigerants that are destroyed from annual leak rate calculations for the first time.

Additional detail on these recordkeeping requirements is available at 40 CFR 84.106(l). The recordkeeping and reporting requirements in this action for ALD systems are described in section IV.D.2 of this preamble.

As discussed in the proposal, the recordkeeping and reporting requirements support compliance with the leak repair provisions under the final rule for applicable refrigerant-containing appliances that contain HFCs or certain substitutes for HFCs as a refrigerant. For example, the requirements will control recordkeeping and reporting practices, processes, or activities for servicing and repair that involves HFCs or a substitute for an HFC. As discussed in section II.B of this preamble, EPA's authority to require recordkeeping and reporting under the AIM Act is also supported by section 114 of the CAA, which applies to the AIM Act and rules promulgated under it as provided in subsection (k)(1)(C) of the AIM Act. The recordkeeping and requirements related to the leak repair requirements under this rulemaking are applicable to the full range of appliances that are subject to the leak repair provisions, including those containing at least 15 pounds of refrigerant with limited exemptions, as described in section IV.C.2.b of this preamble for certain appliances. The recordkeeping and reporting requirements provide critical information about whether required actions were taken and are part of the suite of compliance tools included in this rule. Compliance with the overall leak repair requirements is intended to minimize the release of refrigerants, and the Agency considers these recordkeeping and reporting requirements necessary to readily assess compliance. Records that demonstrate noncompliance or are incomplete may be used for enforcement purposes. The requirements are informed in part by EPA's consideration of its experience implementing similar regulations under CAA section 608 at 40 CFR 82.157 and the recordkeeping and reporting requirements that have been used to ensure compliance with those provisions.

Furthermore, EPA notes that there are existing recordkeeping requirements at 40 CFR 82.156(a)(3) for technicians evacuating refrigerant from appliances with a full charge of more than 5 and less than 50 pounds of refrigerant for purposes of disposal of that appliance. These records are used to assess technicians' compliance with the disposal requirements for appliances between 5 to 50 pounds under 40 CFR part 82, subpart F and are not related to the owner/operator's compliance with the leak repair requirements. Additionally, EPA notes that the bulk of the appliances covered by the recordkeeping requirements at 40 CFR 82.156(a)(3) are residential air conditioning appliances, which are exempt from the leak repair provisions in this action. EPA did not reopen any of the provisions in 40 CFR part 82 through this notice-and-comment rulemaking, and thus the Agency did not propose any changes to the referenced recordkeeping requirements. The Agency does not view these recordkeeping requirements as being in conflict with the leak repair requirements in this final rule, nor does the Agency view them as redundant.

Comment: A commenter requested clarification on the effective date of leak repair requirements as it relates to recordkeeping, considering the leak rate calculation methodologies would require existing records in order to determine the leak rate. The commenter stated that some facilities with appliances with a charge size greater than 50 pounds may not have records because of the lack of existing leak repair requirements. The commenter requests clarity on what owners or operators should do if records are unavailable to determine the leak rate and determine if repairs are required.

Response: EPA acknowledges the commenter's concerns about accurately calculating the leak rate of appliances without previously available records. As discussed in section IV.C.3.a of this preamble, because no records are required for addition of refrigerants to an appliance prior to January 1, 2026, owners or operators may calculate leak rates for appliances containing an HFC or HFC substitute with a GWP greater than 53 as though there were no additions prior to that date. For example, if an owner or operator is using the annualizing method for the

first addition of refrigerant in calendar year 2026, the second term would be 365/365 (or ''1''). For subsequent additions the second term would be 365 divided by the shorter of the number of days since refrigerant was last added or 365. Alternatively, if an owner or operator is using the rolling average method for the first addition of refrigerant in calendar year 2026, the numerator would be the pounds of refrigerant added since the shorter of January 1, 2026, or the last successful follow-up verification test, if one was conducted in 2026. For subsequent additions the numerator is the pounds of refrigerant added since the shorter of 365 days or the last successful follow-up verification test.

Comment: One commenter requested the Agency clearly state in the regulatory text how and where required information is submitted electronically so the regulated community knows where and how to transmit the required information.

Response: EPA is creating a web-based platform for owners or operators to submit requests for extensions, chronic leak reports, and other reportable materials to the Agency. The Agency intends to provide additional information and guidance on reporting at *https://www.epa.gov/climate-hfcs-reduction/managing-use-and-reuse-hfcs-and-substitutes.*

Comment: One commenter suggested that recordkeeping and reporting requirements should not apply to residences, families, and landlords unless a threshold of several owned units is surpassed.

Response: As previously discussed in section IV.C.2 of this preamble, EPA is exempting appliances in the residential and light commercial air conditioning and heat pump subsector from the leak repair provisions of the final rule and those appliances are not subject to recordkeeping and reporting. EPA did not propose and is not finalizing any recordkeeping and reporting requirements for homeowners or landlords using air conditioning appliances in this subsector.

D. How is EPA establishing requirements for the installation of automatic leak detection systems?

EPA is finalizing aspects of the proposed ALD requirements, with modifications after consideration of the comments and information received on the proposed rule. EPA is finalizing that ALD systems must be installed and used for new and certain existing refrigerant-containing appliances in the IPR and commercial refrigeration subsectors with a charge size of 1,500 pounds or more. This provision applies to those refrigerant-containing appliances in the IPR or commercial refrigeration subsector that contain an HFC or a substitute for an HFC with a GWP greater than 53. In the proposal, new refrigerant-containing appliances installed after 60 days of the publication of the final rule in the **Federal Register** were required to install and use an ALD within 30 days of appliance installation. EPA proposed that existing refrigerant-containing appliances installed before 60 days after the date of publication of the final rule in the **Federal Register** were required to install and use an ALD system by one year after the date of publication of the final rule in the **Federal Register**. EPA is finalizing that beginning January 1, 2026, new refrigerant-containing appliances with a full charge of 1,500-pounds or greater in the IPR and commercial refrigeration subsectors are required to install an ALD system as a part of the overall appliance installation, either during the installation of the new appliance or within 30 days from when the new appliance is installed. Generally depending on the type of ALD system, it may be more practicable to install an ALD system during the appliance installation. The compliance date for the installation and use of ALD systems is over one year later than proposed to provide additional time for new appliance owners to procure and install ALD systems because additional time may be needed to secure a contractor or technician to install the ALD system, or there may be unforeseen delays in acquiring an ALD system. For existing IPR and commercial refrigeration appliances installed on or after January 1, 2017, and before January 1, 2026, EPA is requiring that ALD systems be installed and used by January 1, 2027. The change to the compliance date and applicability for existing IPR and commercial refrigeration appliances with a full charge of 1,500 pounds or greater was informed by commenters and further considerations by EPA to ease potential supply issues and facilitate compliance with this provision. For these appliances, the compliance date has been extended by one year (*i.e.,* to January 1, 2027) to allow additional time for existing appliances to comply with the provision, and the applicability of appliances affected by this provision has been altered to ensure that a proper supply of ALD systems is available to owners and operators. Further discussion of this change can be found later in this section.

As discussed in the proposal, ALD systems serve the purposes described in subsection (h)(1) to control any practice, process, or activity regarding servicing, repair, or installation of such appliances, that involves a regulated substance or a substitute for a regulated substance. When an ALD system detects a leak in a refrigerant-containing appliance covered by this rule, an owner or operator of the appliance is required to either perform practices, processes, and/or activities to determine whether service or repair of the appliance is necessary (*i.e.,* calculating a leak rate and assessing it compared to the applicable leak rate for the type of appliance) or, alternatively, preemptively repair the leak (*i.e.,* before adding refrigerant and calculating the leak rate). The Agency is explicitly encouraging preemptive repair of a leak as a compliance option to avoid the need to add refrigerant to an appliance with a known leak (which would otherwise generally be necessary to calculate the leak rate and determine if the applicable leak rate is exceeded). If the preemptive repair is being used as a compliance option, it must occur within 30 days (or 120 days where an industrial process shutdown is necessary) of the alert. Taken together, these requirements are expected to facilitate prompt repair of leaks, which further helps minimize releases of regulated substances from equipment and maximize the amounts of regulated substances remaining in the equipment for eventual recovery and reclamation.

In the case of preemptive repair, this compliance option provides the opportunity to repair an appliance that is known to be leaking prior to the addition of refrigerant. When refrigerant is added to an appliance that underwent preemptive repair, a leak rate calculation is still required after the addition of refrigerant. Owners or operators choosing to preemptively repair identified leaks per 40 CFR 84.108(h)(2) are not required to conduct an initial or follow-up verification test at the time of leak repair, unless the calculated leak rate performed after refrigerant is added is above the applicable leak rate. If the refrigerant-containing appliance is found to be leaking above the applicable leak rate threshold after preemptive repair the full suite of leak repair requirements (*e.g.,* initial and follow-up verification tests) will still apply. EPA clarifies that owners or operators using the rolling average method must continue to use the date of the last successful follow-up verification test or 365 days, whichever is shorter, to calculate the leak rate. If

multiple preemptive repairs (and associated refrigerant additions) are conducted within a time frame since the shorter of the last successful follow-up verification test or 365 days, the cumulative pounds of refrigerant added since the last successful follow-up verification test, or 365 days should be used to calculate the leak rate. For example, over a period of six months an owner or operator's ALD alerts them of a leak three times. The owner or operator, each time the ALD alarm alerts them, preemptively repairs a refrigerant-containing appliance and calculates the leak rate using the rolling average method. For the first refrigerant addition, the owner or operator uses the number of pounds added since the shorter of 365 days or the last successful follow-up verification test. For subsequent leaks detected by an ALD system, the owner or operator would use the cumulative amount of refrigerant added since the shorter of 365 days or the last successful follow-up verification test. If the cumulative amount of refrigerant added causes the refrigerant-containing appliance to exceed its applicable leak rate, then the owner or operator must follow through with the full suite of leak repair requirements.

The preemptive repair actions can be considered in determining whether the suite of leak repair requirements triggered by the exceedance of the applicable leak threshold have been satisfied, but the owner or operator of the appliance would still need to ensure that the leaks had been repaired according to the definition of repair and that the other requirements in 40 CFR 84.106 (*e.g.,* initial and follow-up verification tests, leak inspections (where applicable) and related recordkeeping) had been met. The timing of the leak repair requirements is the same as described in section IV.C.3.b of this preamble. If an owner or operator finds that the leak rate for a refrigerant-containing appliance is above the applicable leak rate threshold, the owner or operator must conduct an initial verification test in the 30-day timeframe for preemptive repair. A follow-up verification test must be conducted within 10 days of the successful initial verification tests, and leak inspections for portions of the refrigerant-containing appliance not monitored by an ALD system would begin after the date of a successful follow-up verification test.

As previously discussed in section IV.C.3.d of this preamble, EPA considers the leak inspections that are being codified at 40 CFR 84.106(g) and the requirements related to ALD systems that are being codified at 40 CFR 84.108 to be separate. However, in certain circumstances the use of ALD systems that meet certain requirements under the 40 CFR 84.108 is a compliance option that may be used in lieu of quarterly or annual leak inspections. Further, the regulations under CAA section 608 include provisions where an owner or operator of a covered appliance with ODS refrigerants may choose to use an ALD system in place of performing regular leak inspections as part of the leak repair provisions at 40 CFR 82.157. Nothing in this final rule changes the requirements related to ALD systems under CAA section 608 for equipment containing only ODS refrigerants. In other words, an owner or operator of an appliance that uses ODS-containing refrigerants will continue to be required to meet any and all requirements under 40 CFR 82.157 for that appliance, including if they choose to use an ALD system to comply with requirements under 40 CFR 82.157.

EPA understands that for reasons other than this rule, ALD systems are already in use to a certain extent. For example, some owners or operators may already use ALD systems to serve as an early warning system for detecting and repairing leaks. Some owners or operators may choose to install ALD systems from an economic perspective as early detection and repair of leaks can avoid costs of replacing the released refrigerant and operating equipment at suboptimal levels and/or the loss of perishable products due to failure to maintain required cooling. Further, the Agency is aware of safety standards that apply when using certain HFCs and/or substitutes for HFCs that have been classified as lower flammability. Lower flammability refrigerants in this context are those that are classified by ASHRAE as A2L refrigerants.[76] UL Standard 60335–2–40 currently requires the use of leak detectors for electrical heat pumps, air conditioners and dehumidifiers containing A2L refrigerants.[77] [78] Under that standard, leak detectors that detect pressure loss are required in cases where the prescribed A2L charge limit is exceeded (which is typically around four pounds for permanently installed applications). That standard also prescribes that refrigerant leak detectors be installed at the factory for applicable appliances and have factory-established set points for detection to avoid potential buildup of concentrations of flammable refrigerants.

Comment: EPA received overall support for the proposed ALD provision. One commenter stated that they strongly support any measures that will strengthen leak management practices. The commenter indicated that the greater stringency under the proposal, as compared to a similar leak repair provision in CAA section 608 and the requirements for ALD systems, will help detect leaks early and thereby mitigate environmental and financials risks associated with high-volume refrigerant leakage. The commenter also stated the ALD requirements will strengthen the State refrigerant management program requirements in California and Washington. Another commenter similarly expressed support for the provision stating that ALD systems leverage technology to mitigate leakage and strengthen refrigerant management programs. Two commenters supported EPA's efforts to implement leak detection and repair requirements through the AIM Act. One of the commenters shared that their refrigerant managers have found ALD systems useful for reducing fugitive refrigerant emissions and maximizing equipment performance and energy efficiency. Another commenter in support emphasized their shared goal to reduce leakage of HFCs and measurably reduce GHG emissions in the United States. Two commenters expressed support for the use of ALD systems for commercial refrigeration and IPR appliances with a charge size of 1,500 pounds or more of HFC-containing appliances. One of the commenters asked that EPA examine any comments from manufacturers of equipment and ALD systems to ensure compliance timelines can be met without delaying the installation of new equipment or

[76] ASHRAE Standard 34–2022 assigns a safety group classification for each refrigerant which consists of two alphanumeric characters (*e.g.,* A2 or B1). The capital letter indicates the toxicity class ("A" for lower toxicity) and the numeral denotes the flammability. ASHRAE recognizes three classifications and one subclass for refrigerant flammability. The three main flammability classifications are Class 1, for refrigerants that do not propagate a flame when tested as per the ASHRAE 34 standard, "Designation and Safety Classification of Refrigerants;" Class 2, for refrigerants of lower flammability; and Class 3, for highly flammable refrigerants, such as the hydrocarbon refrigerants. ASHRAE recently updated the safety classification matrix to include a new flammability subclass 2L, for flammability Class 2 refrigerants that burn very slowly.

[77] UL. 2019. "Understanding UL 60335–2–40 Refrigerant Detector Requirements." *https://www.ul.com/insights/updated-requirements-refrigerant-detection-systems.*

[78] UL 60335–2–40, 2019. Household And Similar Electrical Appliances—Safety—Part 2–40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers. Third Edition. November 1, 2019.

implementation of ALD systems on existing equipment.

Several commenters in support of the ALD requirements discussed how the provision would provide additional benefits and/or support existing efforts for refrigerant management. One commenter stated that ALD systems align with their commitment to environmental stewardship while maintaining the highest standards of service quality. Another commenter in support of the leak repair and ALD requirements stated the provisions would minimize releases from equipment and significantly reduce costs for businesses. The commenter provided information that estimated each supermarket in the United States leaks roughly 875 pounds of HFCs per year at a rate of two parts per million (ppm) to 182 ppm, and all supermarkets in the United States leak emissions equivalent to burning 49 billion pounds of coal. As discussed in section IV.C.3, several commenters supported the ALD provisions as the provisions further apply a LRM approach to HFC management.

Conversely, one commenter stated the proposed ALD requirements are not consistent with part 82 ODS requirements, where ALD systems are a compliance option, and should be amended to align with those requirements. As further discussed in section IV.C.3.f of this preamble, another commenter asserted that the AIM Act does not confer limitless authority to EPA to impose the expansive and unnecessarily burdensome leak detection and repair requirements set forth in the proposed rule.

Response: EPA is finalizing required use of ALD systems for a specific set of IPR and commercial refrigeration appliances with a charge size of 1,500 pounds or more. The Agency acknowledges comments in support of the ALD provision and agrees with commenters on the environmental benefits, reduction of financial risks, and fugitive emissions associated with ALD requirements. EPA also agrees with commenters that the ALD provision will strengthen refrigerant management programs in States that require ALD. EPA acknowledges the analysis of the amount of emissions avoided by the ALD provision. The Agency also agrees with one commenter's statement that this provision expands on requirements that previously applied to HFCs under CAA section 608 and will provide additional benefits from reconsidering the requirements under the AIM Act.[79] EPA acknowledges these comments and other comments in support of the provision.

The Agency acknowledges comments in support of the use of ALD in IPR and commercial refrigeration with a full charge of 1,500 pounds or greater. The applicability and charge size threshold of the provisions are discussed in further depth later in section IV.D.1. The Agency did review comments from ALD system manufacturers, per the commenter's suggestion, and has responded accordingly throughout section IV.D.

The Agency disagrees with one commenter's suggestion that the Agency realign the ALD provision with 40 CFR part 82, subpart F and leave the utilization of ALD systems solely as a compliance option. The rules in 40 CFR part 82, subpart F are based on CAA section 608 which is based on a different statutory provision. While EPA concluded that it is appropriate to align many aspects of the leak repair requirements in this rule with those under CAA section 608, for certain requirements, such as this one, the conclusion to finalize a provision that is different from the requirement under CAA section 608 is also appropriate. In the time since EPA finalized that requirement in 2016, ALD systems of many types, direct and indirect, are now more widely available and the Agency has developed a better understanding of how these various kinds of ALD systems could be used to achieve the purposes of subsection (h). As discussed previously in this section, the Agency is aware of widespread use of ALD systems used to comply with safety standards. The same or similar ALD systems can be utilized for the purposes of leak detection to support the ALD requirements. Moreover, ALD systems have been used by those seeking to monitor their systems for various reasons besides compliance with regulations ranging from meeting environmental stewardship goals to reducing costs of refrigerant by detecting and subsequently repairing leaks. EPA views leaky refrigerant-containing appliances with high charges as appliances where the utilization of ALD systems is particularly valuable, given that it may take some time for an owner or operator to become aware of a leak through other methods and given the amount of refrigerant that could leak from the system while a leak is undetected. The requirements in the final rule for commercial refrigeration and IPR appliances with a charge size of 1,500 pounds or greater to install and use ALD systems will help owners or operators identify leaks in such equipment earlier so that they can take corrective action to limit the release of refrigerant from the leak. Detection of leaks in equipment is a critical step in minimizing the release of HFCs from that equipment. Thus, requiring use of ALD in systems with charges of this magnitude is one way that the regulations work to achieve the purpose identified in subsection (h)(1) of minimizing releases of HFCs from equipment. Because the HFCs that remain in the equipment can later be recovered and reclaimed, this requirement also helps serve the purpose of maximizing reclamation, also identified in subsection (h)(1).

EPA addresses the comments on legal authority in section IV.C.3.f of this preamble.

Comment: Several commenters opposed the compliance dates for new appliances. One commenter expressed concerns that the 30-day timeline for installation would be unfeasible due to current inventories, supply chain constraints, and labor shortages. The commenter suggested allowing at least a one-year compliance period for systems installed within one year of publication of the final rule. Another commenter echoed the need for an additional year after publication of the final rule and stated that installation projects are often planned months to years in advance. Both commenters stated that additional time would allow for the preparation of operating procedures and training of personnel to operate and maintain equipment. One commenter stated the proposal's compliance dates were unclear and inadequate given the anticipated demand created by the rule's provisions.

Response: EPA is finalizing a compliance date of January 1, 2026, for new IPR and commercial refrigeration systems with a full charge of 1,500 pounds or greater. In the proposal, the compliance date for new appliances was tied to the final rule's publication in the

[79] The commenter also indicated that the requirements that applied to certain substitute refrigerants under CAA section 608 were "vacated." While actions under CAA section 608 are outside the scope of this rulemaking, the Agency notes for purposes of clarity and to avoid confusion that as discussed in greater detail in section III.C.1., EPA issued a rule in 2020 under section 608 which rescinded the 2016 extension of the leak repair requirements to appliances using HFCs and other non-exempt substitute refrigerants (85 FR 14150, March 11, 2020). Thus, it was a rulemaking by EPA that resulted in the leak repair requirements in 40 CFR 82.157 no longer applying to appliances that use substitute refrigerants. While petitions for judicial review were filed on the 2020 rule, the case is currently in abeyance and the court has not issued any final decision nor has it vacated those requirements.

Federal Register and would have required the installation of an ALD system within 30 days of appliance installation. In the final rule the requirement for newly installed equipment will begin January 1, 2026, though EPA is retaining the requirement to install and use ALD systems within 30 days of appliance installation. The additional year should address some commenters' concerns with procurement, planning, and training of personnel. The new compliance date also allows owners or operators who may be in the process of planning an appliance installation project additional time to comply with the ALD requirements. Furthermore, the compliance dates for both new and existing systems are more clearly defined which provides owners or operators additional clarity for when they will need to install and use an ALD system.

The Agency is finalizing that an ALD system must be installed and used by January 1, 2027, if the existing refrigerant-containing appliance was installed on or after January 1, 2017, and before January 1, 2026. EPA narrowed the refrigerant-containing appliances subject to this provision to those that were installed approximately 10 years ago or less because appliances in the two categories covered in the final rule (*i.e.,* commercial refrigeration and IPR), have very long useful lifetimes. The final rule's applicability cutoff date for existing systems is set to January 1, 2017, because the Agency considers existing appliances installed within that timeframe to still have a majority of their useful life to operate. For example, IPR systems generally have a useful life of 20–25 years. Thus, an IPR system installed on January 1, 2017, might have an additional 10–15 years of life before the appliance would need to be replaced. Commercial refrigeration appliances at charge sizes at 1,500 pounds or greater have a similar useful life of about 18 years. EPA recognizes that the provision in the final rule does not have the same breadth of emissions benefits as the provision in the proposed rule, but the Agency estimates that a significant portion of existing appliances are covered by the final rule's provisions. While the Agency proposed to include all existing appliances in these categories, in this final rule, the Agency has determined to include a subset of appliances (*i.e.,* those installed since January 1, 2017) rather than all appliances and to include two of three categories of refrigerant-containing appliances (*i.e.,* IPR and commercial refrigeration) thus narrowing the number of affected appliances. Limiting the number of affected refrigerant-containing appliances should also ease concerns pertaining to the supply of ALD systems as only approximately 44 percent of existing appliances would be subject to the ALD installation and use requirements compared to the proposal.

Comment: Various commenters shared concerns about the compliance date for existing IPR and commercial refrigeration appliances and the supply of ALD systems. One commenter claimed that the complexity of integrating new ALD systems into an existing facility's processes necessitates more than a year to develop and construct an ALD project. The commenter stated that the compliance date would result in a single, peak-demand year; thus, EPA should allow for a three-year compliance window for existing appliances. The commenter also claimed that EPA has no statutory obligation to require compliance within a shorter time period. Another commenter echoed similar concerns on technician and supply chain shortages regarding supermarket systems, stating that it would be impractical for industry to comply on time under the proposal and that compliance costs will likely be significantly higher than what EPA projects due to demand for ALD systems. The commenter stated that supermarket refrigeration systems can have 30 to 50 cases, each with an evaporator, and a large number of components which would require sensors adding to the amount of time to implement an ALD system. The commenter also stated that "off-the-shelf" ALD systems may require significant modification and thus require more time to implement. For these reasons the commenter requested the compliance date for new systems be no earlier than January 1, 2029. Another commenter suggested the compliance date for existing systems be at least two years after publication to ensure owners and operators have the needed lead time to design, procure, install, and validate ALD systems for their operations. The commenter stated that EPA may be underestimating demand in its ALD analysis and that increased demand could drive up the costs of ALD systems and slow down delivery and installation time if existing ALD manufacturers do not have the capacity to meet demand. Another commenter recommended EPA consider an exemption for commercial system operators from the proposed ALD requirements if they can prove they would transition to an ultra-low-GWP refrigerant before January 1, 2027.

Response: The Agency is finalizing a compliance timeline for existing systems later than proposed with the caveat that not all existing IPR and commercial refrigeration appliances are subject to the final rule's ALD provisions. The final rule exempts any appliance installed before January 1, 2017, from being required to install an ALD system. EPA estimates that approximately 56 percent of total existing appliances would be excluded from the ALD provision as proposed. Additionally, EPA estimates that around 25,000 existing refrigerant-containing appliances would be subject to the ALD requirements in the final rule, which is significantly lower than the number of refrigerant-containing appliances subject to the ALD provision in the proposal. Owners or operators with existing refrigerant-containing appliances subject to this provision will have over two years to install an ALD system. This change will reduce the immediate demand of ALD systems and provide additional lead time for owners or operators to procure, design, and install ALD systems for their operations. The Agency notes that commenters did not provide sufficient evidence on how the state of the ALD or technician market would affect an owner or operator's ability to install an ALD system. However, as stated previously, the changes to the compliance date and applicability should ease concerns related to market shortages. Furthermore, the additional time for existing refrigerant-containing appliances subject to the ALD requirements will reduce costs associated with the demand for ALD systems, as one commenter stated. Further discussion on the costs and benefits of the ALD provision can be found in section IV.B.2.

Regarding one commenter's statements on the implementation of ALD systems in supermarkets, the Agency disagrees that additional time beyond January 1, 2027, will be necessary. EPA understands that supermarket systems may be custom built or have additional complexities; however existing ALD systems can be applied to such systems even if they are considered to be "off-the-shelf" as the commenter describes. The commenter also did not provide specific information on how existing ALD systems would be inadequate in providing leak monitoring for their supermarket systems or why existing ALD systems would require significant modifications in order to be implemented. The Agency also disagrees that additional time would be

needed because multiple cases and components would need to have sensors, as the Agency is not prescribing the type of ALD system used by an owner or operator. To clarify, EPA is requiring an owner or operator to use either a direct or indirect ALD system to comply with the ALD requirements in this final rule. It is up to the owner or operator's discretion to decide which type of ALD system, that meets the standards described in 40 CFR 84.108, best suits their refrigerant-containing appliance. Although the Agency disagrees that either type of ALD system will be difficult to install, if the commenter finds direct ALD systems as too onerous to implement, they have the option to install an indirect ALD system to comply with the provision. Additionally, CARB's refrigerant management program has required the use of ALD for refrigeration systems above 2,000 pounds since 2011. Certain supermarket systems are captured by this regulation and have been required to use ALD for over a decade. As previously stated, EPA views the implementation of ALD for certain appliances with large charge sizes as important to serve the purposes described in subsection (h) to minimize the release of regulated substances. For these reasons, EPA disagrees with the commenter's suggested compliance date of January 1, 2029.

With respect to the comment requesting a three-year compliance timeframe for existing operations and further stating that EPA has no statutory obligation to require compliance within a shorter time frame, EPA responds that it recognizes that the AIM Act does not expressly establish a specific timeframe for when regulated entities need to comply with regulations under subsection (h)(1) of the AIM Act, leaving EPA discretion to determine what time period is appropriate in the context of the specific regulations promulgated. Congress identified three purposes for regulations under subsection (h)(1): maximizing reclamation, minimizing releases of HFCs from equipment, and ensuring the safety of technicians and consumers. Congress's use of the terms such as ''maximize'' and ''minimize'' in this context indicate that it intended for the regulations authorized under subsection (h)(1) to have a substantive and meaningful effect, taking into account the other statutory considerations such as whether the controls are appropriate. Because the compliance date could affect the amount of HFC emissions that occur from equipment or the amount of HFCs available for reclamation, these terms inform EPA's consideration when it is determining whether to establish a later compliance date for regulations under subsection (h)(1), and if so, what compliance date is appropriate. Thus, in establishing the compliance date for the requirements to use and install ALD systems under the final rule, EPA's objective is to allow sufficient time—but not more time than is needed—to facilitate compliance and achieve the regulatory objectives. For example, if EPA were to establish an unnecessarily long compliance date for installation and operation of ALD systems, that could result in emissions for HFCs from equipment that could have been prevented through an earlier compliance date. By the same token, establishing a compliance date that does not provide sufficient time for compliance could also have a deleterious effect on the regulations' ability to achieve these purposes if the result is that entities fail to properly comply.

The Agency acknowledges one commenter's suggestion to provide a narrow exemption for owners or operators who could prove they would transition to a lower-GWP refrigerant-containing appliance. The Agency responds that it is not finalizing the exemption that the commenter describes because owners or operators who transition to a lower-GWP refrigerant are not necessarily exempt from the ALD and broader leak repair requirements in this final rule. The overarching applicability for refrigerant-containing appliances subject to these requirements in the final rule is whether or not the refrigerant-containing appliance uses an HFC or substitute for an HFC with a GWP greater than 53. For example, an owner or operator at the end of a refrigerant-containing appliance's useful life may transition to a lower-GWP refrigerant that contains an HFC or substitute with a GWP greater than 53 and would thus still be required to install and use an ALD system. In some cases, an owner or operator will transition to a refrigerant that does not contain an HFC or does not have a GWP greater than 53 (*e.g.,* R–477) and is not required to install an ALD system.

Comment: The Agency also received general comments regarding the compliance dates for the final rule's ALD provisions. One commenter, acknowledging the need for proper leak detection, expressed concern that the proposal's timelines were too aggressive and that many of the requirements and leak detection methods needed further clarification. Another commenter who generally supported the ALD provision opposed any compliance date less than three years from publication of the final rule, on grounds that it will take manufacturers and appliance owners considerable time to plan, procure, and install ALD systems. One commenter proposed that EPA could consider making the compliance date earlier. Another commenter asserted that technicians would need to be trained and re-certified to handle HFCs and work with ALD equipment. They claim ALD systems were not broadly used for any of the ODS-substitutes when the 40 CFR part 82 rules for HFC management under the CAA were in effect. The commenter requested EPA finalize a compliance date at least 180 days after publication of the final rule.

Another commenter claimed the proposed rule's compliance dates were impractical for large aviation and defense manufacturers. The commenter stated that manufacturing military, aerospace, and space end-use products is often subject to significant oversight or control by other Federal entities such as the U.S. Department of Defense and the FAA, which can include scrutiny of manufacturing processes. Further, the commenter claimed that some refrigerant-containing appliances used for IPR are uniquely designed and may not be compatible with ''off-the-shelf ALD'' systems; thus, engineering design modifications or re-engineering could be necessary to ensure functionality of both the IPR equipment and the ALD system. The commenter requested EPA extend the compliance deadlines until 2027 for these reasons and also stated that the extension would be consistent with EPA's extension of the IPR transition date in the 2023 Technology Transitions final rule.

Response: The Agency is finalizing a new compliance date for new and existing refrigerant-containing appliances subject to the ALD provisions. New IPR and commercial refrigeration appliances that contain an HFC or HFC substitute with a GWP greater than 53 are required to install and use an ALD system starting January 1, 2026. EPA expects that the installation of an ALD system will be a part of the overall refrigerant-containing appliance installation; however, owners or operators have 30 days after the installation of a refrigerant-containing appliance to install and use an ALD system. For existing refrigerant-containing appliances installed on or after January 1, 2017, owners or operators are required to install and use an ALD system by January 1, 2027. The changes to the compliance date should address commenter's concerns and requests for additional time (*e.g.,* 180 days, two years). The Agency has also

provided more information on the leak detection requirements in this section and additional clarity on direct and indirect ALD systems in section IV.D.1, as requested by one commenter. EPA disagrees that the compliance timeline should be extended to at least three years after the final rule's publication. Both new and existing IPR and commercial refrigeration appliances have been given additional time to comply with the ALD requirements which will allow owners or operators the necessary time to plan, procure, and install an ALD system. Further, the applicability for existing IPR and commercial refrigeration appliances has been changed to ensure the supply of ALD systems is available and further facilitate compliance with the requirements. Existing IPR and commercial refrigeration appliances have over two years to install an ALD system. Furthermore, the Agency is not merging the overall compliance dates for the ALD requirements because new IPR and commercial refrigeration appliances will be able to readily integrate ALD systems. As previously stated, EPA views the ALD requirements for certain appliances with large charge sizes as important to serve the purposes described in subsection (h) to minimize the release of regulated substances. For these reasons, EPA finds the compliance dates in this final rule to be appropriate and disagree with the commenter's request for three years to comply with these requirements.

EPA acknowledges one commenter's proposition that the Agency could hasten the compliance date for existing equipment, However, EPA is not finalizing an earlier compliance date. The Agency does not agree that an earlier date can be met by all regulated entities for many of the reasons stated throughout this section and offered by other commenters. However, a regulated entity could choose to install an ALD system ahead of the compliance date, and there may be a variety of benefits to the regulated entity in doing so, including reduced refrigerant emissions and associated costs.

The Agency responds to one commenter's points that ALD systems were not broadly used for any of the ODS-substitutes when the part 82, subpart F rules for HFC management were in effect. The State of California has mandated the use of ALD for HFC-containing appliances with a charge size above 2,000 pounds since 2011. The commenter's insinuation that ALD use has historically been minimal is not accurate. Moreover, ALD systems have been used for those seeking to monitor their systems for various reasons besides compliance with regulations ranging from meeting environmental stewardship goals to reducing costs of refrigerant by detecting and subsequently repairing leaks. EPA also disagrees with the commenter's assertion that technicians need training and re-certification to handle ALD systems. To the extent that this comment relates to technician certification requirements under CAA section 608, the Agency did not reopen CAA section 608 regulations through this action under subsection (h) of the AIM Act, including the technician certification requirements. Accordingly, the Agency is not addressing comments related to requirements under CAA section 608 in this final rule, as they are beyond the scope of this rulemaking and require no further response. For purposes of public information, the Agency notes that it periodically updates its test bank of questions to become a certified technician under CAA section 608 to reflect regulatory and market changes. The Agency took advanced comments on technician certification. The information the Agency received may be used to inform a future rulemaking. The Agency notes that CAA section 608 technician certification is not intended to replace all technician education and training and anticipates that the same would be true for any future AIM Act certification program. The Agency understands that employers may provide additional onsite training and that industry organizations provide information on regulatory updates and market changes.

EPA recognizes that other Federal agencies have various roles and responsibilities defined by different statutes. The Agency disagrees, however, that the ALD provisions being finalized in this action will spur significant oversight and scrutiny, as one commenter asserted. The final rule requires a specific portion of IPR and commercial refrigeration appliances (*i.e.,* with charge sizes of 1,500 pounds or more) to install and use ALD systems. These appliances may be used by the military (*e.g.,* commissary) or at airports, for example, but these uses are not functionally different from the uses of other appliances in these same subsectors at other locations.[80] The Agency's longstanding CAA section 608 regulations already includes leak repair requirements for the same equipment. The Agency acknowledges that subsection (h)(3) of the AIM Act provides that EPA "may coordinate" with certain other EPA regulations that involve "the same or a similar practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment" or reclaiming, and EPA has coordinated many aspects of this final rule. The commenter also asserted that moving the compliance date to 2027 would align the ALD requirements in the final rule with the IPR transition in the 2023 Technology Transitions Rule. EPA has extended the compliance date to January 1, 2027, for existing refrigerant-containing appliances but clarifies that the decision was not based on an alignment with the 2023 Technology Transitions Rule. The Agency finds such an alignment in this instance to be unfounded. The 2023 Technology Transitions Rule covers new equipment and setting GWP limits. This provision under subsection (h)(1) is focused on the management of HFCs and in this case in refrigerant-containing appliances.

[80] The Agency has provided exceptions for military equipment used in deployable and expeditionary applications, as well as space vehicles.

1. Automatic Leak Detection Requirements

In the final rule, refrigerant-containing appliances in the commercial refrigeration and IPR subsectors with a charge size of 1,500 pounds or more with a refrigerant that contains an HFC or a substitute for an HFC that has a GWP above 53 are required to use ALD systems. The refrigerants covered are the same as for the leak repair provisions, but the full charge size cutoff for using ALD systems (*i.e.,* 1,500 pounds) is greater than that of the other leak repair provisions in this rulemaking (*i.e.,* 15 pounds). EPA acknowledges that using ALD systems for refrigerant-containing appliances that have lower refrigerant charge sizes (*i.e.,* below 1,500 pounds) may be an option an owner or operator could take so they are alerted to leaks sooner. Additionally, owners or operators may choose to install and use ALD systems in lieu of quarterly and annual leak inspections as previously discussed in section IV.C.3.d. As discussed in the proposal, EPA considered several potential options of the threshold for requiring ALD systems (*e.g.,* 15 pounds, 50 pounds, 500 pounds) and other thresholds used internationally and by certain States (*i.e.,* California and Washington). However, EPA is not requiring use of ALD systems for refrigerant-containing appliances with less than 1,500 pounds. As discussed later in this section, EPA also considered the supply of ALD systems when determining the applicability of appliances because adequate supply of

ALD systems is required to facilitate compliance with this provision. Larger refrigeration appliances have potential to leak greater amounts of refrigerant, such that owners or operators use of an ALD system to quickly detect leaks further supports the statutory purposes in subsection (h) of minimizing releases of HFCs from equipment and maximize the amount of HFC that is available for reclaiming. Moreover, EPA understands that owners or operators of appliances with larger charge sizes (*i.e.,* at or above 1,500 pounds) may be more likely to have in place refrigerant management plans, routine equipment inspections, or other formal or even informal mechanisms aimed at reducing refrigerant losses for which ALD will provide additional support.

Comment: The Agency received many comments in support of the charge size threshold. One commenter expressed support for the proposed threshold given the cost burden associated with the installation of some ALD systems. Another commenter expressed support for the charge size threshold and stated that the requirements will help reduce emissions from large appliances at greater risk of leaks. One commenter in support of the provision stated that ALD systems are widely available and quickly becoming best practice for leak reduction, even for smaller systems.

Conversely, one commenter stated that EPA should change the charge size threshold to 2,000 pounds or more and asserted that the proposed ALD installation requirements would be unduly burdensome for retailers with large refrigeration systems, particularly in the retail food sector. The commenter stated that significant costs would be imposed because of equipment costs and technician fees. One commenter suggested the Agency lower the ALD charge size threshold to 100 pounds per refrigerant circuit. Alternatively, the commenter suggested the ALD provision may be better suited if it was based on annual leak rates instead of charge size. For example, if an owner or operator had equipment designed to contain more than 250 pounds of refrigerant that had leaked more than 20 percent for two years, ALD would be required to be installed within six months. This would target problematic systems and avoid unnecessary added cost for non-leaky systems. Another commenter felt the inclusion of ALD for systems at or above 1,500 pounds was superfluous because the flammability of certain refrigerants below a GWP of 150 at high charge sizes would already necessitate ALD to comply with building safety codes. The commenter suggested that EPA defer to State and local building codes and make adjustments to determine if the requirement is necessary.

Another commenter provided a case study of a leak survey on a university campus analyzing appliances with a charge size at or below 50 pounds. The commenter maintained that small-to-medium-sized appliances contributed an unexpectedly large portion of their refrigerant emissions and that without a lower ALD charge size threshold, facility mangers would likely not allocate sufficient resources to reducing leaks from smaller equipment. The commenter stated that ALD systems are commercially available for medium-sized cooling appliances that have a charge size much lower than 1,500 pounds.

Response: The Agency is finalizing the ALD charge size threshold of 1,500 pounds for IPR and commercial refrigeration appliances that contain an HFC or HFC substitute above a GWP of 53. The 1,500-pounds threshold applies to a large group of commercial refrigeration and IPR appliances that have a high potential to leak large amounts of refrigerant. EPA considered various options in the proposal and informed by the comments finds the 1,500-pound charge size threshold to be appropriate. The Agency acknowledges numerous comments in support of the provision.

The Agency disagrees with the comment that the ALD charge size threshold will be overly burdensome for supermarket refrigeration systems. Supermarket systems will uniquely benefit from the inclusion of ALD as a large majority of supermarkets utilize commercial refrigeration appliances with a charge size at or above 1,500 pounds and that, as this commenter noted and is discussed in section IV.C.3.b, have a high average leak rate of 25 percent.[81] Early identification and repair of leaks may save owners and operators money on the costs of refrigerant, which would have otherwise been lost until an owner or operator noticed a decline in performance and added refrigerant. Early detection of refrigerant leaks may also lead to some other savings that are not accounted for in the analysis presented in the Economic Impact and Benefits TSD, such as prolonged life of equipment and reduced spoilage of food or other temperature-sensitive items contained in or processed by refrigerant-containing appliances. EPA notes that the commenter did not provide adequate data to suggest that the retail food industry would be significantly burdened by the provision. EPA recognizes that there are compliance costs and benefits associated with the ALD provision, including from detecting and repairing leaks early. EPA also acknowledges that supermarkets are moving to smaller charge sizes. By including only appliances installed on or after January 1, 2017, the Agency is finalizing an approach that excludes refrigerant-containing appliances that are closer to said appliance's EOL, providing owners or operators additional flexibility. EPA also disagrees with one commenter's suggestion to require ALD based on high annual leak rates. The commenter claims that this would accurately target leak-prone appliances and reduce the burden on non-leaky equipment. EPA disagrees that this approach would function better than the final rule's inclusion of IPR and commercial refrigeration appliances with a charge size at or above 1,500 pounds. The commenter's approach is an interesting alternative that would use a triggering event to denote which appliances are to be subject to the requirements. However, as mentioned in the response to comments on the supermarket sector, the referenced 25 percent average leak rate would mean on average the supermarket sector typically would exceed the triggering event suggested by this commenter. While a triggering event could be considered in the future, in particular if EPA were to consider subsectors with lower typical charge sizes, in this instance EPA did not receive sufficient information to support this approach.

The Agency also disagrees with one commenter's assertion that the inclusion of ALD is unnecessary due to the State and local building codes requiring ALD for flammable refrigerants. If there are State and local requirements to install ALD systems that will detect refrigerant emissions, these requirements are complementary to EPA's intent. However, these State or local requirements do not supplant the Agency's requirements or their intent. Many appliances not using a flammable refrigerant will be affected by the final rule's ALD provisions, but the requirements are applicable to all refrigerants, not just the flammable refrigerants. Furthermore, the Agency has previously acknowledged that UL Standards for A2L refrigerants requires the use of leak detection elsewhere in this section. The standards related to A2L refrigerants and State and local building codes do not nullify the authority of EPA to regulate the use of

[81] See comment ID EPA–HQ–OAR–2022–0606–0138 in the docket for this rulemaking, available at *https://www.regulations.gov/comment/EPA-HQ-OAR-2022-0606-0138.*

ALD systems to minimize the release of regulated substances.

With regard to the commenter that advocated for the use of ALD of medium-sized appliances because of their findings of substantial leaks from small and medium-sized appliances on a university campus, the Agency recognizes that smaller systems under 1,500 pounds may still be prone to leaks and thus the Agency is also finalizing the separate leak repair requirements for refrigerant-containing appliances with 15 pounds or more of refrigerant. EPA agrees with the two commenters who stated that ALD systems are commercially available for medium-sized appliances and are becoming the best practice for refrigerant management. While EPA is not finalizing a lower threshold at this time, EPA may consider a lower charge size threshold in a future notice-and-comment rulemaking. The Agency encourages consideration of using ALD systems by the owners and operators of refrigerant-containing appliances with charge sizes of less than 1,500 pounds of refrigerant.

Comment: EPA received several comments regarding the applicability of the proposed ALD provision. Two commenters suggested adding comfort cooling. One of the commenters specifically asked the Agency to consider including all new and existing RACHP appliances, IPR, commercial refrigeration, and comfort cooling systems with charge sizes at or above 200 pounds. The commenter stated that 200 pounds was a point of inflection for proposed GWP limits under the 2023 Technology Transitions Rule and would promote an enhanced approach over European Union standards, expediting emissions reductions in the heating, ventilation, air conditioning, and refrigeration (HVACR) industry. The commenter also expressed concerns that the 1,500-pound threshold may incentivize design modifications aimed at installing appliances that are exempt from the ALD requirements. They further asserted that owners or operators may install multiple smaller appliances with lower charge sizes. Another commenter similarly claimed that the rule's charge size threshold and applicability of appliances would exempt a high percentage of commercial facilities from the ALD requirements and undermine the intent of the rule. The commenter suggested that EPA could consider the total cumulative mass of refrigerant being used by commercial refrigeration and IPR appliances at a facility location, rather than the mass of refrigerant being used by individual appliances. Alternatively, the commenter suggested EPA could lower the charge size threshold to 1,000 pounds per facility and lower the threshold to 500 pounds of refrigerant in an individual appliance.

Response: EPA is finalizing as proposed that the ALD requirements only apply to IPR and commercial refrigeration appliances with a charge size of 1,500 pounds or more. EPA considered and is not establishing requiring ALD systems for all refrigerant-containing appliances above a certain charge size. Instead, after considering the opportunities to reduce leaks and thus minimize emissions, EPA decided to limit this requirement to commercial refrigeration and IPR appliances. EPA is not establishing requirements for using ALD systems for appliances used for comfort cooling. The Agency understands that refrigerant-containing appliances used for comfort cooling typically do not leak to the same degree as appliances in the commercial refrigeration and IPR subsectors. Medium (charge size of 200 to 2,000 pounds of refrigerant) and large (charge size 2,000 pounds or greater of refrigerant) comfort cooling appliances average annual leak rates of around 10 percent, while medium and large commercial refrigeration and IPR appliances have average leak rates that are around two to three times greater.[82] This is consistent with EPA's requirements for leak inspections, such that appliances used for comfort cooling would not have more frequent required leak inspections as a part of the leak repair provisions (see section IV.C.3.d). EPA previously acknowledged in the 2016 CAA section 608 Rule (81 FR 82272, November 16, 2016) that larger commercial refrigeration and IPR appliances tend to have larger annual average leak rates than comfort cooling appliances. Further, larger commercial refrigeration and IPR appliances would have a greater amount of refrigerant lost compared to comfort cooling appliances even if the leak rates were the same since these larger appliances typically have significantly larger refrigerant charge sizes. Thus, the primary benefit of early leak detection from an ALD system would not be as useful for appliances solely used for comfort cooling. However, if an appliance has a dual function (*e.g.,* IPR and comfort cooling), an ALD system would be required. For example, if the refrigerant coming off the evaporator in an industrial process were cool enough, it could be directed towards co-located offices or break rooms to provide air conditioning, before being routed back to the compressor(s). Such a system would provide both IPR and comfort cooling, and for purposes of this rule, an ALD system would be required.

Similarly, EPA disagrees with one commenter's suggestion to include all RACHP refrigerant-containing appliances with a charge size above 200 pounds. As discussed previously in this section, the Agency has changed the applicability of existing IPR and commercial refrigeration appliances to ensure the supply of ALD systems can meet the demand created by this final rule's requirements. Lowering the charge size threshold to 200 pounds (or any other threshold below 1,500 pounds) may create additional market disruptions and hamper the uptake of ALD systems for larger IPR and commercial refrigeration appliances, which this rule is specifically capturing, and thus diminish the potential emissions reductions for larger refrigerant-containing appliances. While the Agency encourages the use of ALD systems at any charge size, EPA does not intend to require such installation in this rulemaking. The Agency may reconsider the applicability of certain refrigerant-containing appliances at a specific charge size in a future notice-and-comment rulemaking.

EPA responds to the commenter's scenario that owners or operators may circumvent the final rule's ALD provision by installing multiple smaller appliances. The Agency acknowledges it is possible that refrigerant-containing appliances that previously used 1,500 or more pounds of refrigerant could be designed to use 1,450 or less pounds of refrigerant. While EPA maintains its authority to take action if an entity violates this final rule's provisions, redesigning refrigerant-containing appliances to use less refrigerant does not violate the rule's requirements; it is instead a means to avoid becoming subject to the current requirements for the installation and use of ALD systems. Furthermore, using less refrigerant will also result in minimizing emissions, so if an owner or operator is able to install or redesign a refrigerant-containing appliance to use less refrigerant that will serve the purposes described in subsection (h)(1) to minimize the release of refrigerants from equipment. The Agency disagrees with the request to consider the total cumulative mass of refrigerants at a facility location, as suggested by the commenter, as such an approach may further complicate the ALD provision and implicate systems that are below the 1,500-pound charge size threshold. As previously stated, the

[82] Average annual leak rates by appliance type and charge size are provided in the Economic Impact and Benefits TSD.

Agency is concerned with ensuring that the supply of ALD systems can meet the demand for ALD systems. The Agency did not propose and is not finalizing the charge size threshold to operate in the manner suggested by the commenter.

As a consideration in setting the threshold, EPA accounted for the extent to which ALD systems may already be in use and the types of equipment to which they are marketed. For example, many larger refrigeration appliances (*e.g.,* a charge size of 1,500 to 2,000 pounds or more) may already use ALD systems per certain State requirements or to reduce negative economic impacts associated with replacing leaking refrigerant. EPA also considered the availability of ALD systems for refrigeration appliances in the United States. In the TSD titled *American Innovation and Manufacturing Act of 2020—Subsection (h): Automatic Leak Detection Systems* in the docket for this rulemaking, EPA assessed the market presence and number of manufacturers of ALD systems that sell to the U.S. market. EPA notes that most manufacturers make direct ALD systems, while indirect ALD systems are newer technologies on the market.[83] Since ALD systems have generally only been required for larger refrigeration appliances per certain State requirements, or are likely used in refrigeration appliances with larger charge sizes to avoid potential economic burden associated with replacing refrigerant that has leaked, EPA anticipates that the current market presence of ALD system manufacturing is generally aligned to demand for ALD systems for larger IPR and commercial refrigeration appliances. The threshold and the change in compliance dates and applicability for this provision, accounts for the potential increase in demand for ALD systems, where manufacturers of such systems might not be prepared for increased demand if EPA were to finalize a lower charge size, opening the requirement for ALD systems to a larger inventory of refrigeration appliances. Taking into account existing and pending State requirements, the 2023 Technology Transitions Rule, and a likely degree of voluntary adoption of ALD systems, EPA estimates that the requirement will impact approximately 25,000 appliances between 2025 and 2027, and an average of 150 refrigerant-containing appliances per year in subsequent years. The Agency has provided these updated estimates, which differ from those in the proposal (*i.e.,* 50,000 appliances over the year 2025 and 6,500 for subsequent years) because EPA has adjusted the applicability of existing appliances as discussed in section IV.D and in consideration that the 2023 Technology Transitions Rule has been promulgated. The updated estimates also account for new IPR and commercial refrigeration appliances transitioning to refrigerants that do not contain an HFC or substitute for an HFC with a GWP greater than 53. In response to the 2023 Technology Transitions Rule, EPA anticipates that many IPR and commercial refrigeration appliances will transition to alternatives with a GWP less than or equal to 53 and thus those refrigerant-containing appliances will not be subject to the ALD requirements described in this section. EPA has identified 17 manufacturers of ALD systems in the United States. There are 14 manufacturers making direct ALD systems and four manufacturers making indirect ALD systems (one manufacturer was identified as making both types of ALD systems). The majority of installed systems are likely direct ALD systems. EPA estimates that one of the largest manufacturers of direct ALD in the United States makes between 6,500 and 7,000 direct ALD systems per year. For additional information and details on the estimated emissions reductions and costs related to ALD systems, see the Economic Impact and Benefits TSD available in the docket for this action.

Comment: The Agency received several comments concerned with the supply of ALD systems. A few commenters stated there would be serious challenges to obtaining enough ALD systems within the proposal's compliance timeline. Commenters cited inadequate lead times to procure ALD systems and supply chain issues. One commenter claimed that they have been notified by manufacturers and suppliers of the need for extended lead times when ordering new equipment as all parts of the supply chain are facing challenges, such as manufacturing, delivery, and installation. Another commenter stated there are existing methods and technologies for leak detection in outdoor areas that would serve as suitable alternatives to an ALD system, considering the challenges of the proposal's timeline. One commenter claimed that the manufacturing capacity for both direct and indirect ALD systems would likely make industry unable to meet the demand during the one year allotted for existing systems under the proposal. They requested that EPA conduct a more thorough analysis of the capabilities and capacities of ALD system manufacturers to meet the one-year peak demand caused by the proposal. The commenter also requested that EPA consider the feasibility and cost of its proposal based on that information before finalizing.

One commenter, an ALD manufacturer requested that EPA extend the compliance timeline for the installation of ALD to two years based on their understanding of the ALD market and manufacturers' ability to meet demand. The commenter stated that in point detection systems, each point can be considered as an individual system, which is likely why EPA projects a need for 50,000 systems within the first year. However, the commenter claimed, in an aspirated low-level detection setup, a facility may have 16 zones with multiple sampling points in each zone all incorporated into one system. For this reason, the commenter expected market demand for low-level aspirated systems (which the commenter suggested will serve as primary direct detection technology used to meet AIM Act requirements) to be approximately 3,100 units annually. The commenter claims that they are the only ALD manufacturer with existing production volume levels demonstrating the capability of meeting demand of this magnitude.

Lastly, one commenter stated that indirect ALD systems, which they manufacture, can be deployed across thousands of sites more quickly and cost-effectively than solutions that require onsite hardware and site visits, in addition to providing industry more flexibility. The commenter also explained that the largest bottleneck for the implementation of indirect ALD systems are corporate IT security processes, which can take weeks to months. Once the IT approvals are completed, the installation of indirect ALD is prompt. The commenter is confident that they, and other ALD manufacturers identified by EPA, have the ability to meet the large surge in ALD system deployments that would be required under the proposed rule.

Response: In the final rule, EPA has extended the compliance date of new applicable refrigerant-containing appliances to January 1, 2026, has changed the applicability of existing IPR and commercial refrigeration appliances to those installed on or after January 1, 2027, and has extended the compliance date to 2027. For new refrigerant-containing appliances subject to this provision, the Agency has provided an additional year to install an ALD system. Existing refrigerant-containing

[83] EPA describes each type (*i.e.,* direct and indirect) of ALD system later in this section and in detail in the TSD titled *American Innovation and Manufacturing Act of 2020—Subsection (h): Automatic Leak Detection Systems* available in the docket for this final rule.

appliances subject to this provision have more than two years to install an ALD system. With these changes the Agency estimates that approximately 25,000 refrigerant-containing appliances will be required to install and use an ALD system between 2025 and 2027, which will greatly reduce the demand for such systems, limit potential supply chain issues, and further limit demand-related costs increases. EPA has provided owners or operators with additional time to plan, procure, and install an ALD system that meets the requirements described in 40 CFR 84.108, even when considering lead times that may be associated with ordering ALD systems. Additionally, as reflected in comments from ALD manufacturers, the supply of ALD systems is adequate to meet the demand for ALD systems caused by this final rule's provision. The Agency has also provided additional time, as one of the manufacturers requested, to ensure the ALD suppliers can manufacture and supply ALD systems to owners and operators subject to the ALD installation and use requirements. The additional time will also provide owners or operators time to work through corporate IT processes so they can quickly implement indirect ALD systems. For these reasons, the Agency disagrees with one commenter's perspective that ALD manufacturers would not be able to meet the demand for ALD systems. EPA with additional consideration, informed by comments finds the supply of ALD systems to be adequate to meet the compliance dates established in this final rule.

The Agency disagrees with one commenter's claim that there are existing methods and technologies for detecting leaks in outdoor areas which are suitable alternatives to ALD. The commenter did not provide any additional information on what these methods or technologies would include, nor did they specify how such technologies would continuously monitor refrigerant-containing appliances. The Agency is aware that direct ALD systems cannot detect refrigerant outdoors; however, the final rule specifically requires the use of direct ALD systems to monitor leak-prone components within an enclosed space. Furthermore, leak inspections following a successful follow-up verification test are required for all portions of an appliance not monitored by a direct ALD system. Additionally, indirect ALD systems are capable of monitoring the entire refrigerant-containing appliance. For these reasons, EPA disagrees with the commenter's views that there are available techniques or technology that can supplant the need for ALD systems.

Direct refrigerant leak detection systems are fixed hardware that continuously monitor the concentration of refrigerants in the air. Continuous monitoring of a refrigerant-containing appliance can also include direct ALD systems, which directly monitor said appliance through cycling. For direct ALD systems, it is essential that gas sensors be located at all leak-prone components of a refrigeration system; otherwise, some leaks may go undetected. The benefits of direct ALD systems include being able to pinpoint the location and severity of a leak. Direct ALD systems are commissioned to send an "alarm" to maintenance and/or operations staff if the programmed leak level threshold is exceeded. EPA is not establishing a definition of direct ALD systems in this rulemaking and clarifies that any direct ALD system which meets the criteria described in 40 CFR 84.108(f)(1)(2)(3) (*e.g.,* accurately detects a concentration of 10 ppm of vapor) is acceptable to use. Some types of acceptable direct ALD systems include but are not limited to:

- Point gas detection systems;
- Aspirated (or pumped) detection systems.

EPA is requiring owners or operators using direct ALD systems to comply with the provisions to detect and repair refrigerant leaks in appliances. Leak detection sensors must be capable of accurately detecting a concentration level of 10 ppm of the vapor of the specified refrigerant and must alert an owner/operator if refrigerant concentrations exceed 100 ppm. As discussed in the proposal, the technical feasibility of the 100 ppm threshold is well established. This has been the threshold used by CARB and is also the standard in provisions at 40 CFR 82.157(g)(4)(i) for ALD systems that are used as a compliance option in lieu of quarterly or annual leak inspections, as part of the leak repair requirements under CAA section 608. If a leak is detected above the 100 ppm threshold, the owner or operator is required to either perform a leak rate calculation to determine if the leak rate threshold has been exceeded, or alternatively they may preemptively repair the leak before adding refrigerant and calculating the leak rate. In order to calculate the leak rate, EPA refers the reader to section IV.C.3.a of this preamble. EPA is requiring that a leak rate calculation must be performed within 30 days (or 120 days where an industrial process shutdown is necessary) of the alarm where a direct ALD system is used for required equipment. If the calculated leak rate is above the applicable leak rate, as discussed in section IV.C.3.a of this preamble, all of the leak repair requirements in this action (including the repair requirements, inspections, verification tests, and recordkeeping and reporting) will apply.

Alternatively, if the owner or operator chooses to preemptively repair the detected leak, a leak rate calculation must be performed after the preemptive repair; however, the leak rate calculation must still be performed within 30 days (or 120 days where an industrial process shutdown is necessary) of the alarm where a direct ALD system is used for applicable appliances, and accordingly the preemptive repair will also need to occur in that time frame. If the leak rate calculation (performed after the addition of refrigerant pursuant to the follow-up verification test) conducted after the preemptive repair reveals that the appliance had leaked above the applicable leak threshold, the suite of leak repair requirements would apply. The preemptive repair actions can be considered in determining whether the suite of leak repair requirements triggered by the exceedance of the applicable leak threshold have been satisfied, but the owner or operator of the appliance must still ensure that the leaks are repaired according to the definition of repair and that the other requirements in 40 CFR 84.106 (*e.g.,* initial and follow-up verification tests, leak inspections (where applicable), and related recordkeeping) had been met. By allowing a leak detected by an ALD system to be preemptively repaired before the addition of refrigerant and calculation of the leak rate, EPA anticipates this will avoid requiring owners and operators to add refrigerant to a system with a known leak, thereby saving the cost of refrigerant that might subsequently leak prior to the repair, as well as prevent unnecessary emissions of refrigerant. Additionally, preemptive repair of leaks allows owners or operators to have a "head start" on repairing leaks if it is later found that the applicable leak rate threshold has been exceeded when the leak rate calculation is performed.

Comment: EPA received several comments on direct ALD systems. One commenter expressed concern with the proposed language, "for direct ALD systems, it is essential that gas sensors are located at all leak-prone components of a refrigeration system." The commenter views this framing as providing too much flexibility that could lead to unintended outcomes (*i.e.,* ineffective implementation of ALD that

does not lower refrigerant leak rates as desired). The commenter claimed that in California, many facilities mount single-point (passive diffusion) gas detectors on the wall of the mechanical room to comply with CARB regulations. The commenter stated that this method is technically compliant with ALD requirements but is only partially effective at detecting leaks in the mechanical room (due to its distance from most refrigeration components in the mechanical room), and it is completely ineffective at detecting leaks in other parts of the facility outside of the mechanical room. The commenter recommended adding clarifying language to ensure that gas sensors are located within six feet of all leak-prone components of a refrigeration system. The commenter also recommended defining ''leak-prone components of a refrigeration system'' as ''all components of a refrigeration system that contain liquid or gas except for straight runs of piping, inclusive of compressors, evaporators, valves, condensers, headers, receivers, oil separators, oil traps, accumulators, other pressure vessels, etc.''

Another commenter provided information on the applications of different types of direct ALD systems in the HVACR industry. The commenter stated that point detectors serve a primary purpose of enabling compliance with operational safety guidelines for personnel. The commenter asserted that the devices are typically wall-mounted within an occupied space, and sometimes cannot detect a leak due to dilution and air exchange in the greater space which can cause the room to remain below the 500–900 ppm alarm level set for personnel safety. For these reasons, the commenter stated that these detection systems are used for occupant safety and not as a targeted solution for emissions reduction. The commenter also claimed that the proposed rule could be read to preclude aspirated detection systems (*e.g.,* requiring ''continuous'' monitoring and placement of the ''sensor''). Therefore, the commenter proposed modifying the language to replace ''continuously monitor'' with ''actively monitoring.'' Alternatively, the commenter proposed that ''continuously monitor'' could be defined to include devices that actively or directly monitor via cycling. The commenter stated that without one of these edits, the proposed rule would not allow for low-level leak detection equipment that is designed to identify leaks for environmental purposes and requires an established cycle time to sample multiple points, rather than ''continuously monitor'' one specific point. The commenter also suggested that EPA remove ''condenser'' from its examples of what components a direct ALD system should monitor.

Response: EPA acknowledges commenters' concerns with the implementation of direct ALD systems. EPA disagrees that the description of ALD in the preamble provides too much flexibility to owners or operators which will result in ineffective leak detection. The Agency clarifies that direct ALD sensors must be placed on or near leak-prone components (*e.g.,* compressor, evaporator, condenser) or along points of the entire refrigerant circuit if it is entirely enclosed within a building or structure. EPA is not specifying a set distance for gas sensors as the commenter suggests but strongly encourages owners or operators to install gas sensors as close to components as possible. EPA agrees that a single, wall-mounted point detection system in a mechanical room is ineffective at detecting leaks. The Agency reiterates that direct ALD gas sensors will need to be placed on or near leak-prone components so that an appliance is adequately monitored for leaks. EPA is not prescribing a set number of sensors because the refrigerant-containing appliances subject to these requirements are varied in design; however, the Agency clarifies that multiple gas sensors may be required to meet the standards for direct ALD systems. The Agency is not finalizing the commenter's proposed definition of ''leak-prone components of a refrigeration system'' because the Agency has already finalized a definition for component: ''as it relates to a refrigerant-containing appliance, means a part of the refrigerant circuit within an appliance including, but not limited to, compressors, condensers, evaporators, receivers, and all of its connections and subassemblies.'' The leak-prone components where gas sensors are to be placed for direct ALD systems fall under that definition. The Agency agrees that direct ALD systems are not effective for portions of an appliance that are outside of an enclosed space; however, for portions that are located within an enclosed space that have a high chance for leakage EPA finds it appropriate to use direct ALD systems. When a leak is detected and a refrigerant-containing appliance is found to be above the applicable leak rate, an owner or operator is required to inspect all portions of a refrigerant-containing appliance not monitored by an ALD system as discussed in section IV.C.3.d.

In response to one commenter's request to modify the description of direct ALD systems in the rule, EPA has provided additional detail on what types of direct ALD systems are acceptable to use. As discussed in this preamble, the Agency is not establishing a definition of direct ALD systems in this rule; however, EPA clarifies that any direct ALD systems that meet the criteria described in 40 CFR 84.108(f)(1)(2)(3) are acceptable to use for the purposes of leak detection. This includes the use of point detection systems, aspirated detection systems, or any other existing or future direct ALD technologies that can accurately detect a concentration level of 10 ppm of vapor of the specific refrigerant(s) used in an appliance, alerts the owner or operator of when a refrigerant concentration of 100 ppm is reached, and is able to have sensors or intakes that continuously monitor the refrigerant concentrations in air in proximity to leak-prone components. EPA is not changing the term ''continuously monitoring'' however the Agency further clarifies that the term does not preclude the use of direct ALD systems that actively or directly monitor an appliance via zonal cycling. EPA views direct ALD systems that actively monitor portions of a refrigerant-containing appliance as falling under the term ''continuously monitor.'' EPA disagrees with the commenter's claims that point detection systems cannot adequately provide leak detection monitoring for the purposes of leak reduction. While it is true that point detection systems are utilized to comply with occupational safety standards, point detection systems that meet the standards of the final rule are also able to provide adequate leak detection and monitoring for a refrigerant-containing appliance. EPA reiterates that a single, wall-mounted point detection sensor would not provide adequate coverage for an appliance; thus, multiple sensors are needed to cover leak-prone components on an appliance. EPA is also not preventing the use of any direct ALD system that meets the rule's standards because the Agency does not want to further limit the supply of direct ALD systems for owners or operators. The Agency's standards for direct ALD serve the purpose of minimizing the release of refrigerants from appliances while also providing enough flexibility in direct ALD technologies so that owners or operators are able to comply with the rule's ALD provision within the provision's compliance timeframe.

Comment: The Agency received numerous comments on the alarm

threshold for direct ALD systems. The majority of commenters requested EPA that reconsider the proposed 100 ppm threshold and finalize at a lower threshold, either 50 ppm or 10 ppm. One commenter suggested using a <10 ppm threshold to achieve full emissions reduction potential. The commenter cited their report on refrigerant leaks at major supermarket stores demonstrating that many commercial refrigeration leaks are under 10 ppm. Of all the leaks the commenter detected across dozens of stores, less than 5 percent were at a concentration greater than 100 ppm, however, 29 percent ranged from 10-to-100 ppm on the sales floor. The remaining 67 percent of leaks were found to have concentrations less than 10 ppm. Thus, the commenter advocated that EPA use an alarm threshold lower than 10 ppm because small concentrations of refrigerant can be indicative of large leaks within an appliance. Another commenter recommended the alarm threshold be lowered to 10 ppm because of improvements in sensor technology. Finally, one commenter stated the 100 ppm threshold may need to be lowered if EPA is seeking ALD from flanges in a central location. The commenter further suggested that EPA consult with CARB or others to verify the efficacy of the 100 ppm threshold.

One commenter recommended an alarm threshold of 50 ppm for direct ALD systems while maintaining an accurate detection down to 10 ppm of the vapor of the specified refrigerant because small leaks under 100 ppm can result in substantial or complete loss of a refrigeration system over time. The commenter stated that aspirated ALD systems can detect refrigerant vapor at a resolution of 1 ppm and are capable of alerting an owner or operator at an alarm threshold of 10 or 25 ppm. However, the commenter suggested that a 50 ppm alarm threshold would be more appropriate because small leaks could be more readily detected and reduce nuisance alarms that may happen more frequently at lower alarm thresholds. The commenter clarified that nuisance alarms are not the result of noise rather they occur because the aspirated ALD systems can detect leaks that would have been otherwise unknown to an owner or operator prior to installation of the ALD system. The commenter also recommended that EPA not grandfather in any direct ALD systems with alarm levels above 50 ppm as existing direct ALD systems set to 100 ppm are solely meeting safety requirements and are not equipped to minimize release of refrigerant.

Another commenter claimed that long-term ppm limits may not be the best approach to regulate ALD systems because ppm metrics are specific to the sensor and do not directly correlate with the ability to detect a leak rate over a given time. The commenter also stated that they are aware of only one sensor on the market that can detect to a 10 ppm resolution. The commenter provided several examples of existing direct ALD systems and provided suggested specific levels of detection that are appropriate for the type of direct ALD system. For aspirated systems, the commenter suggested a threshold of 10 ppm would be appropriate. For single-zone diffusion (point detection) systems, the commenter suggested a threshold of 200 ppm would be more appropriate. Finally, for appliance-level sensors, primarily used to comply with UL 60335–2–89 for the use of flammable refrigerants, the commenter suggested a minimum threshold of 500 ppm.

Response: EPA is finalizing the alarm threshold for direct ALD systems as proposed. The Agency finds the alarm threshold appropriate to detect leaks from refrigerant-containing appliances faster while preventing false alarms that may occur at lower ppm thresholds. EPA also finds it appropriate to remain consistent with existing alarm criteria under the CAA and State refrigerant management programs. EPA disagrees with one commenter requesting that the Agency not grandfather in existing ALD systems with alarm thresholds above 50 ppm. While a portion of ALD systems currently in use were installed to meet safety standards many other ALD systems were installed by owners or operators for the purposes of leak detection. The Agency is not requiring owners or operators with existing ALD systems that meet the standards in 40 CFR 84.108(f)(1)(2)(3) to install new ALD systems. Owners or operators with existing ALD systems will need to ensure their current ALD systems meet the rule's standards and are providing adequate monitoring of leak-prone components of a refrigerant-containing appliance. Additionally, the Agency does not want to deny existing ALD systems that meet the standards of this rule because doing so could exacerbate potential ALD supply issues and reduce overall compliance with the provision.

EPA acknowledges the information one commenter provided on leaks detected at supermarkets and agrees that small amounts of refrigerant detected can be indicative of larger leaks within a refrigerant-containing appliance. However, EPA does not find the 100 ppm threshold to be incongruous with the discovery of large leaks and the timely repair of refrigerant-containing appliances that are leaking above the applicable leak rate threshold. EPA reiterates that this rule is not requiring the repair of all leaks, rather, this rule is requiring that leaks be repaired to the extent that a refrigerant-containing appliance is leaking below the applicable leak rate threshold. In the context of the appliances subject to this provision the leak repair provisions would begin once the leak rate has exceeded 30 percent for IPR and 20 percent for commercial refrigeration appliances. Setting the threshold to <10 ppm, 25 ppm, 50 ppm, or any other threshold below 100 would in fact alert an owner or operator to the presence of more leaks. However, these discovered leaks would most likely not cause the refrigerant-containing appliance to exceed its applicable leak rate threshold. For example, if EPA were to set the alarm threshold at 10 ppm a pinhole leak on a component near a sensor may alert an owner or operator to a relatively small leak. The ALD provision of this final rule is intended to find larger leaks faster in refrigerant-containing appliances that can emit large amounts of refrigerant from one leak event. When a larger leak is detected by an ALD system, the owner or operator has 30 days to conduct a leak rate calculation or attempt to preemptively repair the leak. Since EPA is not requiring the repair of all leaks, setting the alarm criteria below 100 ppm could create a situation where an alarm is continually alerting an owner or operator of a leak that has been found not to be causing the refrigerant-containing appliance to leak above the applicable threshold. Nuisance or false alarms from ALD systems may decrease compliance with the leak repair provisions of the final rule because owners or operators may begin to ignore alerts for the ALD system. Thus, the 100 ppm alarm threshold reduces the risk of false alarms while ensuring that larger leaks from refrigerant-containing appliances are detected and alert owners or operators to take further action.

Regarding one comment asserting that ppm may not be the best approach to regulate ALD systems because ppm does not correlate to the ability to detect a leak rate, EPA clarifies that the purpose of the ALD provision is to detect leaks sooner, not calculate the leak rate of a refrigerant-containing appliance. As previously discussed in section IV.C.3.a, the final rule's leak rate calculation methodologies are the only appropriate way to calculate a refrigerant-containing

appliance's leak rate. The comment is correct that ppm values of a refrigerant cannot denote how much refrigerant has leaked from a refrigerant-containing appliance; however, it does alert an owner or operator to the presence and potential severity of a leak that must be addressed if the refrigerant-containing appliance is leaking above the applicable leak rate. EPA also disagrees with the commenter's suggestion to base ppm thresholds on the type of direct ALD system, as this may add additional complexity and confusion to the ALD requirements and may diminish compliance with the provision. The Agency reiterates that direct ALD systems that meet the standards in 40 CFR 84.108(f)(1)(2)(3) are acceptable to use. If a direct ALD system cannot meet those standards, then it is not appropriate to use for this rule's ALD requirements.

Comment: The Agency also received comments in opposition to lowering the alarm thresholds for ALD systems. One commenter did not support lowering the alarm thresholds below what EPA proposed because lower thresholds could result in more frequent alarms, potentially leading to operational disruptions and false alarms. Another commenter claimed the proposed conditions of use for ALD systems are arbitrary and capricious because they will cause numerous false alarms. The commenter stated the proposed 100 ppm alarm rate for direct ALD systems and the 50 pound or 10 percent loss of charge for indirect ALD systems are based on ALD system manufacturer recommendations, and not an actual correlation with leak rates. The commenter asserted that it is unreasonable for EPA to adopt regulatory trigger rates, unless EPA has studied a correlation of the alarm levels with a statistical leak rate or probability of leaks. In the commenter's members' experience with ALD systems neither of the alarm thresholds are indicative of leaks. They recommend the Agency not mandate any alarm threshold below 100 ppm and not require mandatory inspection unless alarms recur over a several-day period if the provision is finalized as proposed. One commenter stated the Agency should allow for flexibility requests for unforeseen circumstances. The commenter claimed that EPA would be inundated with nuisance reporting every time an ALD triggers. The commenter suggested that EPA should consider limiting alerts to above a CO_2eq limit if they proceed with the requirement.

Response: The Agency is finalizing the 100 ppm alarm threshold as proposed. EPA disagrees with the comments asserting that the alarm criteria are entirely based on manufacturer specifications, will lead to numerous false alarms, and is unreasonable or arbitrary and capricious. If EPA were to base the alarm criteria of this final rule solely on manufacturer's specification, the final threshold would be much lower. For example, one ALD manufacturer submitted public comments on the proposed rule requesting that the Agency reduce the alarm threshold based on their sensor specifications being capable of detecting refrigerant vapor well below 100 ppm. EPA is finalizing the 100 ppm threshold based on several considerations. For instance, the Agency considered the use of 100 ppm as one of the criteria for a direct ALD system that is used in lieu of quarterly or annual leak inspections under EPA's regulations under section 608 of the CAA, at 40 CFR 82.157(g)(4)(i). The alarm threshold of 100 ppm for ALD systems is also consistent with some States' refrigerant management programs and consideration of information from ANSI/ASHRAE Standard 15–2022 Safety Standards for Refrigeration Systems, among other factors. Based on consideration of this information, as well as comments on the proposed rule, EPA concludes that this threshold is technically feasible and should be familiar to some stakeholders from their experience under other regulatory programs, thus facilitating implementation of these requirements. Further, if the alarm threshold is set too high, the system may miss some leaks that should be addressed and thus would fail to serve its intended purpose. EPA understands that a 100 ppm threshold will minimize the risk of false alarms. However, to the extent that commenters are concerned about false alarms, under the final rule, they may elect to perform a leak rate calculation in response to an alarm, and if that calculation indicates that the equipment is not leaking above the applicable leak rate threshold, no further action will be required.

The Agency also disagrees with the commenter's position that establishing a regulatory trigger rate for the ALD equipment would need to be based on a statistical evaluation of leak rates or the probability of leaks. The Agency clarifies that the ALD requirements serve the purpose of detecting leaks within a refrigerant-containing appliance earlier but are not intended to substitute for the calculation or evaluation of a refrigerant-containing appliance's leak rate. The alarm criteria for direct ALD systems are a specification for such systems to alert owners or operators to a potential leak and are not used to determine a refrigerant-containing appliance's leak rate or the actual severity of a leak, only the presence of a leak. EPA finds the 100 ppm alarm threshold appropriate to serve the purpose of alerting the owner or operator of a leak that may potentially cause a refrigerant-containing appliance to leak above the applicable leak rate threshold. The Agency has provided information in section IV.C.3.a on the leak rate calculation methodologies and when leak rate calculations must be completed. As noted previously, requiring use of ALD systems is consistent with the authority under in subsection (h)(1) to promulgate regulations to control, where appropriate, any practice, process, or activity regarding servicing, repair, or installation of such appliances, which involves a regulated substance or substitute for a regulated substance. When an ALD system provides an alarm in a refrigerant-containing appliance covered by this provision, the owner/operator must perform practices, processes, and/or activities to determine whether the equipment is leaking above the applicable leak-rate threshold and whether service or repair of the refrigerant-containing appliance is needed. The ALD requirements help to minimize releases of regulated substances from equipment and maximize the amounts of refrigerants remaining in equipment for eventual recovery and reclamation.

EPA disagrees with the commenter's experience that the final rule's alarm thresholds are not indicative of leaks and disagrees that ALD system alarms should not be addressed until alarms recur over a period of several days. The final rule allots 30 days (120 in the event of an industrial process shutdown) to calculate the leak rate or attempt to preemptively repair a refrigerant-containing appliance. The leak repair provisions of this final rule apply once the owner or operator has determined the leak rate has exceeded the applicable leak rate threshold. EPA clarifies that the 30-day timeframe for calculating the leak rate begins once the owner or operator has received an alarm from their ALD system. This should provide ample time for an owner or operator to address an alert from an ALD system. The Agency is not claiming that false alarms will never happen; however, as previously mentioned the alarm threshold for ALD systems has been set to mitigate the risk

of false alarms and operational disruptions. If an owner or operator is continually having issues with false alarms from their ALD system, they may consider performing additional calibration or audits to ensure the ALD system is functioning properly.

For similar reasons, EPA disagrees with a separate commenter asserting that more time or flexibility would be needed to address ALD system alerts due to unforeseen circumstances. The commenter incorrectly stated that the owners or operators would need to report alarms from ALD systems to the Agency. EPA clarifies that owners or operators are required to keep records of each date that an ALD alarm is triggered (see 40 CFR 84.108(i)) and are not required to report each ALD system alert to EPA. Additionally, the Agency disagrees with the commenter's suggestion to base the alarm criteria on the exceedance of a CO_2eq thresholds. As previously stated, EPA is finalizing the alarm criteria for ALD systems to help detect leaks early, so that if there are leaks that exceed the leak rate threshold, they can be addressed in a timely fashion. A CO_2eq threshold would not further this purpose. Further, EPA is unaware of any ALD system that can provide accurate alarms based on a CO_2eq threshold as direct systems are detecting the presence of refrigerant vapor in the air and indirect systems are detecting volumes of refrigerant lost via data metrics. The final rule sets an appropriate threshold for owners and operators to address detected leaks in a timely manner and reduce the emissions of refrigerant from refrigerant-containing appliances.

Comment: The Agency received a few comments regarding the preemptive repair provision in the final rule. One commenter stated that setting a requirement for direct ALD systems to alarm at 100 ppm but allowing no action to be taken if the leak rate thresholds are not exceeded, does not further the objective of minimizing release of refrigerant. The commenter also stated that the ALD system will continue to alert an owner or operator of the leak if left unrepaired. The commenter suggested de-coupling the requirement of a leak rate calculation before fixing a leak identified by an ALD system and asserted the rule may be confusing for industry and interpreted as undermining the need for ALD. The commenter further claimed that the best route for leak mitigation is to find and fix all leaks over the applicable threshold and that preemptive repair should be the only recommended solution for leak resolution because the addition of refrigerant to a leaking appliance will result in the loss of the added refrigerant. The commenter asserted that the leak rate calculation can occur after the repair of the leaking appliance.

Another commenter requested clarification on whether an owner or operator needs to calculate a leak rate after preemptive repair is conducted. The commenter stated that the rule appears to offer two compliance options when an ALD system detects a leak; calculate a leak rate and assess whether the appliance is leaking above the applicable leak rate threshold or preemptively repair the leak. The commenter asserted that the requirement of a leak rate calculation seems to be in conflict with EPA's rationale for preemptive repair discussed in the preamble: ''to avoid the need to add refrigerant to an appliance with a known leak (which would otherwise generally be necessary to calculate the leak rate and determine if the applicable leak rate is exceeded).'' The commenter further claimed that the requirement to conduct a leak rate calculation will cause owners or operators to incur additional costs to add refrigerant to a fully functional system for the sole purpose of a leak rate calculation. As currently written, the commenter stated that the provision may be economically burdensome and could add to system downtime. Thus, the commenter suggested the Agency clarify the regulatory text to not require a leak rate calculation if an appliance is preemptively repaired.

Response: EPA acknowledges one commenter's recommendation that the leak rate calculation be decoupled from the final rule's preemptive repair provision for leaks detected by an ALD system and clarifies that these are separate requirements. EPA does not view the leak rate calculation and ALD requirements as incongruous nor does the Agency find that having both requirements will cause confusion as the commenter suggested. Rather, where both apply, they are separate parts of an overall approach to addressing leaks from refrigerant-containing appliances. The required installation and use of ALD systems for IPR and commercial refrigeration at or above 1,500 pounds and the option to preemptively repair a leak in a refrigerant-containing appliance is not intended to replace the need to calculate the leak rate and to repair leaks so a refrigerant-containing appliance is below the applicable leak rate threshold. As noted previously, EPA is not requiring the repair of all leaks; however, the Agency encourages owners or operators to preemptively repair leaks detected by an ALD system. The determination of a leak rate for a leaking refrigerant-containing appliance is vital to ascertain if a refrigerant-containing appliance must be repaired. EPA is providing some flexibility to owners or operators who have been alerted of a leak to either preemptively repair the refrigerant-containing appliance or calculate the leak rate of said appliance to determine if the owner or operator must proceed with the leak repair process. The commenter asserted that preemptive repair should be the only recommended solution for leak resolution; however, if a refrigerant-containing appliance is found to have been leaking above the applicable leak rate threshold after the completion of a preemptive repair, the owner or operator of the refrigerant-containing appliance would still be required to follow through with the rest of the leak repair process (*e.g.,* verification tests, leak inspections, etc.). Furthermore, the Agency reiterates that the final rule is not requiring the repair of all leaks; rather, this final rule requires that leaks be repaired to the extent that they bring the refrigerant-containing appliance below the applicable leak rate threshold. There may be some scenarios where an owner or operator may decide to calculate the leak rate as soon as possible to determine the severity of a leak and determine if further action is needed. Additionally, records of leak alerts from an ALD system that do not push the refrigerant-containing appliance above the leak rate threshold at the time of the alarm will inform an owner operator if their refrigerant-containing appliance is having issues with smaller leaks (*e.g.,* pinhole leaks).

Regarding one commenter's questions on the requirement of a leak rate calculation after the preemptive repair of a refrigerant-containing appliance, the Agency notes that the option to preemptively repair a refrigerant-containing appliance does not remove the necessity to conduct a leak rate calculation. As previously discussed, the option to preemptively repair a refrigerant-containing appliance and the calculation of a refrigerant-containing appliance's leak rate are separate parts of an overall approach to addressing leaks from refrigerant-containing appliances. The commenter is correct that the Agency is providing two compliance pathways when a leak is detected by an ALD system; however, EPA clarifies that its rationale for the preemptive repair provision is intended to reduce the emissions of refrigerant from an appliance that is known to be leaking. EPA encourages owners and operators to preemptively repair a

refrigerant-containing appliance for this reason but is not requiring an owner or operator to do so. In both compliance scenarios the owner or operator will need to conduct a leak rate calculation to determine if the refrigerant-containing appliance was leaking above the applicable leak rate which requires the owner or operator to conduct the rest of the leak repair process, even if the leak(s) were preemptively repaired. Preemptive repair gives owners or operators a ''head start'' to the leak repair process and is not a replacement for the leak rate calculation of the refrigerant-containing appliance. The Agency disagrees with the framing of the commenter's claims on additional economic or operational burden to owners and operators associated with the calculation of the leak rate after preemptive repair. A refrigerant-containing appliance may be considered ''fully functional'' after preemptive repair, but a leak rate calculation is still required in order to determine if the appliance at the time of the ALD system alarm was leaking above the applicable threshold. If the refrigerant-containing appliance was leaking above the threshold, it is required that the preemptive repair be verified and inspected per the leak repair provisions of this final rule to ensure the repair holds. EPA reiterates that the preemptive repair of an appliance is not a substitute for the calculation of a leak rate. Additionally, similar costs would be incurred if the owner or operator decided to not preemptively repair a refrigerant-containing appliance and just calculated the leak rate of said appliance. If that appliance was then found to be leaking above the applicable leak rate the full suite of the leak repair provision would apply. Thus, the Agency disagrees with the commenter's suggestion to remove the leak rate calculation if a refrigerant-containing appliance is preemptively repaired.

EPA is requiring owners or operators using an indirect ALD system to comply with the provisions to detect and repair leaks in appliances. The indirect ALD system must be calibrated to provide an alarm when the system has provided measurements that indicate that 50 pounds of refrigerant or 10 percent of the full charge of refrigerant, whichever is less, has leaked. EPA acknowledges that commercial refrigeration and IPR appliances would exceed the alarm threshold if 50 pounds of refrigerant had leaked from an appliance. Therefore, owners and operators subject to the ALD installation and use requirements in this final rule that are using indirect ALD systems would be alerted when a leak surpassed 50 pounds of refrigerant. EPA understands that owners and operators not subject to the ALD installation and use requirements that are utilizing an indirect ALD system would receive an alert at 10 percent of full charge lost depending on the charge size of their refrigerant-containing appliance. For example, an appliance with a charge size of 200 pounds would alarm when 20 pounds of refrigerant is lost because the appliance has leaked 10 percent of its full charge. Once that alarm threshold has been surpassed, EPA is requiring the owner or operator to perform a leak rate calculation, or alternatively they may preemptively repair the leak before adding refrigerant and calculating the leak rate. The same requirements, as described elsewhere in this section, where an owner or operator chooses to perform preemptive leak repair when using a direct ALD system apply in the scenario where preemptive leak repair is performed when using an indirect ALD system. Similarly, EPA is requiring that a leak rate calculation be performed within 30 days (or 120 days where an industrial process shutdown is necessary) of the alarm where an indirect ALD system is used for refrigerant-containing appliances subject to this provision. If the calculated leak rate is above the applicable leak trigger rate (as discussed in section IV.C.3.a of this preamble), all of the leak repair requirements in this action (including the repair requirements, inspections, verification tests and recordkeeping and reporting) would then apply.

As described in the proposal, indirect ALD systems rely on data analytics to detect leaks rather than the direct detection of refrigerant gas. Indirect ALD systems monitor the operation of a refrigerant-based system to infer whether a leak is present. This method is typically conducted using existing sensors and hardware that are already located on site, and it relies on algorithms to evaluate existing conditions, such as liquid levels, temperatures, and ambient conditions to indicate whether a leak is occurring. EPA understands that indirect systems can be calibrated to provide an alarm when a specified predicted refrigerant leak rate has occurred. The Agency is not establishing a definition of indirect ALD systems in this rulemaking and clarifies that any indirect ALD system that meets the criteria described in 40 CFR 84.108(g) is acceptable to use. Additionally, EPA is requiring that indirect ALD systems monitor at least two ''measurements'' to determine whether a refrigerant-containing appliance is leaking above the final rule's alarm criteria. Some examples of appropriate measurements include but are not limited to temperature, liquid levels, pressure, and flow rate. Multiple measurements are required to ensure that an indirect ALD system is operating as intended and providing owners or operators with accurate data on the condition of their refrigerant-containing appliance.

The Agency clarifies that a 10 percent loss of full charge does not directly correspond to the leak rate threshold of 20 percent for commercial refrigeration and 30 percent for IPR. The 10 percent of total charge lost when an indirect ALD system alarms may equate to less than or greater than an annualized leak rate of 20 or 30 percent depending on the timeframe over which the leak occurred (see section IV.C.3.a for more information on calculating the annualized leak rate). In any event, this difference is reasonable because the primary purpose of the ALD system is to allow the owner or operator to obtain knowledge of the leak earlier (*e.g.,* before operations are impacted) and to facilitate earlier repair, whether through preemptive repair before the leak rate threshold is exceeded or through required repairs after the leak rate threshold is exceeded. The technical feasibility of the ''50 pounds of refrigerant or 10 percent of the full charge, whichever is less'' standard is well established. This has been the threshold used by both CARB and is also the standard in provisions at 40 CFR 82.157(g)(4)(ii) for ALD systems that are used in lieu of quarterly or annual leak inspections, as part of the leak repair requirements under CAA section 608.

Comment: The Agency received mixed comments on the inclusion of indirect ALD in the proposal. One commenter supported the inclusion of indirect ALD systems in the proposed rule. Another commenter asserted that EPA should not allow indirect ALD systems as an alternative to direct ALD systems because indirect ALD systems are newer technologies that are unproven to satisfy the objectives of this rule. The commenter suggested that the final rule could include indirect detection as a helpful supplement to direct detection systems but should not replace or be permitted as an alternative to direct ALD. The commenter also stated that no indirect detection system currently complies with safety standards for occupied spaces and that an additional layer of direct ALD is required to comply with ASHRAE and other guidance that governs personnel safety. If indirect ALD systems are going

to be considered as an alternative or substitute of direct detection, the commenter asserted that more prescriptive requirements need to be determined to equate the action levels with direct ALD systems and that EPA must provide clearer description of indirect systems.

Similarly, another commenter recommended that EPA require indirect ALD systems to use multiple data points to determine whether a leak is present. The commenter stated that many ALD systems registered under their refrigerant management program are indirect ALD systems that only use room temperature to determine whether a leak is present or not; however, newer indirect ALD systems generally use multiple data points working in tandem, such as temperature, pressure, liquid levels, etc., to help identify potential leaks. The commenter further stated that indirect ALD systems utilizing only a single data point (*e.g.,* temperature) are reactive to conditions that have occurred after a potential leak as opposed to indicating a leak when it first occurs, thus indirect ALD systems using multiple data points are more accurate at identifying and repairing leaks.

Response: EPA acknowledges comments in support of the final rule's indirect ALD requirements. As described in 40 CFR 84.108(g) indirect ALD systems must alarm when ''measurements'' indicate a loss of 50 pounds of refrigerant or 10 percent of full charge, whichever is less. EPA clarifies that it intends indirect ALD systems to use multiple parameters in order to make determinations of refrigerant loss. EPA agrees that a single parameter being measured by an indirect ALD system may not be sufficient to accurately detect leaks and may be subject to external forces that may result in a false alarm or no alarm at all. Thus, the Agency is clarifying that at least two measurements be used by an indirect ALD system to determine if an appliance has leaked above the alarm threshold. Some measurements include but are not limited to temperature, pressure, and flow rate. This clarification of indirect ALD systems using multiple parameters to accurately determine the presence and severity of a leak above the alarm threshold should ease commenters' concerns on the viability of indirect ALD systems.

EPA disagrees with one commenter's assertion that indirect ALD systems are not an alternative to direct ALD systems. The Agency agrees that indirect ALD can be used in tandem with direct ALD for additional benefits. However, EPA finds any indirect ALD system that meets the standards outlined in 40 CFR 84.108(g) as acceptable to use because the indirect ALD systems are capable of alerting owners or operators of leaks just as direct systems can. The Agency disagrees with the framing of the commenters statement that indirect ALD systems are not able to comply with ASHRAE standards for personnel safety. In the context of this final rule, the ALD requirements are designed to alert owners or operators of a leak earlier so that repairs of leaks above the applicable threshold can be made faster and thus, minimize the release of refrigerants from refrigerant-containing appliances. The Agency did not propose and is not finalizing that ALD be used to ensure technician safety. As previously discussed in the preamble of this section, EPA is aware of ASHRAE safety standards for A2L refrigerants and UL Standard 60335 2–40 requirements for the use of leak detectors for certain appliances.

Additionally, EPA finds that there are strengths and weaknesses of both leak detection technologies. For example, direct ALD can accurately detect the location of leaks if positioned well on or near an appliance; however, direct ALD cannot function well outdoors where ambient conditions can diminish the presence of refrigerant. Indirect ALD can monitor an entire appliance, including portions of an appliance that may be located behind walls or outdoors, and use metrics to determine whether a leak has occurred. As the commenter stated, one issue with indirect ALD is its inability to definitively detect the precise location of a leak. EPA is not prescribing which ALD system owners or operators must use; instead, the Agency is requiring the use of an ALD system that meets the standards of this rulemaking and detect leaks early to minimize the release of refrigerants from equipment. Further, EPA understands that one type of ALD may suit the needs of an owner or operator better than the other. Allowing flexible options for ALD will facilitate compliance with this provision and ensure there is an adequate supply of ALD systems for owners or operators. If EPA were to limit the use of ALD to one system over the other, owners or operators may have difficulty installing ALD systems within the timeframe required by the final rule.

Comment: The Agency received a few comments concerning the alarm threshold for indirect ALD systems. One commenter stated that indirect ALD systems have the capability to detect a leak with as little as one percent of full charge lost when data is reliable and available. However, to minimize the risk of false alarms at lower percentages (*e.g.,* ≤ five percent), the commenter recommends that EPA finalize the proposed alarm criteria for indirect ALD systems. The commenter stated that the proposed alarm criteria would allow their manufactured systems to send leak alarm notifications with high confidence and reduce the risk of false positives, which degrade customer confidence in leak alarm notifications.

Alternatively, one commenter stated that they were unaware of any standard or industry accepted procedure to verify the indirect ALD system is operating in a manner to detect 50 pounds or 10 percent of full charge. The commenter asserted that it was unclear how this requirement would be consistently applied and enforced, and that the Agency should better define the process of verification. Another commenter asserted that the alarm criteria for indirect systems are not equivalent to the alarm criteria for direct systems. The commenter claimed that indirect systems are not equipped to quantify the severity of the leak or pinpoint its precise location because indirect systems rely on data analytics and have not been developed for the purpose of retaining refrigerant in an appliance.

Response: EPA is finalizing the alarm criteria for indirect ALD systems as proposed. EPA acknowledges comments in support of the provision. EPA disagrees that there are no standards or industry accepted procedures to ensure indirect ALD systems are properly verified and calibrated to perform the function of leak detection. The alarm criteria for indirect ALD systems have been utilized by CARB since 2011. The alarm criteria under CARB's refrigerant management program for both direct and indirect ALD systems were based on ANSI/ASHRAE Standard 15–2001, Safety Standards for Refrigeration Systems. These alarm criteria were adopted by EPA in the 2016 Section 608 Rule for owners or operators who sought to implement ALD as a compliance option in lieu of quarterly or annual leak inspections. For these reasons, EPA finds it appropriate to adopt the same alarm criteria in this final rule. Additionally, the Agency clarifies that an owner or operator would need to follow the manufacturer's specifications for an indirect ALD system to ensure it is properly calibrated to the appliance and that it is monitoring and performing the function of alerting an owner or operator when a leak is detected above the lesser of 50 pounds or 10 percent of full charge. The final rule requires that indirect ALD systems be audited and calibrated annually and requires records

to be kept detailing these annual audits and calibrations. Regarding the commenter's question to how this provision would be enforced, EPA notes that the recordkeeping for ALD systems in 40 CFR 84.108(i) would be used to determine if an owner or operator has been non-compliant and whether further enforcement action is necessary.

EPA also disagrees that the alarm criteria for indirect and direct ALD systems are not equivalent because indirect and direct ALD systems are using different parameters to determine the existence of a leak; thus, the alarm criteria for both technologies will never be one-to-one. EPA clarifies that direct ALD cannot determine the severity of a leak based on ppm detection alone either, as the detection of ppm vapor of a refrigerant is not exactly correlative with how much refrigerant has leaked from an appliance. The only way to confirm the severity of a leak is via a leak rate calculation, which is required within 30 days of an alarm for both direct and indirect systems. As discussed previously, direct and indirect ALD systems have strengths and weaknesses; however, indirect ALD systems, inability to determine the exact location of a leak does not preclude the technology from serving the purpose of alerting an owner or operator of a leak. Additionally, in the context of the appliances that are subject to the ALD requirements in the final rule (*i.e.,* IPR and commercial appliances with a charge size of 1,500 pounds or more), 50 pounds of refrigerant loss is a relatively small proportion of the appliance's full charge. Direct ALD systems that alarm at 100 ppm of detected refrigerant concentrations may have leaked a comparable amount of refrigerant before alerting an owner or operator.

2. Recordkeeping and Reporting

EPA is finalizing, as proposed, specific reporting and recordkeeping requirements for ALD systems in this action. Where ALD systems are required, EPA is requiring that owners or operators maintain records regarding the annual calibration or audit of the system. EPA is also requiring that records be maintained each time an ALD system triggers an alert, whether that be based on the applicable ppm threshold for a direct ALD system or the indicated loss of refrigerant measured in an indirect ALD system. When an ALD system alerts the owner or operator of a leak, EPA is requiring that the owner or operator maintain a record of the date of the ALD system alert and the location of the leak. EPA is also establishing recordkeeping requirements in the case where an owner or operator chooses to use an ALD system, where not required, as a compliance option in lieu of periodic inspections for an appliance that has exceeded an applicable leak rate. The recordkeeping requirements related to when a leak rate calculation must be conducted are described in section IV.C.3.g of this action. As discussed in section II.B, EPA's authority to require recordkeeping and reporting under the AIM Act is also supported by section 114 of the CAA, which applies to the AIM Act and rules promulgated under it as provided in subsection (k)(1)(C) of the AIM Act.

EPA is requiring that these records related to ALD systems, where required, be maintained for three years. Where ALD systems are being voluntarily used (*i.e.,* appliances with a full charge below 1,500 pounds or using a substitute for HFCs with a GWP of 53 or below), no recordkeeping is required. However, if an appliance using an ALD system is found to be leaking above the applicable leak rate and the owner or operator chooses to use the ALD system in lieu of periodic inspections, they are required to follow all requirements associated with this compliance option, including annual audits or calibration and all necessary recordkeeping requirements. The recordkeeping requirements in this action do not change any recordkeeping requirements where an owner or operator chooses to use an ALD system per 40 CFR 82.157(g)(4) for appliances containing ODS refrigerants.

Comment: EPA received a few comments on the reporting and recordkeeping requirements for its ALD provisions. One commenter supported the reduced recordkeeping requirements for facilities that opt into ALD in lieu of quarterly or annual inspections. The same commenter was supportive of recordkeeping requirements that demonstrate facility owners are performing the necessary calibration and maintenance of ALD systems. However, the commenter stated that the prescriptive installation and calibration may work against manufacturer specifications, which should be followed to achieve optimal results. Another commenter supported EPA's proposed approach of not requiring ALD system alerts to be reported to the Agency and would oppose including any such reporting requirement in the final rule. If the Agency has the need to review these records, the commenter said they can always be requested from a facility rather than imposing an additional administrative burden on owners or operators and on EPA by requiring a report of every ALD alert. Lastly, one commenter reinforced the need for digital recordkeeping and recommended that digital records directly tied to the detection system be encouraged where possible.

Response: EPA is finalizing recordkeeping requirements for ALD systems as proposed. EPA acknowledges one commenter's request that ALD alerts not be reported to the Agency. Records of ALD alerts are required, but EPA did not propose and is not finalizing that ALD alarms be reported to the Agency. The Agency agrees with one commenter's emphasis on digital recordkeeping and agrees that, where appropriate, digital recordkeeping is appropriate for filing the information required under this provision. EPA clarifies that recordkeeping in a paper format is still acceptable as long as records are kept in the manner defined in 40 CFR 84.108(i). The Agency disagrees with one commenter's claim that annual calibration of ALD systems may go against manufacturers specifications. EPA is unaware of any manufacturer specifications that would make annual calibration and verification that an ALD system is functioning properly impossible or non-optimal. While owners or operators should rely on manufacturer specifications as it relates to the installation and operation of equipment, the Agency does not view the annual calibration and audits of ALD systems as out of sync with manufacturer specifications. ALD installations and their subsequent use should largely align with manufacturer specifications, but owners or operators must ensure that all leak-prone components are monitored by an ALD system.

E. How is EPA establishing requirements for recovered and reclaimed HFCs?

EPA is finalizing requirements for recovered and reclaimed HFCs with modifications after consideration of the comments and information received on the proposed rule. EPA is requiring reclaimed refrigerants that contain HFCs to contain no more than 15 percent, by weight, virgin HFCs. The reclamation standard will apply as of January 1, 2026, and the provision includes certain recordkeeping, labeling, and certification requirements. EPA is also finalizing requirements for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors. EPA also proposed to require reclaimed HFCs in the servicing and/or repair of refrigerant-containing equipment in the stand-alone refrigeration subsector, but is not finalizing that requirement in this

action. EPA is delaying the compliance date for these finalized requirements by one year from January 1, 2028, to January 1, 2029. EPA is also establishing a discrete reporting requirement, as described in section IV.E.2. Lastly, at this time, EPA is not finalizing requirements for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs.

As described in the proposed rule, subsection (h) provides EPA authority to, where appropriate, establish regulations to control such practices, processes, or activities that are intended to increase reclamation of HFCs, as well as substitutes for HFCs, that are used as refrigerants. EPA understands this delegation of authority to give the Agency flexibility to promulgate regulations that could include those that are designed to increase market demand for reclaimed HFCs with a goal of increasing the amount of HFCs that are reclaimed, which would further serve the purpose of maximizing the reclamation of regulated substances. Accordingly, EPA is establishing requirements for what constitutes reclaimed HFCs and for the servicing and/or repair of certain refrigerant-containing equipment to be done with reclaimed HFCs. In this rulemaking, EPA is not establishing requirements for reclaimed HFC substitutes; however, the Agency interprets the authority under subsection (h) to include establishing such regulations. Consistent with the proposal, EPA determined it would be prudent to focus the requirements finalized in this action on HFCs, given that the HFC consumption and production phasedown will create scarcity for virgin HFCs and such demand can partly be addressed by increased use of reclaimed HFCs where possible.

EPA published a Notice of Data Availability (NODA) on October 17, 2022 (87 FR 62843), to alert stakeholders of information regarding the U.S. HFC reclamation market, available through a draft report, *Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices.*[84] EPA solicited stakeholder feedback and held a public stakeholder meeting shortly after the NODA was published on November 9, 2022.[85] EPA received comments [86] from various entities in response to the published NODA and from the stakeholder meeting, including comments from reclaimers, industry organizations, environmental non-government organizations, OEMs, and a private citizen. EPA held an additional public stakeholder meeting on March 16, 2023, and a webinar through EPA's GreenChill Partnership Program on April 12, 2023, and heard many similar comments to those received on the NODA.[87] [88] Interested parties may view the draft report, the materials for the public meetings, and the comments the Agency received in response to the NODA in the docket for this action.

EPA is providing a final version of the report, titled *Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices,* that is also available in the docket of this action. EPA has incorporated information provided from commenters to this rulemaking (as further discussed and responded to in sections IV.E.1 and IV.E.2), including oral comments provided at the public hearing on November 2, 2023.

1. Reclamation Standard

EPA is finalizing, as proposed, that HFC refrigerant sold as reclaimed can contain no more than 15 percent virgin HFC refrigerant, by weight. EPA is clarifying in this final rule and in the regulatory text at 40 CFR 84.112(a) that this requirement begins on January 1, 2026, as intended to match the compliance date of the relevant labeling and recordkeeping requirements described in this section. This applies only to the HFC portion of reclaimed refrigerants, in the case of refrigerant blends with HFCs and a non-HFC component (*e.g.,* an HFC/HFO blend). EPA is also prohibiting, as proposed, the sale, distribution, or transfer to a new owner, or the offer for sale, distribution, or transfer to a new owner, of any regulated substance used as a refrigerant in stationary refrigerant-containing equipment (*i.e.,* not an MVAC or an MVAC-like appliance) [89] consisting in whole or in part of recovered regulated substances. This prohibition does not apply where the recovered regulated substances are reclaimed by an EPA-certified reclaimer (as described in 40 CFR 82.164) and have been reclaimed consistent with the definition of reclaim in 40 CFR 84.3 (including to the required purity standard and with the appropriate verification),[90] or if the recovered regulated substance is being sold, distributed, or transferred to a new owner, or offered for sale, distribution, or transfer to a new owner solely for the purposes of being reclaimed or destroyed. Further, for clarity, EPA notes that recovered refrigerant that is used by the same owner is regulated under 40 CFR 82.154(d). This rulemaking does not alter those requirements and does not prevent an equipment owner or operator from using refrigerant recovered from a piece of equipment they own to be used in that same piece of equipment or another piece of equipment they own.

EPA is also establishing labeling and recordkeeping requirements, as proposed, and prohibiting the sale, identification, or reporting of refrigerant as being reclaimed if the HFC component of the resulting refrigerant contains more than 15 percent, by weight, of virgin HFC. EPA proposed and is requiring that certified reclaimers affix this label to reclaimed HFCs being sold or distributed or offered for sale or distribution beginning January 1, 2026. The label is required to include the specifications as described in the regulatory text at 40 CFR 84.112(d). Additionally, EPA proposed and is requiring that certified reclaimers create and maintain a record related to the reclaimed HFCs filled in containers. EPA is requiring such records be generated beginning January 1, 2026, be maintained by reclaimers for three years, and include the following information:

- The name, address, contact person, email address, and phone number of the certified reclaimer;
- The date the container was filled with reclaimed HFC(s);
- The amount and name of the HFC(s) in the container;

[84] Draft Report—Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices, October 2022. Available at: *https://www.epa.gov/system/files/documents/2022-10/Draft_HFC-Reclamation-Report_10-13-22%20sxf%20v3.pdf.*

[85] Stakeholder meeting for input on an upcoming regulatory action under subsection (h) of the AIM Act, November 2022. Available at: *https://www.epa.gov/system/files/documents/2022-11/AIM%20Act%20Stakeholder%20Meeting_HFC%20Management_11-9-2022.pdf.*

[86] Comments submitted to response of NODA published on October 17, 2022 (87 FR 62843) are available in the docket for this rulemaking at *https://www.regulations.gov.*

[87] Stakeholder meeting on HFC reclamation under the AIM Act, March 2023. Available at: *https://www.epa.gov/system/files/documents/2023-04/HFC%20Management_Reclaimer%20Stakeholder%20Mtg_Final%203-15-23.pdf.*

[88] Webinar—Subsection (h) Under the American Innovation and Manufacturing Act, April 2023. Available at: *https://www.epa.gov/greenchill/webinar-subsection-h-under-american-innovation-and-manufacturing-act.*

[89] EPA further discusses MVAC servicing and recovered and reprocessed HFC refrigerants in section IV.I.

[90] EPA has made a few modifications to the regulatory text as finalized at section 84.104(a) to ensure consistency with the definition of reclaim in 40 CFR 84.3, in accordance with the intent for this provision.

- Certification that the contents of the container are from a batch where the amount of virgin HFCs does not exceed 15 percent, by weight, of the total HFCs;
- The unique serial number of the container(s) filled from the batch;
- Identification of the batch of reclaimed HFCs used to fill the container(s); and
- The percentage, by weight, of virgin HFC(s) in the batch used to fill the container(s).

Consistent with the proposal, EPA is not requiring that each individual container or cylinder be rationed out to meet the allowable limit of 15 percent, by weight, of virgin HFCs. Rather, EPA is requiring, at the batch level, that the reclaimed HFCs not exceed 15 percent, by weight, of virgin HFCs. As discussed in section IV.A.2, EPA proposed a definition of ''virgin regulated substances'' that would have included the heels removed from containers. However, EPA is finalizing a modification of that definition to mean ''*any regulated substance that has not had any bona fide use in equipment*'' but omitting the portion of the proposed definition that would have included heels. As a part of implementing this provision, EPA is also establishing that HFCs that are removed from the heels of containers do not contribute towards the limit of 15 percent, by weight, of virgin HFCs. EPA recognizes the value in the removed heels and, while the heels may be regulated substances that have not had bona fide use in refrigerant-containing equipment, EPA understands from comments on the proposed rule that some reclaimers may still reprocess removed heels to ensure the material will meet the applicable purity standards. EPA understands that, in the distribution chain, heels may be recovered into a common recovery cylinder along with refrigerant that has been recovered after a bona fide use in equipment.

EPA is finalizing these requirements to implement the statutory requirement in subsection (h)(2)(B) of the AIM Act, which provides that any regulated substance used as a refrigerant that is recovered shall be reclaimed before being sold or transferred to a new owner, except where the recovered regulated substance is sold or transferred to a new owner solely for the purposes of being reclaimed or destroyed. This will be particularly relevant to the refrigerant-containing equipment for which EPA is establishing requirements the servicing and/or repair be done with reclaimed HFCs, as described in section IV.E.2. These provisions are also intended to support the implementation of the statutory provision for stationary refrigerant-containing equipment in the context of other requirements established in this rulemaking, including by outlining more specific requirements for the reclamation that would need to occur before sale or any of the other listed activities for such regulated substances, as well as incorporating the statutory exception for situations where such recovered regulated substances are sold or transferred solely for the purposes of being reclaimed or destroyed. EPA further discusses its approach for recovered regulated substances used as refrigerants in MVAC equipment in section IV.I.

EPA is finalizing a standard for the amount of virgin HFC refrigerant that can be included in any reclaimed refrigerant containing HFCs to support consistent implementation of the requirements for the servicing and/or repair of certain equipment with reclaimed HFCs in addition to establishing consistency on the amount of virgin HFCs in reclaimed refrigerant when that refrigerant is sold, identified, or reported as reclaimed for use in the installation, servicing, and/or repair of refrigerant-containing equipment. These requirements are being established as part of implementing subsection (h)(1) of the AIM Act, as these provisions control practices, processes, or activities regarding the installation, servicing, or repair of equipment and involve a regulated substance or the reclaiming of a regulated substance used as a refrigerant. As the HFC phasedown progresses, the overall quantity of virgin HFCs available, including to facilitate reclamation through blending or rebalancing, will decrease. In addition, the Agency considers that limiting the extent to which the purity standard for reclamation is achieved through combining with virgin refrigerant (besides what the Agency understands to be the necessary rebalancing, particularly of certain blends) in this rulemaking supports the purpose of maximizing reclamation, and additionally bolsters the available supply of reclaimed HFCs in the market.

Comment: Several commenters supported the 15 percent limit, by weight, on virgin refrigerant in reclaimed material. One commenter deferred to EPA regarding the amount of virgin material necessary to meet purity standards. Another commenter stated that it would be counterproductive to allow the use of more than 15 percent of virgin material given the proposed rule's rationale to boost the U.S. reclamation industry. Another commenter stated that the 15 percent threshold allows sufficient flexibility to reclaim refrigerants and further stated that higher virgin-to-reclaimed content ratios could constitute ''greenwashing'' thereby deceiving consumers on the environmental benefit of using a reclaimed refrigerant. One commenter, although generally supportive of the 15 percent virgin content limit, questioned whether the 15 percent limit applied to single-component refrigerants where blending is not necessary. Likewise, another commenter expressed support for the proposed limit of no more than 15 percent newly produced HFCs in multi-component refrigerant blends to qualify as a reclaimed blend, but also recommended that EPA require single component refrigerants to use 100 percent reclaimed material. One commenter supported the proposed 15 percent virgin HFC limit, claiming it is reasonable and ''ensures the continued existence of smaller reclaimers who must sometimes bulk up reclaimed gases to meet AHRI 700 purity standards.'' The commenter further recommended ramping down the acceptable proportion of virgin gas over time to incentivize better reclamation technology.

Several commenters supported a lower limit on the virgin content in reclaimed refrigerant. One of the commenters suggested the use of a virgin content limit for reclaimed material but encouraged EPA to tighten the requirement to send a clear message to the industry to invest in advanced reclamation technologies. The commenter noted that the 15 percent limit used by CARB was based on a term-limited program for a single State, while EPA's proposed use requirements for reclaimed HFCs will apply nationally and are not term limited; thus, the requirements would send clear signals for investment in advanced reclamation technology. Another commenter similarly supported a maximum HFC virgin content in reclaimed HFCs, noting the importance of preventing large quantities of virgin HFCs from being blended with smaller reclaimed HFC quantities and considered reclaimed (which would not create a sustainable supply of reclaimed materials as the supply of virgin HFCs continues to decrease, and would disincentivize investment in fractional distillation capacity), and encouraged EPA to further tighten this requirement because the 15 percent limit was established in the California context. The commenter further stated that a stronger limit may be feasible on a nationwide basis while also supporting the smaller reclaimers in continuing to

expand and develop their capacity for advanced reclamation of HFCs. Another commenter expressed concern that setting an allowance (*e.g.,* 15 percent) for inclusion of newly produced refrigerant to be incorporated into reclaimed refrigerant is not a credible structure and will result in greenwashing claims, arguing that only recovered refrigerant should be considered reclaimed. The commenter further claimed that setting such a limit for newly produced refrigerant could thwart the goal to maximize reclamation and narrow uses away from clever solutions like a ''service gas'' with an increasing percentage of reclaimed refrigerant as more reclaimed refrigerant becomes available over time.

Another commenter stated that they supported the definition of reclaimed refrigerant as containing no more than 15 percent virgin material but would also support a lower or much lower limit because only a few larger reclaimers who were also importers, blenders, and distributors received substantial HFC allowances. The commenter further stated that many reclaimers received small or no allowances, and that allowances provided to reclaimers are being reduced as reclamation expectations are being raised. The commenter concluded that that most reclaimers would not be able to access 15 percent virgin material for a blend even if they wanted or needed to. The commenter further noted they did not support the concept that reclaimed refrigerant could be any percentage and treated as a blended component in a larger lot of refrigerants, arguing that this concept is not reflective of how reclaimed refrigerant is produced today and opens the door to non-reclaimers to find creative solutions to dilute the value of reclaimed refrigerant.

Response: EPA acknowledges these commenters' support and requests for potentially tightening the limit for virgin HFCs in reclaimed HFC refrigerant. The Agency understands that a portion of virgin HFCs is often necessary for rebalancing particular refrigerant multi-component blends, and, in contrast, EPA understands that single-component HFCs that are reclaimed would not require additional high-purity (*e.g.,* virgin) HFCs for the purposes of rebalancing. EPA also understands that different reclaimers deploy different practices (*e.g.,* not all reclaimers use fractional distillation), and may see different needs for using the maximum allowable percentage of 15 percent, by weight virgin HFCs. For example, some reclaimers may have capabilities and technologies to reclaim particular multi-component blends from difficult-to-separate mixed recovered refrigerants and may not need to use the full 15 percent limit, by weight, of virgin HFCs. Other reclaimers may have limited access to these technologies and might routinely meet the maximum allowable amount of virgin HFCs in reclaimed HFC refrigerants they process and sell. With these considerations, the Agency views the 15 percent limit, by weight, on virgin HFCs as appropriate and disagrees that it is appropriate at this time to establish a lower limit on virgin HFCs or that reclaimed HFC refrigerants may only constitute recovered materials. However, the Agency notes that it may revisit this requirement in the future, for example by evaluating whether a reclamation standard with a higher or lower percentage, by weight, for the maximum amount of virgin HFCs is appropriate at that time.

Further, the Agency does not agree with the need to and is not establishing different standards for different reclaimers based on technology used to achieve the required purity standards for reclaimed refrigerants. EPA is establishing a single reclamation standard to ensure that reclaimed HFC refrigerants sold or marketed contain a consistent amount of virgin HFCs (*i.e.,* no more than 15 percent, by weight). Establishing a varying standard might produce unintended effects for reclaimed HFC refrigerants placed on the market such that reclaimed HFCs of varying amounts of virgin content may be valued differently by purchasers. The reclamation standard of 15 percent virgin HFCs, by weight, allows for some virgin HFCs to be used to rebalance HFC blends, if needed. Further, this consistent standard will also avoid scenarios where HFC refrigerants are sold or marketed as reclaimed but may consist of only a small amount of recovered and reclaimed material and the balance being virgin HFCs. Such a case could lead to confusion for refrigerant purchasers, including those in subsectors subject to the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs. This final rule, as described in this section, also includes provisions for recordkeeping and labeling based on this standard, which are intended to support identification of those HFC refrigerants that meet the reclamation standard, including by those purchasing reclaimed HFC refrigerant, by those servicing and/or repairing refrigerant-containing equipment, and by EPA. Moreover, for these reasons, EPA concludes that establishing a consistent limit of 15 percent, by weight, of virgin HFCs in reclaimed HFC refrigerant is appropriate, in consideration of the purpose identified in subsection (h)(1) the AIM Act to maximize reclamation.

EPA acknowledges that the program established by CARB was term-limited, with applicability only for a single State. The Agency agrees that applying a reclamation standard on a broader scope (*i.e.,* nationally) may provide signals to spur additional reclamation and advancements in technology. However, unlike the CARB program, EPA is not applying the reclamation standard to only a single refrigerant blend in this rulemaking, noting that the standard applies to the HFC portion of refrigerants that contain HFCs (whether neat or in a blend), nor is the Agency establishing a term-limited program for the reclamation standard. As noted earlier in this response, the reclamation standard established in this rule is based on consideration of the purpose identified in subsection (h)(1) to maximize reclamation. Thus, the Agency is not tightening the standard, at this time, for reasons described earlier in this response and since the reclamation standard in this final rule applies more broadly than that of the CARB program.

EPA acknowledges concerns related to ''greenwashing'' and improperly claiming benefits associated with reclaimed refrigerants. The Agency's view is that the established limit of 15 percent, by weight, for virgin HFCs in reclaimed HFC refrigerants is appropriate at this time, as explained earlier in this response. EPA considers the required label and other requirements established in this rule as one means of countering false claims of benefits related to refrigerants that contain a higher proportion than permitted of virgin HFCs. To the extent that one of the commenters claims that allowing any virgin HFCs in reclaimed refrigerant would lead to greenwashing claims, EPA disagrees. The requirements established in this rule provided clarity about the extent to which reclaimed refrigerant can contain virgin HFCs and are designed to ensure that all reclaimed refrigerant meets the same minimum standards. The Agency will monitor the marketing of refrigerants and may consider revising or adding to these requirements in the future if warranted.

EPA acknowledges that some, but not all, reclaimers are allowance holders. EPA does not view a lack of allowances as a barrier to reclamation. To the extent that reclaimers use high-purity refrigerants in their reclamation process

(*e.g.,* for rebalancing blends), even if they do not have allowances, they could purchase virgin HFCs in the domestic market or other high purity (*e.g.,* previously reclaimed) refrigerant, which may or may not go through some degree of reprocessing, until the final product meets the purity specifications to be considered reclaimed. Further, reclaimers may obtain allowances through transfers from existing allowance holders, and the transferred allowances can then be used to import HFCs. EPA is unclear as to how non-reclaimers would dilute the reclamation market based on the comment; however, EPA responds to concerns with the potential for a non-reclaimer to market refrigerant as reclaimed by noting that the requirements finalized in this action, including the labeling and recordkeeping requirements, apply to any refrigerant that is sold as reclaimed.

Comment: One commenter supported the 15 percent virgin allowance for reclamation but sought clarification on the calculation of this value. The commenter was unclear how the calculation for reclaimed refrigerant would be performed, especially when the reclaimed material includes non-HFC refrigerants. The commenter was uncertain whether the non-HFC substances would be included in the weight of the reclaimed refrigerant batch and recommended not including non-HFC components towards the minimum 85 percent by weight of reclaimed HFCs. The commenter additionally suggested a tolerance limit for the measurement or calculation of the 15 percent or 85 percent.

Response: Consistent with the proposal, EPA is clarifying that in the case of reclamation of a refrigerant blend that contains an HFC and a non-HFC component (*e.g.,* an HFO) that is being reclaimed, the 15 percent limit for virgin materials only applies to the HFC component of the blend. When calculating the amount of virgin HFCs that will be allowed, the 15 percent limit, by weight, applies to the weight of the HFC component(s), not the total weight of the reclaimed refrigerant.[91] EPA further clarifies that the 15 percent limit on virgin HFCs does not apply per HFC where a reclaimed refrigerant blend contains more than one HFC component. Rather, the 15 percent limit on virgin HFCs should be calculated as 15 percent of the weight of the total HFC components in the blend.[92] EPA notes that subsection (h)(1) of the AIM Act provides authority to promulgate regulations to control, where appropriate, practices, processes, or activities related to the servicing, repair, disposal, or installation of equipment that involves the reclaiming of a substitute for a regulated substance used as a refrigerant. EPA interprets this provision to provide it authority that includes establishing requirements for how practices, processes, or activities related to the servicing, repair, disposal, or installation of equipment are conducted, including requiring those practices, processes, or activities be done with reclaimed HFCs or reclaimed HFC substitutes. However, at this time, the Agency is not establishing a requirement for the non-HFC component of a blend to be reclaimed and thus is not establishing a standard limiting the amount of virgin material for reclaimed substitutes for HFCs. While EPA acknowledges that there is some degree of random and systematic error associated with measurement devices, EPA is not implementing a tolerance range for this provision at this time and does not agree that one is necessary. It is EPA's view that the institution of a 15 percent limit, by weight, on virgin HFCs allows reclaimers a range of compliance options, as they can use any amount of virgin HFCs between 0 and 15 percent, by weight, and still meet the standard. Implementing a tolerance range in addition to the range that is already inherent in the standard would lessen the standard's effectiveness in serving the purposes identified in subsection (h), including maximizing reclamation.

Comment: One commenter supported the 15 percent, by weight, virgin allowance for reclamation but proposed basing the reclaimed content on CO_2 equivalency values to allow the market under the Allowances and Technology Transitions programs to better move to low-GWP refrigerants in a cost-effective and environmentally positive manner. The commenter recommended allowing the destruction or repurposing of one refrigerant to be credited with a carbon allowance and to allow an equivalent quantity of another refrigerant to be placed on the market as reclaimed, minus a 10 percent offset for a net reduction in CO_2 equivalents, to create a new market outlet for high-GWP substances and ensure that leaks are minimized. The commenter provided examples where a smaller mass of high-GWP substances could be reclaimed and a larger mass of low-GWP substances placed on the market as reclaimed material by relying on the substances' CO_2 equivalents.

The commenter stated that HFC–32 and HFC–152a use in blends is vital to the survivability of the industry as it phases down HFCs under the Allocation rulemakings and goes through the transition required by the 2023 Technology Transitions Rule. The commenter stated that if EPA adopts a strict weight (mass) basis, industry will face an extreme burden sourcing HFC–32 and HFC–152a. The commenter noted that all formulations of viable heat pump solutions are based on some content of HFC–32, and that the vast majority of HFC–32 in the current marketplace is in the form of R–410A. The commenter stated that it is correct to assume that material will be used to service that market and HFC–32 will not become available for use in R–454B service or in commercial refrigeration service/initial fill. Further, the commenter mentioned that the fact that HFC–32 and HFC–125 make an azeotrope at a composition not too far from R–410A makes the separation of HFC–32 from HFC–125 non-trivial to recover the HFC–32 via distillation. The commenter stated that the viable solution is to slightly reconstitute and return ''certified reclaimed material'' to the market for service of existing equipment aging out of the marketplace.

Response: EPA did not propose and is not establishing an offset or GWP-based program as the commenter suggests. The Agency recognizes that the 2023 Technology Transitions Rule uses GWP thresholds and that the Agency issues allowances based on exchange values. However, for the purposes of establishing an ER&R program, and more specifically for establishing provisions for the upper limit on virgin HFCs used in reclaimed HFCs, the Agency does not agree with the asserted need for an offset or GWP-based approach. In establishing this and other requirements related to reclaimed refrigerants in this rulemaking, the Agency seeks to require actions that would help meet the purposes described in subsection (h)(1) of the AIM Act, including maximizing the reclamation of HFCs. Thus, the destruction or

[91] As an illustrative example, if a refrigerant blend is composed of 50 percent HFC and 50 percent non-HFC and one is seeking to reclaim 100 pounds of this refrigerant, the 15 percent limit on virgin HFCs would apply only to the weight of the HFC portion, or 7.5 pounds (*i.e.,* 15 percent of 50 pounds).

[92] As an additional illustrative example, suppose 100 pounds of a refrigerant to be reclaimed contains 20 percent of HFC A, 30 percent of HFC B, and 50 percent of a non-HFC component. The 15 percent limit on virgin HFCs would apply only to the weight of the sum of the HFC components. In this example, the total weight of HFCs is 50 pounds and the allowable weight of virgin HFCs would be 7.5 pounds (*i.e.,* 15 percent of 50 pounds). The limit on virgin HFCs may be made up of a combination of weights of virgin HFC A and HFC B that total 7.5 pounds (*e.g.,* 7.5 pounds of virgin HFC A and zero pounds of virgin HFC B; 3.5 pounds of virgin HFC A and 4 pounds of virgin HFC B; etc.).

repurposing without reclaiming of any HFCs, including high-GWP HFCs that can be properly reclaimed, would be counter to this goal. Further, other provisions of the AIM Act prescribe a phasedown, and not a phaseout for regulated substances. Even after the phasedown reaches its final step, virgin HFCs will continue to be produced and consumed. Any destruction-based program to provide offsets or credits would need to fully assess and address additionality.[93] While such programs and considerations are beyond the scope of this rulemaking, EPA is uncertain whether additionality could be addressed in these types of programs. The Agency also does not agree with a GWP-weighting approach for virgin HFCs allowed in reclaimed HFCs. The Agency proposed and is finalizing a requirement that is based on percentage, by weight. The Agency understands that for servicing equipment, it is important to maintain adequate supply of the same refrigerants used in that equipment when it was initially charged. So, unlike the 2023 Technology Transitions Rule facilitating transition to next-generation technologies through sector-based restrictions on HFCs, this rule concerns the goals of maximizing reclamation and minimizing releases from equipment. Availability of refrigerants of all types, increasingly from reclamation, is central to meeting the goals of this rule, and an approach that applies to all HFCs would continue to promote reclamation. An approach that is GWP-based may have a counter effect of promoting only reclamation of certain higher-GWP HFC refrigerants. Further, such a GWP-weighted approach would likely require additional compliance measures such as labeling or recordkeeping and reporting to ensure a specified overall CO_2 equivalency is met.

The Agency recognizes the use of HFC–32 and HFC–152a neat and in blends. The Agency further understands that as the market evolves, the sourcing of HFCs to be reclaimed may require separating HFCs and then using those separated HFCs in new blends. EPA is aware that a number of reclaimers have invested in and currently operate advanced reclamation technologies to effectively reclaim refrigerants, including separating and reclaiming HFC–32 from R–410A. For additional discussion on supply of reclaimed HFCs, please refer to comments and responses in section IV.E.2.

[93] Additionality is the criterion used to demonstrate that the activity or project generating offsets or credits would not have happened anyway (*e.g.,* if it were required by regulation).

Comment: Another commenter, as part of their suggestion that EPA replace the reclaim mandates for initial fill and servicing with a requirement that refrigerant supplied for servicing include a specified percentage of reclaimed material on a CO_2e basis, proposed that this requirement should be met on a net basis, allowing for certified reclaimed refrigerant to be blended with virgin refrigerant in any ratio so long as the final ratio of material placed into the market in every reporting year meets the ratio as determined by the Administrator. The commenter asserted that this flexible requirement would allow a supplier to provide 100 percent virgin R–410A, but 100 percent reclaimed R–404A, HFC–134a, or other refrigerant types, so long as the net CO_2e is met.

Response: The Agency does not agree with the commenters suggestion to base the 15 percent on an annual basis. The reclamation standard established in this final rule is such that reclaimed refrigerants are available for the servicing and/or repair of refrigerant-containing equipment in certain subsectors, and it is not applied at the supplier level. Reclaimers must meet the reclamation standard of no more than 15 percent virgin HFCs, by weight, on a batch basis and certify that the reclaimed refrigerant does not exceed the limit. Basing the reclamation standard on an annual basis may create scenarios in which materials exceeding the reclamation standard of no more than 15 percent virgin HFCs, by weight, is sold or marketed as reclaimed material. This would be counter effective to the goal of maximizing reclamation and could potentially put those servicing and/or repairing refrigerant-containing equipment in the covered subsectors in non-compliance. The Agency further discusses elsewhere in this section that it is applying the requirement on a batch basis.

Comment: EPA received many comments that opposed the 15 percent, by weight, limit for virgin HFCs in reclaimed HFC refrigerants. Two commenters stated the requirement should be removed. One such commenter opposed any cap on virgin HFC refrigerants and specifically opposed the 15 percent blanket cap which they stated was arbitrary and capricious. The commenter claimed that similar provisions at a State level (*i.e.,* CARB regulations) were established after industry input for R–410A, EPA did not solicit detailed technical input before the 15 percent proposal, and CARB's 15 percent limit cannot be assumed to correlate for other multicomponent HFC blends. The commenter claimed that the limit could cause certain equipment to be prematurely obsolete if it uses HFCs for which the 15 percent limit is unworkable, and that EPA did not consider technical factors in tandem with the HFC phasedown. The commenter stated that EPA must demonstrate that the limit is uniformly technically achievable based on limitations of reclaimers and across the spectrum of HFC blends currently in the market and will result in increased reclamation beyond regulatory and market factors already identified by EPA to meet its mandate under subsection (h). The commenter claimed that small reclaimers cannot separate mixed or out-of-ratio refrigerants, resulting in the destruction of many refrigerants. The commenter stated that greater reclamation could be realized if small reclaimers could use virgin refrigerant at their discretion to meet purity standards while not yielding more reclaimed refrigerant than they received. The commenter disagreed that a virgin HFC limit was necessary given the decreasing pool of virgin HFC.

Another commenter claimed that the 15 percent virgin material limit for reclaimed material effectively removed blending as an option for creating certified refrigerants from mixed HFCs. The commenter stated that fractional distillation is not realistic for small businesses due to its cost and time required, and that new technologies to address mixed HFCs are still nascent. The commenter contended that reclaimers receive many mixed HFCs and that the 15 percent limit would remove any benefit of blending.

One commenter stated that the 15 percent, by weight, virgin HFC requirement would require an unattainable amount of material in 2028. The commenter provided an example using R–410A, based the consumption of HFC–32 as provided on EPA's HFC Data Hub [94] and certain assumptions, including that consumption corresponds to demand and usage and the 50% of HFC–32 consumption is used to produce virgin R–410A. The commenter estimated that only four percent of the total demand for R–410A could have been met in 2022 based on the 15 percent virgin requirement. The commenter also stated that, frequently, a small amount of reclaimed mixed refrigerant is added to virgin refrigerant to blend out mixed gas, not the other way around. Using a very high reclaim to virgin ratio as the standard for reclaimed gas will reduce

[94] HFC Data Hub, available: *https://www.epa.gov/climate-hfcs-reduction/hfc-data-hub.*

reclaimer's ability to process more mixed gas into salable product.

Response: EPA acknowledges these comments related to the limit on virgin HFCs in reclaimed HFC refrigerants. The Agency concludes that such a limit is necessary for helping to achieve the purpose identified in subsection (h) of the AIM Act to maximize the reclamation of HFCs because without such a limit, refrigerant could be marketed as reclaimed even if it contained minimal recovered HFCs. Reclaim and reclamation are defined in subsection (b)(9) of the AIM Act to mean the reprocessing of a recovered HFC to a particular purity standard and the verification of the purity of that HFC using at a minimum a specified analytical methodology. Establishing a limit on virgin HFCs helps to ensure that reclaimed HFCs effectively make use of recovered HFCs and also helps promote more recovery of used HFCs from equipment that can then be reclaimed. This is an important part of maximizing reclamation of HFCs because those recovered HFCs are a key component of reclaimed refrigerants. Accordingly, EPA disagrees with the assertion that greater reclamation would result from an approach that allows reclaimers to use as much virgin HFC as they wished in producing reclaimed HFCs.

EPA also disagrees that a decreasing pool of virgin HFCs would cause the reclamation standard to be unnecessary. Although the phasedown mandated by the AIM Act will lead to transition to alternatives as well as likely increased use of reclaimed HFCs, that is not equal to fulfilling Congress's direction in subsection (h) of the AIM Act, namely maximizing the reclamation of HFCs that the requirements in this final rule are designed to achieve. Further, the provisions finalized in this rule provide consistency for what is considered reclaimed HFCs, and the accompanying labeling provisions provide transparency for those purchasing reclaimed HFCs. For example, it would not provide assurances to those who service, repair, or install refrigerant-containing equipment that HFC refrigerants sold or marketed as reclaimed meet consistent standards, including with respect to the virgin content. Further, EPA explains in this response how the reclamation standard supports the purposes under subsection (h), notably, maximizing the reclamation of HFCs. Reclaimed HFCs currently are used in equipment and will continue to be a significant source of HFCs to support equipment that use HFCs, including in particular, the servicing and/or repair of existing equipment so that these pieces of equipment can reach their full useful life. However, EPA does not expect that such use on a voluntary basis would maximize the reclamation of HFCs, as Congress instructed. For example, EPA's multi-decade experience with regulations under CAA section 608 where there are no similar requirements for reclaimed ODS or ODS substitutes provides insight related to reclamation. Reclamation trends of ODS has been fairly steady, only driven by market demand, with no requirements for a limit of virgin material or requirements for servicing or repairing equipment with reclaimed ODS. In earlier years of reported HFC reclamation (*i.e.,* 2017–2021), a similar steady trend can be observed. While there was no statutory direction to maximize reclamation of ODS under CAA section 608, as there is under subsection(h) of the AIM Act, the flat trend of ODS reclamation could represent that increasing trend could have been observed with additional regulatory drivers. As EPA discusses in other responses in IV.E.2, reclamation of HFCs has more recently (*i.e.,* in 2022 and 2023) seen an increasing trend. As noted at the start of this paragraph, while the phasedown of HFCs under the AIM Act may have an effect on the increasing trend, notably during years near a phasedown step, EPA has determined that that alone is not enough to maximize reclamation, as the Agency was instructed to do by Congress. The provisions in this rule are necessary to ensure this trend continues and reclamation of HFCs is maximized. Further, as EPA has noted, the production and consumption of HFCs are being phased down, not phased out. As such, there will still likely be demand for HFCs after the phasedown concludes, and reclaimed HFCs will play in important part of meeting that demand. Thus, EPA concludes that it is appropriate to establish reclamation requirements in this rule.

EPA does not agree with the comments asserting that the Agency must demonstrate that the limit is uniformly technically achievable for current reclaimers and across the spectrum of HFC blends in the market and will result in increased reclamation beyond regulatory and market factors to meet its mandate under subsection (h). From information provided in comments to the NODA and based on EPA's understanding, HFC reclamation can be complex and require advanced separation technologies. EPA understands that reclaimers have access to varying degrees of these technologies for the reclamation of HFC refrigerants. Based on information provided to the Agency in comments to the NODA, in public meetings, and in comments for this rulemaking, EPA is aware that reclaimers are currently using technologies that can meet the provisions of this rulemaking. The statutory text of subsection (h) does not include requirements for uniform technical achievability, and EPA interprets the references in subsection (h)(1) to maximizing reclamation to include authority to establish provisions that require reclaimers to go beyond their current practices to achieve that goal, when such requirements are otherwise consistent with the direction in subsection (h)(1). EPA also interprets subsection (h)(1) as authorizing regulations that help ensure that the reclamation that may be anticipated based on other regulatory or market factors, such as a decreasing pool of virgin HFCs, actually occurs and meets a uniform standard. In EPA's view, such regulations can be part of the overall effort to maximize reclamation, consistent with subsection (h)(1).

The Agency disagrees with the commenter stating that the reclamation standard would lead to certain types of equipment becoming prematurely obsolete. Reclaimed refrigerant is required to meet applicable purity standards, which must also be verified by specified analytic methodology. Further, under the Allocation Framework Rule, virgin refrigerant is required to meet the same purity standards. Thus, reclaimed refrigerants would serve the same function in refrigerant-containing equipment as virgin refrigerant. As such, EPA disagrees the reclamation standard would be unworkable and cause premature obsolescence for equipment as it relates to using reclaimed refrigerants meeting the reclamation standard. Related to the availability of reclaimed refrigerants for the servicing and/or repair of certain refrigerant-containing equipment, EPA discusses supply and estimated demand in section IV.E.2. Further, EPA is not finalizing, at this time, either the proposed requirement for servicing and/or repair with reclaimed HFCs in a fourth subsector or the proposed requirement for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs (see comment responses in section IV.E.2 for additional discussion).

EPA also disagrees that the reclamation standard placing a limit on the amount of virgin HFCs would cause additional destruction by small reclaimers. While some small reclaimers may choose to destroy recovered

material they receive, others may identify the value in the recovered material and send it to a larger reclaimer with more sophisticated technology to separate the components. EPA understands that this is a current practice and, ultimately, the fate of the recovered materials in this scenario may be a business decision by the small reclaimers.

Further, establishing such a standard helps to ensure that reclaimed HFCs are a consistent product on the market. The Agency understands that reclaimers have varying types of reclamation technology; however, the Agency does not agree that reclamation primarily by blending is an effective method to achieve the purposes identified in subsection (h) and in particular maximizing reclamation. As noted by some comments, such a practice can result in refrigerants that contain relatively small amounts of reclaimed material being sold or marketed as reclaimed. Moreover, the Agency is not precluding the practice of blending itself, such that the 15 percent limit, by weight, of virgin HFCs is not exceeded. Highly pure reclaimed HFCs and up to 15 percent virgin HFCs can be used for such purposes. The definition of reclaim/reclamation in subsection (b)(9) of the AIM Act states that reclamation involves the ''reprocessing of a recovered regulated substance.'' Consistent with this definition, recovered regulated substances must undergo some degree of reprocessing to be reclaimed, and the Agency does not view achieving the required purity standards by solely blending with virgin HFCs to constitute reprocessing the recovered materials. Thus, blending with virgin HFCs would be a practice performed together with other measures to reprocess recovered HFCs to achieve the required purity standards. Furthermore, placing a limit on the maximum allowable virgin HFCs in reclaimed HFCs ensures a consistent understanding among the regulated community of what reclaimed HFCs are.

EPA acknowledges that it referenced the Refrigerant Recovery, Reclaim, and Reuse Requirements (CARB Program) or R4 Program while proposing a limit on virgin HFCs in reclaimed HFCs, as well as other applicable information. As the commenters state, the limit on virgin HFCs established by CARB for California were developed after consultation with industry. EPA proposed, requested comment on, and is finalizing a broader program that was informed, in part, by the experience in California. EPA recognizes that the R4 Program in California was more limited in scope to focus on reclaimed R–410A, and that industry input on the State program was largely focused on this. The Agency is finalizing the requirement for a limit on virgin HFCs for all reclaimed refrigerants that contain HFCs. This requirement is being established to drive and promote reclamation as consistent with the purpose in subsection (h)(1) of maximizing of reclamation of HFCs. In response to the comment that EPA did not solicit technical input before the 15 percent proposal, EPA notes that the Agency solicited comment on establishing different percentages for a limit on virgin HFCs (*e.g.,* if a lower percentage could be used). Commenters had the opportunity to provide technical information during the public comment period for this rulemaking, many commenters did so, and EPA has considered those comments in finalizing this requirement.

EPA disagrees with the comment stating that the 15 percent limit would require an unattainable amount of material in 2028 and disagrees with the commenter's provided assessment for the estimated amount of reclaimed R–410A at four percent relative to the commenter's estimated demand in 2022. EPA understands that the commenter made certain assumptions for the demand of R–410A based on the consumption of HFC–32; however, the Agency states that the term ''consumption'' is a specifically defined term under the AIM Act and the Allocation Framework Rule that captures production plus imports minus exports. Thus, the commenter's assumption consumption corresponds to domestic demand and usage does not appear to account for exports. However, it is not clear how that might affect the analysis, given the commenter also acknowledged that HFC–32 may be used in other applications assumed that demand of R–410A was based on half of the total consumption of HFC–32. Furthermore, EPA does not find this analysis relevant to the provisions in this final rule, as the analysis is based on comparing reclamation totals to estimated demand of R–410A in 2022. EPA is finalizing requirements for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors beginning on January 1, 2029. In a comment response in section IV.E.2, EPA discusses estimated demand of reclaimed HFCs for servicing and/or repair of refrigerant-containing equipment in these subsectors and provides additional details in the Economic Impact and Benefits TSD in the docket of this rulemaking. As noted in that comment response, EPA anticipates that the supply of reclaimed HFCs will increase in the coming years and be sufficient to meet the demand associated with the provisions in this rule. EPA estimates the total demand of R–410A for servicing and/or repair of refrigerant-containing equipment at approximately 134,000 pounds (61,000 kg). This is well below the total R–410A reclaimed in 2022, even when considering the reclamation standard to limit the amount of virgin HFCs in reclaimed refrigerants at 15 percent, by weight. As explained in other comment responses in section IV.E.2, EPA anticipates that recovered or reclaimed R–410A can be a useful source for reclaimed HFC–32 and HFC–125 (*i.e.,* the components that make up the blend R–410A).

Comment: Another commenter stated that EPA failed to consider areas where the proposed regulations duplicate existing regulations or less burdensome and costly alternatives, claimed that there are less costly and less burdensome regulatory alternatives for EPA to continue to implement Congressional directives under the AIM Act, and claimed that EPA's cited objectives in the proposed rule have already been achieved by an aggressive HFC phasedown schedule. The commenter stated that EPA estimates the overall compliance costs of the proposed rule to be well in excess of $3 billion, and stated that under the Unfunded Mandates Reform Act (UMRA), before promulgating any rule that may result in expenditures, in the aggregate, of $100 million or more, an agency must ''identify and consider a reasonable number of regulatory alternatives and from those alternatives select the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule.'' The commenter further asserted that EPA has not shown that it considered the current market dynamics, let alone any less burdensome and less costly alternatives, before proposing onerous new requirements applicable to reclaimers, and claimed that EPA's proposed rule goes too far and is not tailored to achieve the goals of subsection (h) in the least costly, most cost-effective, or least burdensome manner, as required under UMRA. The commenter also claimed that EPA has not presented any evidence to show that proposed reporting and recordkeeping requirements will increase opportunities for reclamation beyond what will occur from market dynamics.

The commenter stated that in short, if there is a less burdensome alternative that will accomplish EPA's stated objectives, then the Agency is obligated to consider and adopt it unless another alternative exists that is even less costly or burdensome. The commenter further stated that it was not apparent that the type of scenarios they listed or the associated costs were considered by EPA in developing its cost estimates, and that EPA failed to consider how existing regulations, policies and practices, and alternative approaches to address concerns regarding mischaracterization of reclaimed HFC refrigerants would be more effective, less costly, and less burdensome. The commenter provides one such approach that the Agency should use existing reporting requirements under the AIM Act and clarify that a reclaimer cannot yield more reclaimed refrigerant than the quantity of recovered refrigerant input. The commenter also asserted that the proposed 15 percent limit on virgin HFC refrigerants in reclaimed refrigerants is a sharp departure from past interpretations and will result in significant costs without adequate technical or legal justification, and that many small reclaimers do not have capabilities to separate mixed or out-of-ratio refrigerants, meaning that the 15 percent limit will be difficult or impossible to meet for some small reclaimers. The commenter stated that the result could be that many used refrigerants will be destroyed, which the commenter stated would undermine the AIM Act's directive to maximize reclamation and will also result in significantly greater costs to the regulated community which EPA has not considered. The commenter asserted that the proposed cap will impose unjustified costs and burdens on all reclaimers and their customers that do not appear to have been fully considered by EPA. The commenter claimed that for EPA to meet its legal burden in proposing this rule, it must demonstrate that its proposed limit is uniformly technically achievable; that adoption of this limit will result in increased reclamation beyond the regulatory and market factors EPA has already identified, to meet its mandate under subsection (h); and that EPA must also demonstrate under UMRA that this is the least costly, most cost-effective, and least burdensome option. The commenter further claimed that EPA provided no evidence that container tracking, marking, and certification will serve to maximize reclamation, minimize releases, or protect technicians and consumers beyond what is accomplished by existing requirements, nor has the Agency demonstrated that its proposed requirements are the least costly and burdensome options. The commenter stated that small business grant programs, which could help, have yet to be established and are subject to appropriations availability.

Response: EPA disagrees with these commenters' assertions as described in this response. EPA extensively considered the legal and technical basis of formulating a reclamation standard provision under subsection (h), as described in the proposed rule and in this final action. As previously stated, EPA consulted with stakeholders before the notice of proposed rulemaking (NPRM), through the opportunities for public comment on the NPRM, and anticipates continuing engagement after the rule is finalized. Notably, in October 2021, EPA released a draft report ''Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices,'' accompanying a NODA (87 FR 62843, October 17, 2022). EPA solicited stakeholder feedback and held a public stakeholder meeting shortly after the NODA was published on November 9, 2022. EPA received 11 comments in response to the NODA as detailed above. EPA does not agree that the 15 percent limit on virgin HFCs is not technically achievable and discusses in the prior response in this section and in section IV.E.2 the technical capabilities of reclaimers and the available technologies that are current in use. EPA also discusses in another response in this section that the Agency disagrees that the reclamation standard would lead to additional destruction by small reclaimers. Further, EPA received comments to the NODA stating the use of these technologies (*e.g.,* fractional distillation) is feasible, and the Agency is aware of reclaimers expanding capacity of these technologies to process increased volumes of reclaimed HFCs. Thus, there are technologies available (*e.g.,* fractional distillation) that can be used and are currently in use to reclaim HFCs while meeting the 15 percent, by weight, limit on virgin HFCs in reclaimed material. With these considerations, EPA determined that a 15 percent limit on virgin material is technically feasible and received comments agreeing with that conclusion. As described in the prior comment response, EPA received multiple comments disagreeing with the reclamation standard of no more than 15 percent virgin HFCs, by weight, and the Agency discusses these comments in that response.

EPA considered alternatives to the reclamation standard, including soliciting comment in the NPRM on a lower limit and on not requiring a limit at all. After considering these alternatives and the comments on the reclamation standard, EPA concludes that the 15 percent limit is a technically appropriate way to ensure a consistent understanding among the regulated community of reclaimed material. Further, from both a technical and a legal perspective, the Agency concludes that the reclamation standard is an important part of ensuring that the reclaimed HFCs that are used to comply with the requirements for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs are in fact chiefly constituted of reclaimed material, thus helping to ensure that these requirements serve the intended objective of maximizing reclamation, consistent with the purposes identified in subsection (h)(1). To the extent the comment suggests that EPA must provide evidence that the reclaim requirements will substantially increase opportunities for reclamation beyond what would occur from market dynamics or that they be uniformly technically achievable, EPA does not agree that subsection (h) requires such evidence as a prerequisite to regulation, for the reasons discussed in the prior response to comment. In response to the commenters' statement that the 15 percent limit on virgin HFCs differs from past interpretations, EPA notes that this is the first rulemaking under subsection (h) of the AIM Act and as such, there are no past interpretations under this authority by which to compare. Thus, the Agency is addressing questions related to the implementation and interpretation of this provision for this first time in this rulemaking. Further, title VI of the CAA does not contain the same or similar language regarding reclamation as is included in subsection (h) of the AIM Act, and thus past interpretations under the CAA were based on different statutory text and context. In response to the comment regarding reporting and recordkeeping requirements, EPA explains that there are recordkeeping and labeling requirements finalized in this rule to support compliance with the requirements for reclaimed HFCs established in this rule. For example, some of the recordkeeping and labeling requirements help to ensure that refrigerant that is sold or marketed as reclaimed meets the reclamation standard. This in turn helps ensure that

a person servicing and/or repairing refrigerant-containing equipment in certain RACHP subsectors can identify that the reclaimed HFCs meet the reclamation standard, and that they can service and/or repair refrigerant-containing equipment with reclaimed HFCs that meet the reclamation standard. As such, these recordkeeping and labeling requirements support provisions to help to maximize reclamation but are not designed to independently increase opportunities for reclamation.

Further, in response to the comment regarding the duplication of existing regulations, EPA responds that it disagrees that the requirements for labeling and recordkeeping duplicate the existing regulations cited by the commenter. The commenter alludes to regulations under 40 CFR part 84 subpart A, which require certain recordkeeping and reporting for information from reclaimers on the quantities of recovered refrigerant they receive, quantities they reclaim, and the quantity of waste that is disposed of. The regulations in 40 CFR part 84 subpart A also require recordkeeping for results of analyses, by batch, that verify that purity standards for reclaimed HFCs are met, specified contact information from whom they receive recovered material, and the quantity of material, by HFC, that they receive. The recordkeeping and labeling provisions finalized in this rule do not duplicate these requirements because they include different requirements than those included in the subpart A rules and are designed to provide information related to the requirements of this final rule. For example, this final rule establishes recordkeeping and labeling requirements for reclaimers to retain information and provide a label that certifies that the reclaimed HFCs they sell or distribute, or offer for sale or distribution, meet the reclamation standard and contain no more than 15 percent virgin HFCs, by weight.

In response to the alternative approach offered by one of the commenters to address the potential mischaracterization of virgin HFCs sold as reclaimed HFCs, EPA notes that this approach would not fully capture the information needed to support compliance with this rule. This approach would provide EPA with a snapshot to assess the amount of reclaimed HFCs compared to the amount reclaimers receive as recovered HFCs each year. However, as EPA understands, reclaimers may not reclaim all the HFCs they receive in a single reporting year.[95] They may reserve recovered HFCs until a time that is more opportune to reclaim the HFCs, based for example, on market considerations or other factors. EPA notes that the commenter is correct that current reporting requirements under 40 CFR part 84 subpart A provides useful data, including inventory reports submitted annually. EPA could use this information to assess reported totals of HFC reclamation as compared to the total HFCs received by reclaimers and the amount of waste reported. The labeling requirements in this rule are designed so that the regulated entities servicing or repairing refrigerant-containing equipment in the covered subsectors can confirm they are doing so with reclaimed HFCs. There may be cases where the person (*i.e.,* a certified technician) servicing a piece of refrigerant-containing equipment in the covered RACHP subsectors is not the same person that is purchasing the reclaimed HFCs that will be required to service that piece of equipment. Thus, the labeling requirements in this rule provide certainty to the technicians that they are in compliance with the reclaim requirements when they service and/or repair refrigerant-containing equipment in the covered subsectors.

With respect to UMRA, the Agency's proposed action complied with the requirements under UMRA that applied at proposal. Because the requirements finalized in this rule are narrower in some respects than those evaluated in the proposal, as well as the estimated impacts of the 2023 Technology Transitions Rule in reducing the amount of projected future stocks of refrigerant-containing appliances using an HFC or HFC substitute with a GWP greater than 53, the estimated compliance costs of the final rule are significantly lower than what the proposed rule's estimated compliance costs were. As noted elsewhere in this preamble, this final 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. Thus, the requirements related to the adoption of the least costly, most cost-effective, or least burdensome alternative that meets the objectives of the rule under UMRA do not apply to this final action. To the extent that the comments on the proposed requirements for recordkeeping and reporting and other comments on EPA not evaluating scenarios and associated costs estimates are related to the proposed container tracking requirements, EPA responds that those provisions are not being finalized in this rule, and the Agency is not addressing such comments.

Given the importance of the 15 percent cap in helping to achieve the regulatory objective of maximizing reclamation, EPA does not agree that any costs or burdens that may be experienced by reclaimers or customers are unjustified. While only some aspects of EPA's analysis regarding projected impacts of the rule were considered in developing this final rule, EPA notes that its analysis of the impacts of this provision is discussed in the Economic Impact and Benefits TSD. EPA disagrees with the commenter's assertion that the objectives of this rule—which addresses requirements under subsection (h) of the AIM Act—would already be achieved by previously established regulations pertaining to separate statutory requirements of the AIM Act. As noted above, the recordkeeping and reporting requirements under other regulations under the AIM Act would not achieve the same purposes as required in this rulemaking. The requirements under 40 CFR part 84 subpart A cited by the commenter provide information on reclamation totals and provide insight on reclamation trends. They do not provide information for compliance with the reclamation standard, nor would they provide information about reclaimed HFCs to those regulated entities servicing and/or repairing refrigerant-containing equipment. As detailed in the Economic Impact and Benefits TSD, EPA evaluated multiple scenarios regarding incremental impacts of this rule relative to actions that industry may or may not undertake in the baseline. EPA has presented results of the more conservative of these scenarios in this preamble. The Agency has taken into consideration, in this rule, requirements for reclaimed HFCs and expects these regulations will provide market signals that will support increased recovery of HFC refrigerants becoming available for reclamation, and will support reclaimers increasing the amount of reclaimed refrigerants available to meet the increased demand. The Economic Impact and Benefits TSD does not include increased recovery in the base case for this rule based on the assumptions for that scenario; however, EPA did consider an alternate scenario with increased recovery and anticipates that the reclamation provisions could support increased recovery during servicing or disposal where the refrigerant may otherwise have been

[95] See section IV.H.3 for discussion of speculative accumulation requirements per the RCRA alternative standards.

vented or released. EPA also notes that estimated compliances costs resulting from the final rule are significantly lower than those assessed for the proposed rule, because the requirements finalized in this rule are narrower in some respects than those evaluated in the proposal. EPA reiterates that this rulemaking is designed to serve the purposes identified in subsection (h)(1) of the AIM Act of maximizing reclamation and minimizing the release of regulated substances. While, as noted previously in this preamble, EPA has included estimates of the costs and benefits of this rulemaking in analyses that are available in the docket for this rulemaking, including in the Economic Impact and Benefits TSD, to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, nothing in the AIM Act requires EPA to consider costs or identifies any particular cost-based metric or analytical approach for use in evaluating and establishing regulations to implement subsection (h). The commenter correctly stated that subsection (h) of the AIM Act does include a small business grant program that is subject to appropriation availability. Subsection (h)(5) provides this program for the purchase of new specialized equipment for the recycling, recovery, or reclamation of a substitute for a regulated substance, including the purchase of approved refrigerant recycling equipment for recycling, recovery, or reclamation in the service or repair of MVAC systems. Funds have not been appropriated for this grant program and the establishment of this program is outside the scope of this rulemaking.

Comment: One commenter questioned why contractors seem to de-select reclaimed refrigerants, noting the differences between the AHRI 700 standard and new refrigerants supplied with 99.99 percent purity and precision blending. The commenter suggested EPA consider upgrading the specification to match the current supply of virgin refrigerants.

Response: In response to the commenter's question regarding use of reclaimed refrigerants in the RACHP sector, EPA notes that certain ODS may only be available as reclaimed for use in particular applications with the ODS phaseout. For example, since 2020, only reclaimed HCFC–22 can be used to service appliances in the RACHP sector. The same is true for appliances using CFCs since the 1990s. The Agency is not aware of any concerns from the RACHP servicing industry stemming from these requirements. The Agency considers this example and the broader ODS reliance on reclaimed ODS as informative in the context of this rulemaking.

EPA acknowledges that both reclaimed and virgin HFCs are required to meet the AHRI 700 purity standard and that even with compliance with the AHRI 700 purity standard, there may be minor differences between reclaimed and virgin refrigerant (such as moisture content). However, these minor differences do not impact the functionality of the reclaimed refrigerants in equipment nor do they suggest marked differences between reclaimed and virgin refrigerants as both are required to reach, at a minimum, AHRI 700 levels of purity. These differences should not impact the equipment that uses these refrigerants. Accordingly, EPA is not making any change to the applicable specifications to match the current supply of virgin refrigerants in this final action.

Comment: One commenter requested that EPA acknowledge the unique challenges of returning diverse blends to ASHRAE specifications without blending a significant amount of virgin content. The commenter cited five- and three-component refrigerant blends that may be challenging to return to their nominal composition, require more than 15 percent virgin refrigerant, or use an HFC that is rarely used and therefore not recovered in sufficient quantities. The commenter provided an example of a newer blend, R–471A, which is a three-component blend that consists of two HFO components and HFC–227ea. The commenter further states that HFC–227ea is rarely used as a refrigerant today, and it would be difficult to produce reclaimed R–471A based on this. The commenter recommended increasing the permissible virgin percent composition to avoid eliminating ASHRAE A1 refrigerants that comply with the 2023 Technology Transitions Rule. Another commenter opposed the 15 percent limit and stated that the standard may be feasible for limited use of the two-component blend, R–410A, as was done in CARB's program. The commenter further stated that the standard could not be used to correlate to three, four, and five component blends that have varying physical properties and would require varying cost-effective technical options to bring the material to appropriate standards.

Another commenter supported EPA's 15 percent virgin content standard for refrigerant blends with fewer than three components but recommended 65 percent reclaimed content and 35 percent virgin HFCs for blends with three or more components to account for minor additions in certain products and issues with leak fractionation. Two commenters recommended phasing in the virgin refrigerant limit over several years. One of the commenters recommended starting with a 90 percent virgin product in 2028 and progressing to the 15 percent limit. The commenter noted this would enable the market to adjust.

Response: EPA acknowledges these comments on multi-component blends. EPA is not establishing varying percentage limits for virgin HFC refrigerant based on the number of components in a refrigerant blend or a phase in approach by percentage. As explained in prior responses, the Agency is establishing an upper limit for virgin HFCs in reclaimed HFCs of 15 percent by weight. EPA acknowledges the reclamation challenges in working with blends, and in particular with three or more component blends. The Agency notes that there are technologies available to effectively reclaim such blends and reclaimers with the technical capability to do so. Further, EPA notes that many blends with three or more components are currently being reclaimed. The Agency provides an assessment of the anticipated demand of some of these blends related to the requirements in this rule for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in three RACHP subsectors in its *Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices.* Among these blends are R–404A, R–407A, R–407C, and R–452A. With the exception of R–452A (which is composed of two HFCs and an HFO), each of these blends have HFCs as all three components. EPA discusses supply of reclaimed HFCs in comment responses in section IV.E.2, and the Agency further notes that it is likely that components of blends will be reclaimed and reconstituted. For example, R–410A is the most commonly reclaimed HFC blend, and it is expected to be a significant source of its components (HFC–32 and HFC–125) as reclaimed. It is possible that these reclaimed components from R–410A may be used in these three-component blends to meet the estimated demand. In the case of R–452A, EPA notes that the reclamation standard finalized in this rule only applies to the HFC components of the blend and not the HFO portion (which is a substitute for an HFC).

In the case of multi-component blends with more than three components, EPA notes that there is estimated demand, as presented in the *Analysis of the U.S. Hydrofluorocarbon Reclamation Market:*

Stakeholders, Drivers, and Practices, for two such blends: R–448A and R–449A. R–448A is a five-component blend composed of three HFCs and two HFOs, while R–449A is a four-component blend, composed of three HFCs and one HFO. As noted and described in this preamble, the reclamation standard finalized in this rule does not apply to substitutes for HFCs, which in the case of these blends would be the HFO portions. The reclamation standard finalized in this rule only applies to the HFC portions of these blends, and as EPA has noted, could be met by the reclamation of the individual components and reconstituted to a blend. Single-component refrigerants and two-component blends are currently the most commonly reclaimed substances, and they are also the most common in installed equipment. However, per data reported under regulations under section 608 of the CAA, blends with three or more components, including R–448A and R–449A, are also currently being reclaimed. EPA anticipates that with increased significance on reclaimed HFCs as the phasedown progresses and as these three or more component blends continue to be used in equipment, the reclamation of these blends will also increase. Given the availability of such technologies and for reasons explained elsewhere in this preamble and responses to other comments, EPA considers the 15 percent upper limit for virgin HFCs to be technically feasible commensurate with the compliance date.

EPA also considers a 15 percent limit to better serve the purpose identified in subsection (h)(1) of the AIM Act of maximizing reclamation than using a higher percentage would. Further, the compliance date provides time for the reclaimers and the market to adjust. Therefore, EPA is not establishing a phased-in approach. Lastly, EPA acknowledges there are some blends that rely on HFCs that are not as commonly used as refrigerants, including newer blends such as R–471A and certain ASHRAE A1 refrigerant blends that are compliant with certain restrictions under the 2023 Technology Transitions Rule. EPA notes that HFC–227ea is more commonly used in the fire suppression sector and only to a far lesser extent used in refrigerant blends. The Agency notes, however, that HFC–227ea is currently being reclaimed and reported to EPA under the regulations under CAA section 608. Further, EPA clarifies that the provisions finalized in section 84.112(b) state that recovered regulated substances must have had bona fide use in equipment but does not specify that the recovered substance needed to be used a refrigerant and then recovered. The Agency also states that it is only establishing requirements for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs in three RACHP subsectors, that will primarily require reclaimed HFCs and blends that use components that have been common for many years (and in some cases, even decades). As noted in the *Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices,* R–410A, HFC–134a, and R–404A are the most common HFCs/HFC blends in the current stock of installed equipment, by mass. The Agency also reiterates that the limit on virgin materials only covers the HFC portion of a blend and refers to a previous response on calculating the allowable mass of virgin HFCs in a previous response as it relates to blends that contain an HFC and non-HFC component or more than one HFC component.

EPA acknowledges that multi-component blends may have different challenges in relation to their reclamation as compared to the reclamation of single-component refrigerants or two-component blends. However, as stated previously, EPA notes that many multi-component blends are currently being reclaimed, as are the components that make up these blends. As a general matter, the increased introduction and use of multi-component blends over the past five to ten years has meant that manufacturers of equipment and the servicing sector have had to adapt to using these blended refrigerants. As the commenter did not specify which types of varying cost-effective technical options might be considered for the reclamation of multi-component blends, EPA anticipates the commenter may be referring to how reclaimers consider if more sophisticated technologies (*e.g.* fractional distillation) are needed as compared to blending or rebalancing with virgin material. EPA understands these considerations may vary depending on the technical capabilities of a reclaimer and other market dynamics. Further, as described in section IV.E.2, EPA is finalizing a discrete reporting requirement to evaluate the availability of reclaimed HFCs intended for servicing and/or repair of refrigerant-containing equipment in the covered RACHP subsectors, which will also be useful in assessing the degree by which these multi-component blends are reclaimed.

Comment: One commenter recommended adding ''and HFC substitutes'' to proposed reclaim requirements to avoid replicating past regulatory gaps that led to environmental consequences and to provide for comprehensive refrigerant management. The commenter stated that the addition of substitutes would avoid disparities and possible misinterpretation. The commenter stated that, if HFC substitutes are not held to the same standard, concerns about mishandling, venting, and ownership will be likely. Another commenter advocated for a mandatory reclamation of all refrigerants in the United States, excluding hydrocarbons. The commenter noted that many HFC substitutes are HFCs themselves and cited the AIM Act's requirement that EPA maximize reclamation and minimize release of HFCs and their substitutes. The commenter anticipated that transitioning to HCFOs or other chemicals could pose environmental concerns without sufficient life cycle management plans, including limiting releases, and suggested that all refrigerants be collected and transported to an EPA-certified reclaimer.

Response: EPA is clarifying the Agency is defining the term ''substitute for a regulated substance'' to explicitly establish for purposes of the regulations established in this rulemaking under 40 CFR part 84, subpart C that substitutes for HFCs are substances that are not HFCs. EPA recognizes that in the context of other rulemakings under the AIM Act (*e.g.,* 2023 Technology Transitions Rule), substitutes may be used to refer to a lower-GWP substance that may or may not include HFCs or blends containing HFCs. In this context of this rulemaking, EPA is using a different definition to help distinguish between those requirements that apply to HFCs and those that apply to substitutes for HFCs. EPA is finalizing, as was proposed, to not require limits on the amount of virgin substitutes for HFCs in reclaimed refrigerant, whether neat or in blends. This exception is not a blanket exception from all aspects of this rule or other related regulations. For example, all regulated substances and non-HFC substitutes for HFCs with GWP greater than 53 would be subject to the leak repair requirements established in this rule. Further, EPA notes that HFCs and certain substitutes for HFCs, including HFO and HCFO refrigerants, are not exempt from the venting prohibition under 40 CFR 82.154, and it is illegal to knowingly vent or otherwise release such refrigerants into the environment while

maintaining, servicing, repairing, or disposing of an appliance or IPR. EPA is aware that substitutes for HFCs are increasingly being used in certain RACHP subsectors and are commonly used in refrigerant blends with HFCs. Any refrigerant blend that contains an HFC would be subject to the leak repair requirements in this rulemaking, which are being established consistent with the purposes identified in subsection (h)(1) of the AIM Act, including maximizing reclamation and minimizing the release of regulated substances from equipment. EPA decided to limit the requirements that apply to substitutes for HFCs in this rule to those substitutes for HFCs with GWPs above 53 for reasons articulated in this final rule and in the proposal. EPA is applying this cutoff because it is the lowest GWP among regulated substances in the AIM Act. Further, the installed stock of these substitutes for HFCs is not as established as the installed stock of refrigerant-containing equipment with HFCs or refrigerants that contain HFCs. However, the installed stock of these substitutes for HFCs may be important in the future, and EPA may reevaluate this decision in the future and may consider applying other aspects of this program to non-HFC substitutes. As noted in a previous response, EPA interprets subsection (h) to authorize regulations that would apply to substitutes for HFCs.

Comment: One commenter noted that reclaimed refrigerant has never needed to be labeled in the industry and stated that requirements to label reclaimed refrigerant would create an additional ''product'' despite the reclaimed gas being chemically and functionally identical to virgin. The commenter stated that the greatest benefit to reclaimers is if reclaimed refrigerant is marked as fungible with virgin refrigerant. The commenter stated that labeling reclaimed refrigerant could lead to a perception that reclaimed material is of lesser quality and therefore had to be mandated by a Federal agency. The commenter claimed this could depress reclaimed gas sales contrary to the AIM Act's direction, and would create confusion about why two different classes of refrigerant exist in the market. Another commenter opposed the recordkeeping and labeling requirements and claimed that there was no clear need to ensure that reclaimed refrigerants are easily recognized by servicers because technicians only need assurance that the material meets appropriate specifications for the particular HFC or HFC blend. The commenter stated that requirements for reclamation occurring at the batch level further reduced the meaning of the proposed container marking requirements. The commenter stated that compliance with EPA's proposed mandate was the only reason servicers would need to distinguish between reclaimed and virgin material. The commenter suggested that EPA should instead clarify that for current reclaimer reporting, a reclaimer's annual total reported reclamation should match the reclaimer's reported annual total of recovered input minus waste, which could be a less burdensome alternative that the Agency should consider. A third commenter recommended the use of a label or QR code to disclose the amount of bona fide recovered refrigerant in reclaimed material. The commenter advocated detailed data on chain of custody to avoid false claims and illegal trade, with a ''credible paper trail throughout its return to service.''

Response: EPA acknowledges that this labeling requirement is new and may vary from current practices. The Agency disagrees that the labeling requirements would designate reclaimed refrigerant as being inferior to virgin refrigerant and disagrees with the commenter's description of the perceived rationale for a Federal agency mandate. The Agency was clear in the NPRM and in this final rule that reclaimed refrigerant is capable of performing the same functionality of virgin refrigerant in equipment. Both are required to meet the exact same purity standard (*i.e.,* based on AHRI 700). The labeling requirements are being established to support the required uses of reclaimed refrigerants and to indicate that the reclaimed refrigerant contains no more than 15 percent, by weight, virgin HFCs, thus promoting a consistent understanding of what reclaimed refrigerants are. Given the requirements for the servicing and/or repair of certain refrigerant-containing equipment to be done with reclaimed HFCs in this final action, labeling will help regulated entities comply with those obligations. Thus, EPA disagrees with the comment that there is no need for technicians to be able to easily recognize reclaimed refrigerant. As such, the labeling requirement helps to support the purpose identified in subsection (h) of the AIM Act to maximize reclamation.

The Agency further notes that use of similar labels that indicate use of recycled materials is common practice throughout a wide range of industries and products. Many consumers value and seek out recycled materials or products. The requirements that both virgin and reclaimed HFC refrigerants must meet the same standards for purity based on AHRI–700 is relatively new, and in fact EPA regulations under CAA section 608 only applied the requirement to meet the AHRI–700 purity standard to reclaimed refrigerants.[96] EPA acknowledges that some applications require higher purity material than AHRI–700 (*e.g.,* metered dose inhalers) and there may be contractual arrangements that limit entities to suppliers of virgin or reclaimed refrigerant only at this time. However, as noted throughout this final rule, as the phasedown of the production and consumption of virgin HFCs continues, demand for reclaimed HFC refrigerant will grow. Thus, the required label will provide pertinent information to purchasers and users of refrigerants and help them to select a refrigerant that meets their needs in particular situations. EPA responds that the commenter's concern that a new label could signal a new separate ''product'' seems unfounded given that all reclaimed HFCs will be required to be labeled as such and there is an overall requirement for labeling of HFCs. Further, EPA is aware of at least one reclaimer that specifically markets a line of refrigerants as reclaimed refrigerant.

EPA acknowledges the comments raising chain of custody concerns. EPA is imposing recordkeeping requirements providing the name, address, contact person, and the phone number of the reclaimer certified under 40 CFR 82.164, as well as information about the date the container was filled and the amount of the regulated substance in the container. Batch and substance identification information is included in these requirements along with the percentage, by weight, of the virgin regulated substances. The labeling and certification requirements in this rulemaking help to ensure that purchasers and users of reclaimed refrigerant are receiving and/or using a product that has been verified to be reclaimed to the proper purity, as well as meeting the 15 percent limit on virgin HFCs.

Comment: Many commenters commented on limiting recovered and reclaimed material to substances removed from equipment or systems in the United States. One of the commenters stated that limiting the source of material to the United States would help EPA ensure the quality of material, confirming that only standard-

[96] EPA finalized a requirement that all HFCs (both virgin and reclaimed) imported, filled in containers domestically, and sold as refrigerants meet the specifications in appendix A to subpart F of part 82—Specifications for Refrigerants, see Allocation Framework Rule at *https://www.federalregister.gov/d/2021-21030/p-679.*

compliant material is utilized, and allow for greater transparency and traceability throughout the reclamation process, facilitating monitoring and enforcement, ensuring the program operates effectively and efficiently. Another commenter stated that illegally traded HFCs will decrease reclamation. One commenter asserted that neither reclaimed nor virgin material should be imported for destruction for carbon credit purposes and that EPA should instead prioritize recovery and reclamation in the U.S. market.

One commenter suggested that geographic limits and quality control are necessary to ensure bona fide use and recovery and ensure compliance with the reclamation standard and maximum virgin content. The commenter claimed that incidents of importing virgin refrigerant sold as counterfeit reclaimed refrigerant have been documented under previous ODS phaseout regimes and that requirements to expend allowances for bulk imports does not ensure compliance with the 15 percent limit. The commenter also stated that importers of pre-charged equipment would not be subject to the same allowance requirements. In contrast, the commenter claimed that requirements to use domestically reclaimed refrigerant will be verifiable and enforceable, particularly with the proposed tracking and labeling requirements which will support a strong domestic market. Another commenter questioned how EPA would monitor that refrigerant was reclaimed with the authorized limit of virgin material and suggested that relying on certifications would be an invitation to abuse, especially for refrigerant reclaimed overseas. Another commenter expressed concern that imported refrigerant could be incorrectly labeled as reclaimed if it came from countries with excess production. Conversely, the commenter stated that more profitable exports of recovered refrigerant could starve domestic servicing needs.

Another commenter stated that, without a geographic limitation for reclaimed or recovered refrigerant sourcing, refrigerant recovered abroad will not reduce U.S. emissions nor create market incentives to improve domestic recovery and verifying recovery or reclamation abroad will be very challenging, potentially indirectly advantaging importers of pre-charged equipment sourcing cheaper or even counterfeit material. The commenter also stated that the United States should not aim to receive reclaimed HFCs from the world because Kigali Amendment ratifiers need to implement their own phasedowns and it would be better to reuse HFCs within their countries of origin. The commenter also suggested that there is an incentive for cheating given that importing reclaimed HFC–32 requires fewer allowances than HFC–410A. The commenter encouraged setting up trade agreements for import of reclaimed HFCs where a similar HFC phasedown schedule exists.

Another commenter requested that EPA make clear that reclaimed refrigerant must have been recovered from equipment in the United States or that reclaimed material from outside the United States be allowed only if it was legitimately recovered, disclosed upon import, and followed EPA's current process for legacy refrigerants. An additional commenter suggested that EPA establish standards and a certification process to ensure reclaimed refrigerant is authentic and has a known point of origin. Another commenter stated that it is important that importers of pre-charged equipment be required to purchase reclaimed HFCs from EPA-certified reclaimers in the United States, either using reclaimed material to charge equipment in the United States or dry-shipping equipment and charging it in the United States. The commenter suggested requiring the dry shipment of equipment to be charged in the United States, to minimize the transport of reclaimed HFCs across countries.

Response: EPA acknowledges these comments regarding the verifiability of recovered and reclaimed HFCs particularly outside the United States. The Agency is not establishing a requirement that recovered or reclaimed HFCs be sourced only from equipment in the United States in this final rule. The Agency understands the commenters' concerns to ensure that refrigerant that is recovered and sent for reclamation can be confirmed as having a bona fide use in refrigerant-containing equipment, as this rule requires, and that there can be challenges in verifying imported material claiming to be recovered or reclaimed. EPA anticipates that in most cases, recovered material that reclaimers receive would have been sourced from refrigerant-containing equipment within the United States. Under the requirements previously established in separate regulations in 40 CFR part 84, subpart A, import of any bulk HFCs to the United States, whether virgin, reclaimed, or recovered, requires expenditure of the requisite number of allowances and associated reporting and recordkeeping under those regulations. Thus, if one were to import any recovered HFCs to be reclaimed within the United States, allowances must be used. As stated, EPA anticipates reclaimers would likely seek to obtain recovered materials from within the United States, as they would not require allowances to receive these domestically recovered HFCs. The regulations under 40 CFR part 84, subpart A are designed to provide recordkeeping and reporting requirements for the requirements under subpart A, but the Agency notes that this reported information may also be useful in identifying if practices are occurring that would violate the regulations established in this final rule. Even if commenters are correct about current incentives regarding imports, as the HFC production and consumption phasedown progresses, and the overall quantity of available allowances decreases, importers will need to make decisions about how to expend their allowances, and those incentives may shift.

In response to comments related to requiring geographic limits to ensure that recovered materials had bona fide use in equipment, EPA concludes that such restrictions are not required to ensure the provisions in this rule are being followed. The requirements in this rule are such that the servicing and/or repair of certain refrigerant-containing equipment must be done with reclaimed HFCs, and the reclaimed HFCs must meet the standard of containing no more than 15 percent virgin HFCs, by weight. EPA has established labeling provisions for EPA-certified reclaimers to affix labels on containers they fill with reclaimed HFCs to certify that the standard is being met. As such, any material that is reclaimed by an EPA-certified reclaimer would have a label certifying compliance with the reclamation standard. If one chooses to import reclaimed HFCs and sell, identify, or report market it as being reclaimed for use in the installation, servicing, or repair of refrigerant-containing equipment, they would need to verify that the imported reclaimed HFCs are meeting the reclamation standard to ensure they are in compliance with the requirements finalized in this rule at 84.112(a). Further, under this final rule, those servicing and/or repairing refrigerant-containing equipment in the supermarket systems, refrigerated transport, or automatic commercial ice makers subsectors that contains an HFC must do so with reclaimed refrigerant that meets certain requirements including the reclamation standard. Thus, they would need to confirm that the reclaimed HFC refrigerant they are using for these purposes meets those requirements to ensure they are in compliance with their obligations. Moreover, this final rule establishes

certain requirements for the sale, distribution, or transfer of ownership for certain recovered HFCs, including reclaiming the HFCs prior to such sale, distribution, or transfer, with limited exceptions. Thus, if one chooses to expend allowances and import recovered HFCs, the recovered HFCs must, as applicable be reclaimed before being sold, distributed, or transferred to a new owner. See also subsection (h)(2)(B) (providing that a regulated substance used as a refrigerant that is recovered shall be reclaimed before the regulated substance is sold or transferred to a new owner, except where the recovered regulated substance is sold or transferred to a new owner solely for the purposes of being reclaimed or destroyed). Further, as required by this rule, the EPA-certified reclaimers who fill reclaimed HFCs into containers for sale or distribution will need to ensure the reclaimed HFCs meet the reclamation standard of no more than 15 percent virgin HFCs, by weight, and will need to comply with the applicable labeling and recordkeeping requirements.

In response to the comment stating that refrigerant recovered abroad will not reduce U.S. emissions and may disincentivize domestic recovery, EPA disagrees and states, as noted earlier in this comment response, that allowances are required to import any HFCs. Thus, any HFCs (whether virgin, reclaimed, or recovered) that are imported require the expenditure of allowances that have been allocated and accounted for under other regulations under the AIM Act. If recovered materials are imported, they would have been accounted for under the phasedown and would not contribute to additional emissions. EPA also disagrees that imports of recovered materials could disincentivize domestic recovery of HFCs. Reclaimers do not need to expend allowances to receive HFCs that are recovered domestically, which EPA anticipates being an incentive for reclaimers to primarily seek domestically sourced recovered HFCs as source material for reclamation. EPA acknowledges that whether recovered materials are reclaimed in the United States as opposed to exported may come down to a business decision; however, the requirements in this rule would promote reclaimed HFCs in the servicing and/or repair of certain refrigerant-containing equipment. These requirements would likely, in turn, promote recovery of HFCs to be reclaimed to meet the demand for servicing and/or repairing these equipment as opposed to exporting the recovered materials.

EPA understands that illegal trade of HFCs may decrease demand for refrigerant reclamation, and moreover, is a concern for the successful implementation of the phasedown. Outside of this rulemaking, EPA has already established a multifaceted enforcement approach to deter the illegal import of HFCs. The strong compliance and enforcement system will help preserve the environmental and economic benefits of the HFC phasedown.

With respect to the comments related to other countries' implementation of the Kigali Amendment and the import of virgin or reclaimed material for destruction or carbon credit purposes, the topics are out of scope for this rulemaking, and thus these comments require no further response. For additional clarity, the Agency notes that under 40 CFR 84.25, EPA does allow the import of regulated substances into the United States for destruction, subject to a petition process. However, the provisions included in 40 CFR 84.25 are out of scope for this rulemaking.

EPA also received comment that reclaimed feedstocks sourced from the United States should be treated similarly to imports for transformation, with no time limit for how long they can be stored under 40 CFR 84.25, and that domestic reclaimed feedstocks awaiting blending or fractionation should be treated equivalently to HFCs imported for destruction. As noted above, provisions included under 40 CFR 84.25 are out of scope of this rulemaking, and thus the comment requires no further response. EPA further notes that the commenter appears to be using the term "feedstock" in a way that diverges from the Agency's use of that term. For example, as explained further in the 2024 Allocation Rule, creating a blend is a completely different process from producing HFCs in the first instance, in which feedstock chemicals are entirely consumed as part of a production process. See 88 FR 46836, 46863 (July 20, 2023).

EPA notes that it is not finalizing the proposed requirements for the initial fill of new refrigerant-containing equipment with reclaimed HFCs in this rulemaking, as discussed elsewhere in this section and in section IV.E of this preamble. Thus, to the extent these comments relate to those proposed requirements for initial fill of such equipment, EPA need not respond further to them in this action. EPA is requiring bona fide use for recovered HFCs that are used to meet the requirements established in this rule related to the provisions for reclaimed HFCs. Circumventing those requirements by importing pre-charged equipment and recovering the refrigerant without bona fide use would be inconsistent with the requirements of this final rule.

2. Requirements for servicing and/or repair of existing equipment in the RACHP sector EPA proposed that the servicing and/or repair of refrigerant-containing appliances in certain subsectors and applications in the RACHP sector where HFCs (whether neat or in a blend) are used would need to be done with reclaimed HFCs starting January 1, 2028. EPA proposed these requirements for refrigerant-containing appliances in the following RACHP subsectors:

- Stand-alone retail food refrigeration;
- Supermarket systems;
- Refrigerated transport; and
- Automatic commercial ice makers.

EPA is finalizing this provision with modifications after consideration of the comments. EPA is requiring that the servicing and/or repair of refrigerant-containing appliances in certain subsectors and applications in the RACHP sector where HFCs (whether neat or in a blend) be done with reclaimed HFCs starting on January 1, 2029, one year later than the proposed date of January 1, 2028. Further, EPA is finalizing the requirement for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs for some (but not all) of the subsectors addressed in the proposal. EPA is not finalizing this requirement for stand-alone retail food refrigeration but is establishing the requirement for refrigerant-containing equipment in the supermarket systems, refrigerated transport, and automatic commercial ice maker subsectors.

As noted in section I.B, EPA is not finalizing as part of this action the proposed provisions for container tracking of HFCs that could be used in the servicing, repair, and/or installation of refrigerant-containing or fire suppression equipment. However, EPA is establishing a discrete reporting requirement for reclaimers and refrigerant distributors that supply reclaimed HFCs in the affected RACHP subsectors (*i.e.,* supermarket systems, refrigerated transport, and automatic commercial ice makers). EPA is planning to use these data to monitor progress on the amount of reclaimed HFCs available for use in these subsectors ahead of the compliance date for the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in the covered RACHP subsectors. EPA is establishing this requirement in

response to, and based on consideration of, comments [97] seeking assessment and data associated with reclaim use and availability. EPA is establishing a discrete reporting requirement for these entities to provide this information to EPA, so that EPA can further evaluate the availability of reclaimed HFCs intended for servicing and/or repair of equipment in these subsectors. The reporting requirement will require two annual reports (*i.e.,* one report in each of two years) to be submitted to the Agency, which includes information on the reclaimed HFC refrigerants sold or distributed to equipment owners and operators. Each annual report must be submitted by February 14 of the year following the reporting period and include information on the amounts and types of reclaimed HFCs intended for servicing and/or repair of equipment and sold in the covered subsectors over the preceding calendar year. The first report is due on February 14, 2027, and covers activity from January 1, 2026, to December 31, 2026; the second report is due on February 14, 2028, and covers activity from January 1, 2027, to December 31, 2027. The Agency notes that these compliance dates coordinate with the labeling requirements being established in this rulemaking, such that refrigerant distributors would know which containers contain refrigerants with reclaimed HFCs. EPA intends to use this information to further evaluate the ability to comply with the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in these subsectors as established in this rulemaking. Further, the two-time reporting will allow EPA to assess the one-year trend in availability of reclaimed HFCs for use in the servicing and repair of refrigerant-containing equipment in the covered subsectors. EPA will review this information and may consider proposing changes to the provisions, if warranted.

EPA notes that the reporting requirements here contain certain data elements that are similar to data elements that were originally proposed as a part of the container tracking provisions. As noted, the Agency is not finalizing those provisions in this action; however, the public was aware of EPA's interest in information on these topics through the proposal to include similar data elements in those other provisions. As commenters noted, and EPA agrees, there is value to collecting such data as it pertains to provisions that are being finalized in this rulemaking; notably, the requirements for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs. Thus, these reporting requirements are being established as requirements that are separate and distinct from the proposed tracking system requirements, although they include a limited number of data elements that are similar to some included in the proposed tracking system requirements. For example, these reporting requirements are different from the proposed tracking system requirements because they are being established to occur only twice and do not require data elements be reported at an individual container level.

Comment: Several commenters expressed broad support for EPA's proposed requirements for the recovery and reclamation of HFC refrigerant. Some commenters stated, consistent with the preamble to the proposal, that reclamation can bolster the current HFC supply, support a smooth transition to HFC substitutes, minimize disruption of the current capital stock of equipment, avoid supply shortages of virgin refrigerants, and help to finance refrigerant recovery. Two commenters stated that because the proposed use requirements apply only to HFCs and not their substitutes, EPA's approach could encourage certain users to transition away from HFCs altogether into lower-GWP substitutes. One commenter suggested that increasing HFC reclamation benefits the climate, economy, and all users of cooling equipment and supports the availability of refrigerants for increasing demand for refrigerants in heat pumps for building decarbonization. The commenter further agreed that as proposed, the rule will help insulate the industry, and consumers, against price spikes that could affect the servicing of existing systems using HFCs. Another commenter stated that the provisions would send a strong market signal in favor of increased reclamation and lead to a reduction of HFC emissions and venting. Another commenter stated that sufficient reclamation volume may help reduce demand for new, virgin HFC production and consumption, which is more emissive than the reclamation process, and that the implementation of the subsection (h) rule can be a transformative force, particularly in addressing low rates of HFC reclamation.

One commenter generally supported reclaimed refrigerant mandates to drive recovery and stimulate investment, but requested that the final requirements be sensitive to market conditions in terms of current and projected refrigerant supply, production, and consumption. The commenter stated that they did not support claims that reclaim mandates are not feasible because of insufficient material to meet demand or because market data for a given year takes time to accumulate and analyze. Another commenter supported regulations to increase the use of reclaimed refrigerants in the market, specifically through the incentivization of recovery and/or improvement of EPA's ability to enforce recovery. Another commenter also claimed that reclaimers have made significant progress investing in and installing technology to reclaim complex HFCs including fractional distillation to expand reclamation capacity.

Response: EPA acknowledges these supportive comments. The Agency agrees that the volume of reclaimed HFC refrigerants will grow significantly in the coming years particularly as the production and consumption of virgin HFCs decreases consistent with the phasedown provisions under the AIM Act. EPA anticipates this increased volume will support compliance with the requirements related to reclaimed refrigerants finalized in this action and addresses other comments related to supply of reclaimed HFCs in more detail in another response in this section. However, as described earlier in this section, EPA is establishing a discrete reporting requirement for data on the availability of reclaimed HFCs used in the servicing and/or repair of refrigerant-containing equipment in the covered RACHP subsectors and EPA may evaluate the requirements established in this rulemaking after assessing the reported data. With respect to the comment suggesting that the final requirements be sensitive to market conditions, EPA notes that these discrete reporting requirements will improve EPA's ability to evaluate market conditions and consider whether adjustments are appropriate.[98]

EPA responds to comments stating that these provisions may result in some

[97] EPA received multiple comments, available in the docket of this rulemaking, related to taking a data driven approach to establish requirements for servicing and/or repairing refrigerant-containing equipment with reclaimed HFC refrigerants. Examples include EPA–HQ–OAR–2022–0606–0109, EPA–HQ–OAR–2022–0606–0121, and EPA–HQ–OAR–2022–0606–0147, among others.

[98] To the extent this commenter refers to refrigerant production and consumption, EPA further notes that it appears that the commenter may be using these terms differently from how EPA uses them, and it is not clear what relevance those terms have in this context. Both of these are defined terms under the AIM Act, and as defined in 40 CFR 84.3 they refer to regulated substances.

equipment owners or operators switching to a refrigerant that is a substitute for an HFC by noting that entities may choose to transition to a different refrigerant for a number of reasons. For example, some equipment owners or operators may choose to transition on a decision based on energy efficiency. However, EPA is establishing reclamation requirements for servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors to promote reclamation of HFCs, consistent with the purpose identified in subsection (h)(1) of the Act of maximizing reclamation of HFCs. The Agency is not establishing these provisions as a means to promote transitions to substitutes for HFCs. While EPA did not primarily focus on this provision as a way to minimize emissions of HFCs from refrigerant-containing equipment, the Agency describes in the Economic Impact and Benefits TSD that the reclaim requirements may lead to additional emission reductions by increasing recovery of refrigerant at equipment disposal. In our analysis, however, we assumed such emission reductions would take place due to previous AIM Act regulations (although not specifically required by such) and normal, business-as-usual practices by the industry—for instance in response to the venting prohibition in 40 CFR 82.154—and so conservatively did not include such emission reductions as benefits attributable to this rule. The Agency views other provisions finalized in this rule as primarily focused on minimizing emissions (*e.g.,* leak repair requirements as discussed in section IV.C). The Agency acknowledges these comments related to supply and availability of reclaimed HFCs as well as the availability of advanced reclamation technologies for efficient reprocessing and complex separations. Many commenters provided support that the supply of reclaimed HFC refrigerants would be adequate to achieve the provisions in this rulemaking, while other commenters noted concerns on supply. Further, commenters provided information on the availability and current use of these technologies to support the requirements of this rulemaking. EPA agrees with commenters that there is adequate supply of reclaimed HFC refrigerants to support the provisions in this rulemaking. Comments related to supply of reclaimed HFCs are discussed in additional detail in other responses later in this section and in section IV.E.1.

The Agency agrees with the comments stating that increased reclamation could help to reduce the demand for virgin HFCs, particularly for HFCs such as those used in servicing and/or repair of refrigerant-containing equipment in RACHP subsectors such as supermarket systems, refrigerated transport, and automatic commercial ice makers. Further, EPA agrees with the comments stating that increased reclamation is likely to help insulate the market from possible price spikes for certain refrigerants as the phasedown of the production and consumption of virgin HFCs progresses. Reclaimed HFCs are and will continue to be an important source for refrigerants for existing refrigerant-containing equipment. As virgin HFCs may become scarcer to support the servicing and/or repair of existing refrigerant-containing equipment, reclaimed HFCs will be increasingly more vital. EPA also acknowledges comments stating the reclamation process is overall less emissive than production of virgin HFCs for use as refrigerants. However, EPA believes this point warrants further evaluation in the context of the U.S. market, and thus, is not concluding that the reclamation process is overall less emissive than the producing virgin HFCs for use as refrigerants.

EPA recognizes the importance of increased recovery as it relates to maximizing reclamation. In agreement with some of the comments, EPA anticipates that the provisions in this rule would drive additional recovery to support the reclamation of HFCs. EPA discusses the anticipated effect of increased recovery in responding to another comment in this section. For example, additional recovery is expected as more refrigerant-containing equipment reaches their end-of-life, and the value of refrigerants needed to service existing refrigerant-containing equipment increases.

Comment: Several commenters supported reclaim requirements for servicing existing equipment. One commenter stated that all HFC refrigerants used in the servicing of equipment should be applicable to the proposal. One commenter generally supported reclaim requirements for the sectors specified. The commenter recommended extending servicing requirements to additional subsectors as adequate reclaimed HFC supplies become available. Another commenter supported the role of recovery and reclamation of refrigerants, particularly as the supply of virgin HFCs is reduced.

Some commenters expressed support for the use of reclaimed refrigerants in existing equipment and urged EPA to maximize the use of reclaimed refrigerants in the market. One commenter claimed that until the transition to near-zero GWP refrigerants is complete, the use of reclaimed refrigerant will lessen the impact of continued use of mid-range GWP refrigerants and will help avoid stranding existing higher-GWP equipment that may be well within its useful life. Another commenter stated that a reclaim mandate for servicing of existing equipment would be reasonable, as refrigerants supplied to service equipment are distributed through many channels and would not conflict with current business models. Another commenter requested that reclaimed refrigerants be mandatory only in servicing applications and states that the recovery of high-GWP refrigerants currently in use can be promoted more effectively, leading to a significant contribution towards mitigating global warming.

Another commenter generally supported most aspects of the proposed rule and stated that successful carbon reduction initiatives require cooperation among chemical manufacturers, wholesale distributors, technicians, EPA-certified reclaimers, and government agencies. The commenter appreciated EPA's transparent, collaborative, and market-neutral approach to the HFC allocation, technology transitions, and refrigerant management rulemakings.

Response: EPA acknowledges these comments in support of the provisions related to the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors. In the Agency's view, based in part on its experience with ODS-containing equipment, reclaimed HFCs will play an increasingly key role in supporting existing equipment as virgin materials become scarce; several of these comments provide additional support for that view. As described in more detail in responses later in this section, EPA is establishing requirements for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs in three RACHP subsectors: supermarket systems, refrigerated transport, and automatic commercial icemakers. EPA agrees that these requirements for the servicing and/or repair of certain refrigerant-containing equipment to be done with reclaimed HFCs are reasonable and will not be disruptive, as reclaimed refrigerants are available for these sectors and used to a degree already. EPA also is reiterating that the Agency is not at this time establishing requirements for the initial

fill of refrigerant-containing equipment with reclaimed HFCs in any RACHP subsectors and is maintaining the focus of this rulemaking on servicing and/or repair of equipment in the covered RACHP subsectors.

EPA acknowledges comments regarding evaluating for additional applicability of the requirements for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in other RACHP subsectors. The Agency discusses the consideration of additional subsectors in another response in this section.

Comment: One commenter stated that reclaimed refrigerant has played a crucial role in maintaining chillers for decades, starting with CFCs. The commenter also noted that reclaimed HCFC–22 played a critical role in the gaps of supply after EPA, in compliance with the Montreal Protocol, accelerated the HCFC phaseout schedule and banned HCFC–22 for new equipment when there were brief periods of concerns about shortages for servicing.

Response: EPA acknowledges this comment and agrees that reclaimed refrigerants have played an important role in servicing ODS equipment leading up to and since the production and consumption of those ODS have been phased out, as noted in a prior response in this section the Agency's experience with ODS-containing equipment informs its view that reclaimed HFCs will play an increasingly key role to support existing equipment as virgin materials become more limited. While this rulemaking does not include required use of reclaimed HFCs for chillers, EPA notes the commenter's example of the importance of reclaimed refrigerants to meet servicing demand where virgin refrigerants have become scarce.

Comment: Some commenters opposed the proposed requirements for the use of recovered and reclaimed HFCs for certain RACHP subsectors for servicing of existing equipment. The commenters claimed that the proposal is creating consternation and uncertainty for their supermarket customers who have already been converting their systems to low-GWP refrigerants as quickly as possible. The commenters also asserted that the HFC phasedown and 2023 Technology Transitions Rule will create demand for reclaimed refrigerants, and EPA does not need to impose mandates to accomplish this. The commenters strongly encouraged EPA to withdraw any mandates on the use of reclaimed refrigerant and allow market dynamics to create an increased demand for reclaimed refrigerant without the added burden of a compliance risk. A few additional commenters expressed opposition to mandating the use of reclaimed HFCs in the specific refrigeration sectors, arguing it is unnecessary market manipulation. Some of these commenters added that the best time for switching may not be the same across all sectors and supported allowing market forces to drive the transition to reclaimed HFCs. The commenters claimed that regulations may distort key market features and negatively impact consumers. Another commenter suggested that EPA delete requirements for use of reclaimed refrigerants from the rule.

One commenter suggested that the phasedown schedule, most imminently the 2024 reduction, will significantly reduce the supply of regulated substances. The commenter further stated that with the reduction in available allowances to produce or import virgin regulated substances, the supply of higher-GWP refrigerants will be reduced such that sufficient allocation is available to meet demand for lower-GWP refrigerants. The commenter stated that the 2023 Technology Transitions Rule by design, will increase the demand for lower-GWP refrigerants exponentially each year due to new appliance GWP limits. The resulting dynamic of these requirements will lead to an increase in the demand for reclaimed HFCs, especially to service the installed base of higher-GWP refrigerant-containing appliances. The commenter also stated that there is no evidence that the requirement to use reclaimed HFCs will lead to greater reclamation, and the Agency did not show how this aspect of the rule would reduce releases of refrigerant. Further, the commenter stated there is no need for regulation to create demand for reclaimed refrigerant. For these reasons, the commenter stated that EPA's proposal to require the use of reclaimed refrigerants in servicing of certain equipment is unneeded.

Response: EPA acknowledges the comments and concerns described. EPA understands that the supermarket industry, like many industries, has been transitioning to lower-GWP refrigerants over time and will continue to do so consistent with the GWP limits and compliance dates in the 2023 Technology Transitions Rule. EPA acknowledges the concerns raised by some entities within the supermarket industry regarding the available supply of reclaimed refrigerants that will also be compliant with the 2023 Technology Transitions Rule's GWP threshold for new supermarket systems. EPA notes that it is not, at this time, finalizing requirements for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs. Therefore, the Agency is not responding to comments on initial charge in this final rule.

In prior responses in this section, EPA noted the importance of reclaimed HFC refrigerant to support the continued operations of existing equipment, including certain older supermarket systems. The Agency agrees that existing market dynamics and other regulatory drivers may incentivize the use of reclaimed refrigerants over time, but disagrees with the conclusion that those possible incentives mean this requirement is unneeded. Congress put particular weight on reclamation in subsection (h) of the AIM Act, directing EPA in subsection (h)(1) to promulgate certain regulations, where appropriate, for purposes including maximizing reclaiming. Subsection (h)(2)(A) of the Act further provides that the EPA Administrator ''shall consider the use of authority available under this section to increase opportunities for the reclaiming of regulated substances used as refrigerants.'' This requirement is consistent with both of these provisions. Moreover, even assuming that market dynamics or implementation of other programs lead to some additional reclamation and use of reclaimed refrigerant over time, the commenters do not provide any reason to think that those factors alone would ''maximize'' reclamation. It is the Agency's view that the regulatory programs established under the AIM Act work in conjunction with each other and implementation of each is necessary as HFCs are phased down, and the reclaim requirements established in this action will help increase reclamation and support additional recovery of HFC refrigerants, as discussed in another comment response in this section. To the extent that the comments intend to suggest that EPA should provide a particular type or amount of information related to each regulatory provision's effects on increasing reclamation or reducing releases, EPA disagrees. As explained earlier in this preamble, as EPA interprets the statutory text in subsection (h)(1), the suite of regulations established under subsection (h)(1) of the Act, taken together, are focused on serving the three purposes identified in subsection (h)(1), but individual regulatory provisions under subsection (h)(1) need not each connect to all three purposes. This interpretation is integral to establishing an effective regulatory program, as some regulatory provisions

that might be considered under (h)(1) may be highly efficacious at addressing one of the regulatory purposes but not address the other two, or alternatively, may be important to support the functioning of the regulatory program as a whole, but not be focused on any of the identified purposes.

The Agency does not agree with the comments that requirements for reclaimed refrigerants by subsector are market manipulation. Entities within in these subsectors are able to purchase reclaimed HFC refrigerants from whichever supplier or reclaimer they choose, just as they could for virgin refrigerants. EPA discusses the estimated demand and supply of reclaimed HFCs for the affected RACHP subsectors in greater detail in other comment responses in this section, but notes here that EPA estimates that the supply of reclaimed HFCs will be sufficient for the demand anticipated for the servicing and/or repair of refrigerant-containing equipment in the affected RACHP subsectors. The Agency also describes elsewhere in this preamble that reclaimed HFCs are required to meet the same purity standards as virgin HFCs and must be verified to meet those standards by specified analytical methods. Thus, entities within the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors can continue to purchase refrigerants for servicing and/or repair of equipment. Further, as EPA explains in another comment response in this section, EPA is not aware of market data or trends signifying that reclaimed HFCs are more expensive than virgin HFCs. The Agency received a comment on its NODA (87 FR 62843, October 17, 2022) stating that prices for reclaimed HFCs and virgin HFCs are generally equivalent.[99] Nonetheless, for conservative purposes, the analysis in the Economic Impact and Benefits TSD assumes a ten percent premium for reclaimed refrigerant, and we also included a sensitivity analysis where costs are equivalent. With these considerations, the Agency does not view the subsector approach as market manipulation.

Further, these requirements are a reasonable approach to implementing aspects of subsection (h)(1). Among other things, subsection (h)(1) of the AIM Act directs the Agency to establish regulations to control, where appropriate, practices, processes, or activities regarding the servicing or repair of equipment that involves a regulated substance or the reclaiming of a regulated substance used as a refrigerant. EPA interprets subsection (h)(1) to authorize this type of provision to require reclaimed HFCs in the servicing and/or repair of certain equipment in certain subsectors. The requirements in this rulemaking to control the servicing and/or repair of certain refrigerant-containing equipment are within this authority and support the purpose of maximizing reclaim of HFCs. Further, EPA's decision to apply these requirements only to refrigerant-containing equipment in particular RACHP subsectors is based on consideration of where such controls are ''appropriate,'' as the availability of reclaimed HFCs may not be prepared to support such requirements for all existing RACHP equipment by the compliance date. By requiring that servicing and/or repair of certain refrigerant-containing equipment be done with reclaimed HFCs by a certain time frame, these requirements provide some predictability in the market, which is expected to encourage efforts to increase capacity for reclamation and support recovery of HFCs.

Comment: EPA received many comments regarding the availability of the supply of reclaimed refrigerant to meet the required uses of reclaimed HFC refrigerant as proposed. A few commenters claimed that the reclaim rate will not increase to meet demand and that EPA has not provided sufficient data to support the availability of necessary reclaim material for the regulated sectors. The commenters stated that even if HFC reclamation continued to grow at 38 percent every year, supply would barely provide half of the quantity needed in 2028. One commenter stated that not enough recovery machines are sold in the United States to support the reclaim mandate, thus leading to insufficient refrigerant recovery and reclamation. The commenter claimed that this resulting refrigerant shortfall will drive up costs. Another commenter noted that the inadequate supply of reclaimed gas would mean that the reclaim mandates are consequently unlikely to be practical, achievable, or enforceable. Another commenter was skeptical that enough reclaimed refrigerant will be available in the market by 2028 and claimed that the rulemaking record does not support that a sufficient quantity will be available. One commenter stated that only four percent of 2022 demand for R–410A was reclaimed in 2022. The commenter further stated that new systems need to be installed in order to realize the transition to lower-GWP refrigerants and that there will be a lack of recovered refrigerant from new technologies using lower-GWP refrigerants until equipment approaches retirement. The commenter also claimed that including equipment meeting Technology Transitions GWP limits would complicate the reclamation process. The commenter claimed that this approach is consistent with the statutory design of the AIM Act by allowing the phasedown to move at its prescribed pace while accommodating sector and subsector-specific restrictions and avoiding potential disruptive market effects. Another commenter stated that current low recovery and reclamation volumes and a lack of market readiness do not support establishing reclaim mandates but, if EPA proceeds, such requirements should require use equal to reasonable market supply projections. Another commenter stated the challenge of obtaining a sufficient amount of recovered refrigerant available to reclaim and stated that any provisions to minimize releases should be balanced such that adequate supply of refrigerant is available.

A couple of other commenters stated that EPA has not evaluated reclaim availability on a sector-specific basis, instead, assuming that the availability for each reclaimed HFC will increase consistently across all HFC blends. The commenters stated that EPA needs to look at HFC blends in each sector because certain blends are hard to recover and are end-use specific. The commenters stated that R–404A and R–507 are two examples of refrigerants that are difficult and expensive to reclaim and that many reclaimers cannot reclaim these blends or would choose not to, leading to insufficient supply and refrigeration problems.

Another commenter expressed concerns regarding the future market availability and price of certified reclaim such as that of R–410A because there are no ''drop in'' substitutes to replace it. The commenter stated that this is very different from EPA's most recent 2010 refrigerant transition in the stationary air conditioning and heat pump market where there were alternatives for HCFC–22; thus, industry had options that they do not have in this transition. The commenter noted this could create unforeseen shortages unless EPA takes actions to ensure reclaim mandates are based on actual data and are focused on the service market. The commenter expressed concerns that EPA's future projected reclaim quantities will not be sufficient to meet actual market demand for both initial charge as well as service/

[99] See comment number EPA–HQ–OAR–2022–0606–0009.

aftermarket demand and thus encouraged EPA to focus on the service/aftermarket and remove the initial charge mandates from the proposed rule.

Another commenter stated that the challenge of providing sufficient reclaimed HFCs to maintain HVACR systems is not the reclamation capacity of reclaimers but rather obtaining sufficient recovered HFCs. The commenter claimed that regulations increasing demand for HFCs or adding costs to reclamation would exacerbate the situation. The commenter pointed to the fact that most manufacturers have typically mandated virgin refrigerants in new applications and that the reclaim mandate in the proposed rule upends this. The commenter noted that some in the industry anticipate that HFC availability will drop significantly following the 2024 phasedown step of a 30 percent reduction, motivating the use of less refrigerants. The commenter stated that only one percent of the expected 2028 HFC market requirements are currently recovered, that it is not clear how this will satisfy the 85 percent requirement for new system charging, and that consumers will still demand that systems function even if there is insufficient supply. The commenter acknowledged that moving to alternate refrigerants will take some pressure off the HFC demand but stated that very little new A2L product is entering the market. The commenter stated that ramping up significant transition by the end of 2024 looks to be very challenging and questioned whether there will be enough relief in the HFC supply by 2028.

One commenter stated that contrary to EPA's suggestion in the preamble to the proposed rule that HFC reclamation is increasing, the reclamation sector is experiencing significant structural, market, and regulatory challenges that have limited refrigerant reclamation's growth in the United States over the past decade. The commenter asserted that despite expectations of an increase in reclamation volumes, the overall data indicate a decrease, with 2018 yielding 18.1 million pounds per year, and even with the slight rise in HFCs in 2022, the total weight amounted to 15.4 million pounds for the same year. However, the commenter also stated that this rule, once finalized and implemented, could catalyze a substantial shift, resulting in the HFC reclamation market growing tenfold by 2032. The commenter stated that the reclamation volumes that EPA foresees are highly attainable by 2028, due to the effectiveness of the AIM Act hinging not on the capabilities of U.S. reclaimers, but on overcoming structural barriers in refrigerant pricing to establish a genuine circular economy for refrigerants, where reclamation stands as the low-cost solution.

A few commenters suggested that EPA formulate alternatives to the proposed reclaim provisions and align with more realistic expectations and assumptions. Both commenters stressed the following two principles: basing reclaim mandates on relevant data to ensure practicality and phasing in reclaim mandates on a gradual basis. These commenters recommended that EPA establish a process to review data on the projected availability of reclaimed refrigerant and adjust requirements for the following year as needed. One commenter recommended that EPA use a data driven approach to set reclaim mandate requirements using a lagging model where future mandate amounts depend on actual reclaim production amount. The commenter stated that such a lagging model would allow EPA to mandate higher reclaim if recovery rates increase but also avoid market disruption. Two commenters recommended that EPA actively engage with industry stakeholders to gather comprehensive data on reclaim infrastructure capacity, available refrigerant types and quantities, and market demand across different sectors to provide a solid foundation for a more effective and efficient regulatory framework. One commenter recommended that EPA revisit reclaimed HFC data and adjust requirements based on real-world feasibility. Another commenter stated that the Agency may consider other mechanisms within its authority to increase reclamation. Another commenter urged EPA to conduct further analysis on a refrigerant-by-refrigerant basis to ensure there will be enough used refrigerant available for reclaimers to process to support the volume of reclaim needed by January 1, 2028.

Another commenter suggested that EPA may wish to consider collecting information on the total amount of refrigerant recovered compared to the total amount purchased by various entities as well as the percentage of the total amount purchased that is used for installation of new equipment compared to the total amount used to top up leaks. The commenter suggested that EPA may wish to interview CARB and OEMs as to the successes and challenges associated with the R4 Program to learn from the largest experiment of its kind in the United States, which appears to have resulted in an increase in R–410A reclaim by as much as approximately 500 metric tons from 2021 to 2022. The commenter noted that CARB allowed for an alternate compliance pathway of "Early Action" to transition to a low-GWP refrigerant prior to 2025, meaning that not all OEMs were required to participate, which may be reflected in the slight increase in reclaimed refrigerant reported to EPA.

Response: EPA acknowledges these comments related to the supply of reclaimed HFCs to support the requirements for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs established in this rulemaking. EPA understands the need for increasing recovery of refrigerants and ensuring that these refrigerants are provided to reclaimers for subsequent reclamation. The Agency took advanced comments on technician certification and in a future proposal could consider the relationship between technician certification and recovery. The Agency has taken into consideration, in this rule, requirements for reclaimed HFCs and expects these regulations will provide market signals that will support increased recovery of HFC refrigerants becoming available for reclamation, and will support reclaimers increasing the amount of reclaimed refrigerants available to meet the increased demand. The Economic Impact and Benefits TSD does not include increased recovery in the base case for this rule based on the assumptions for that scenario; however, EPA did consider an alternate scenario with increased recovery and anticipates that the reclamation provisions could support increased recovery during servicing or disposal where the refrigerant may otherwise have been vented or released. EPA also acknowledges comments describing a need to evaluate data related to the requirements for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs. In this rulemaking, EPA is making modifications to the proposed approach and finalizing provisions based on additional consideration of these challenges and needs, as described in the following paragraphs.

First, the Agency is not at this time establishing requirements for the initial fill of refrigerant-containing equipment with reclaimed HFCs. The Agency understands concerns related to reclaiming newer refrigerant blends that are more recently being used in equipment and comply with the restrictions established in the 2023 Technology Transitions Rule. Because EPA is not finalizing the proposed requirements for initial fill with reclaimed HFCs at this time, the concerns in comments related to HFC

refrigerants used in the first fill of refrigerant-containing equipment to comply with the 2023 Technology Transitions Rule are not implicated in this final rule. The Agency also notes that it is not finalizing any exclusions based on GWP for other provisions in this rule related to servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs, as discussed in another comment response in this section.

Second, under the requirements finalized in this rule, the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs covers a narrower scope of RACHP subsectors than in the proposal. EPA is finalizing these requirements for supermarket systems, refrigerated transport, and automatic commercial icemakers. EPA is not, at this time finalizing these provisions for stand-alone retail food refrigeration equipment; however, the narrower scope of the provisions finalized in this rulemaking does not have much impact on EPA's analysis of the supply of reclaimed refrigerants, given in part that in many cases this equipment is hermetically sealed and less likely to have field repairs in the same way as field-charged equipment. The draft Economic Impact and Benefits TSD accompanying the proposal estimated that demand for reclaimed HFCs in the servicing and/or repair of refrigerant-containing equipment in the stand-alone retail food refrigeration equipment subsector in 2028 was approximately 20 metric tons, with about 80 percent being HFC–134a. EPA notes that the analysis provided for the proposal did not take into account effects of the 2023 Technology Transitions Rule, as the rule was not yet finalized when this proposal was issued. The 20 metric tons of reclaimed HFCs for servicing and/or repair in the stand-alone retail food refrigeration subsector is minor relative to the estimated demand for reclaimed HFCs in the servicing and/or repair of the other three RACHP subsectors, which was estimated at 12,168 metric tons. While not finalizing at this time, the requirements for servicing and/or repair with reclaimed HFCs in the stand-alone retail food refrigeration subsector only alleviates a small amount of needed supply in 2029. EPA discusses anticipated supply relative to estimated demand with the updated analyses in another comment response and notes that anticipated supply is expected to meet the estimated demand. Further, EPA is focusing these requirements in the final rule on servicing and/or repair of certain existing refrigerant-containing equipment that use HFC refrigerants that are currently being reclaimed. EPA understands that a significant portion of recovered and reclaimed refrigerants is sourced when refrigerant is recovered at a piece of equipment's EOL. The types of refrigerant-containing equipment affected by these provisions are those that are currently existing and in-use; thus, the installed stock of refrigerants to continue to support the useful life of these types of refrigerant-containing equipment will be supported as older ones reach their EOL. The Economic Impact and Benefits TSD accompanying this rulemaking provides additional analysis of the existing stock of HFCs by type of refrigerant-containing equipment. Accordingly, under the provisions in this final rule, resources can be focused on providing reclaimed HFCs for servicing and/or repair of existing refrigerant-containing equipment in certain RACHP subsectors, where there is a greater ability to obtain recovered refrigerants from equipment that is at its EOL.

Third, EPA is delaying the compliance date for these provisions by one year to January 1, 2029. This delay of the compliance date should enable reclaimers to increase their supply of reclaimed refrigerants to meet demand for servicing and or repair of equipment in the covered subsectors. EPA notes this date aligns with the next major phasedown step of production and consumption of virgin HFCs under the AIM Act, when reclaimed HFCs will play an even greater role in supporting the servicing and repair of existing equipment. Further, EPA is aware of examples from reclaimers that are actively building capacity of advanced separation technologies.[100] EPA acknowledges comments related to suggestions for phasing in these requirements; however, the Agency is not finalizing such a method for these requirements, for the reasons discussed in another comment and response in this section.

Finally, EPA is establishing a discrete reporting requirement to better understand the sale, distribution, and availability of reclaimed HFCs in the subsectors covered in this rulemaking. As described in this section, EPA is requiring reporting by reclaimers and distributors that contain information on the volumes of reclaimed HFCs sold and intended for servicing and/or repair of equipment in the covered subsectors. EPA is establishing a two-time reporting requirement to gather this information and better understand the landscape for reclaimed HFC availability for these subsectors in 2026 and 2027 (reports must be submitted by February 14, 2027, and February 14, 2028, respectively), leading up to the compliance date of January 1, 2029. EPA notes that the Agency will review this information and may consider proposing changes to the requirements for reclaimed HFCs, if warranted.

EPA acknowledges the comments related to assessing particular blends and subsectors as related to reclaimed HFC refrigerant availability. EPA considered this in the report *"Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices,"* available in the docket for this rule and evaluated the anticipated demand of HFCs in the covered subsectors. Among the covered RACHP subsectors in this rule, the most anticipated demand HFC and HFC blend refrigerants are HFC–134a, R–404A, R–407A, and R–507. Related to R–404A and R–507, the Agency understands the uses of these particular blends in each of the covered subsectors of this rulemaking. Even if the commenters were correct about the current costs and difficulties sourcing these refrigerants today, EPA notes that these blends are currently being reclaimed, and the Agency anticipates this rulemaking to provide market signals to reclaimers to increase reclamation of these blends and secure additional recovered materials. Similarly, EPA anticipates those recovering HFCs from equipment will be aware of reclaimers' increased need for such materials and will increasingly develop arrangements to provide recovered HFCs to reclaimers. R–404A, in particular, has had a steady volume of reclamation between approximately 400,000 and 500,000 pounds each year from 2017 to 2022 with a larger increase upwards of 800,000 pounds in 2023.[101] While specific data on R–507 reclamation are not published, reclamation volumes of R–507 between 2017 and 2023, as reported to EPA, have been steady between approximately 40,000 and 130,000 pounds each year. EPA reiterates that the Agency is only finalizing requirements for the servicing and/or repair of refrigerant-containing equipment to be done with reclaimed HFCs in a limited number of RACHP subsectors.

The Economic Impact and Benefits TSD estimates that approximately 12,168 metric tons (26.8 million

[100] A-Gas (2023). A-Gas Breaks Ground on Additional Market-Leading Refrigerant Separation Technology. Available at: *https://www.agas.com/news-insights/a-gas-breaks-ground-on-additional-market-leading-refrigerant-separation-technology/.*

[101] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

pounds) [102] of reclaimed HFCs will be needed to meet this demand in 2029 and that this amount will decline in future years due to the transitions to lower-GWP refrigerants under the 2023 Technology Transitions rule. The Agency anticipates increased rates of reclamation of recovered refrigerants as the phasedown continues. EPA also notes that there are several options available to reclaimers, including reclaiming the blends themselves, reclaiming individual HFCs that can be combined to form specific blends, and separating blends into individual components to meet demand of specific refrigerants. EPA also notes that in some cases, reclaimers may plan to stockpile recovered HFCs ahead of the AIM Act phasedown milestone in 2029. Stockpiling both virgin and reclaimed refrigerants ahead of phasedown steps has been a common practice both with regards to the ODS phaseout and thus far with implementation of the HFC phasedown.

EPA does not assume that all HFCs are recovered and reclaimed. For example, some HFCs are used in other sectors, such as foams or aerosols, where the HFCs are not typically recovered or their use is, by nature, emissive, respectively. Further, HFCs in refrigerant-containing equipment may leak, reducing the amount that is recoverable at the piece of equipment's EOL. In the Economic Impact and Benefits TSD, EPA estimates in 2029, that the amount of HFC refrigerants available to be recovered (after accounting for the factors above) from refrigerant-containing equipment will be 35,458 metric tons (78.2 million pounds). If all HFC refrigerants available for recovery in refrigerant-containing equipment are in fact recovered and reclaimed, EPA notes that this amount represents nearly three times the estimated servicing demand of reclaimed HFCs for refrigerant-containing equipment in the affected subsectors in 2029. However, even if a substantially lower share (*e.g.,* approximately one third) of what is available for recovery in a given year is actually reclaimed, sufficient amounts of reclaimed refrigerant would be available to meet the rule's requirements. Further, this assessment does not consider the amount of recoverable HFC refrigerants that are available in the years leading up to 2029. EPA understands that it is common practice for reclaimers to stockpile recovered refrigerants and reclaim them when most efficient or opportune. Thus, EPA anticipates that reclaimers will be securing sufficient amounts of recovered HFC refrigerants to reclaim to meet the estimated demand in 2029. EPA also expects that the HFC reclamation market will increase in future years as more refrigeration and air conditioning equipment using HFC refrigerants reach their EOL, and more HFCs are potentially available for recovery and reclamation. CAA title VI prohibited the use of HCFC–22 in new air conditioning and refrigeration equipment starting in 2010, facilitating manufacturers to transition to use ODS substitutes—including, HFCs. That market shift nearly 15 years ago means that today we are just starting to see certain HFC-containing equipment reach its EOL. Going forward, we will see an increased amount of HFC-containing equipment reach its EOL, which will impact the amount of HFCs available for recovery. EPA also notes that the Agency is establishing a two-time reporting requirement to gather information and better understand the landscape for reclaimed HFC availability for the affected RACHP subsectors in 2026 and 2027, leading up to the compliance date of January 1, 2029. The Agency will review this information and may consider proposing changes to the requirements for reclaimed HFCs, if warranted.

EPA notes that the amount of reclaimed HFCs increased over 40 percent from 2021 to 2022 and increased a further 20 percent from 2022 to 2023.[103] These year-over-year increases may suggest that the reclamation market for HFCs is continually becoming more robust. EPA included an analysis of recent trends in reclamation totals and anticipated growth related to the requirements in this final rule in the report available in the docket of this action, *Analysis of the U.S. Hydrofluorocarbon Reclamation Market: Stakeholders, Drivers, and Practices.* The analysis finds that even assuming a linear and conservative growth trajectory, reclamation totals approach the expected demand for 2029. However, EPA notes that reclamation totals in reality are unlikely to follow a linear growth trend, and that growth in capacity may increase at a significantly higher rate due to the provisions in this rule and other factors, such as new reclamation facilities coming online.[104] EPA notes that the year-over-year increases in 2022 and 2023 are absent additional regulations to maximize reclamation, which this rule is establishing. EPA also notes that the phasedown may have had some effect on this increase; for example, the increases in reclamation data as reported to EPA in 2022 and 2023 were likely linked to overall awareness and reaction to the AIM Act and, more recently, the increase in 2023 may be in anticipation of the phasedown step in 2024. These effects may be observed as related to the overall phasedown; however, the regulations established in this rule are necessary to maximize reclamation of HFCs throughout the course of the phasedown and beyond. EPA also notes, as stated above, that the Agency is establishing a two-time reporting requirement to gather information and better understand the landscape for reclaimed HFC availability for the affected RACHP subsectors in 2026 and 2027, leading up to the compliance date of January 1, 2029. The Agency will review this information and may consider proposing changes to the requirements for reclaimed HFCs, if warranted.

EPA also acknowledges comments related to outreach and engaging with industry stakeholders to gather data and information. As noted in section IV.E, EPA provided multiple opportunities for engagement for this rulemaking. Among those opportunities include the publication of a NODA with a public comment period, a public stakeholder meeting, and a public webinar. Further, EPA provided notice and an opportunity for public comment on the proposed rule, and has considered those comments in this final rule, as appropriate.

Regarding the commenter's statement that allowance use for virgin HFCs could potentially shift to other subsectors as requirements for reclaimed HFCs come into effect for the subsectors covered in this rulemaking, EPA responds that as the phasedown continues, EPA anticipates market shifts that could include changes in the production and consumption of certain HFCs and changes in the use patterns with reclaimed HFCs replacing virgin HFCs. EPA further notes that under the phasedown schedule established in subsection (e)(2)(C) of the Act, in the last step of the phasedown HFC production and consumption allowances equal to 15 percent of the

[102] This estimate is based only on demand and does not take into account that reclaimed refrigerants may contain up to 15 percent virgin HFCs, by weight. See Appendix D in the Economic Impact and Benefits TSD for more information.

[103] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

[104] A-Gas (2023). A-Gas Breaks Ground on Additional Market-Leading Refrigerant Separation Technology. Available at: *https://www.agas.com/news-insights/a-gas-breaks-ground-on-additional-market-leading-refrigerant-separation-technology/.*

respective baselines will continue to be available indefinitely. The Agency assumes applications that are difficult to transition and/or applications requiring higher purity HFCs may continue to require virgin HFCs into the future. While the Agency acknowledges that there will be shifting business practices given the HFC phasedown, the 2023 Technology Transitions Rule, and this final rule that will increase the reliance on reclaimed HFCs especially for servicing RACHP and fire suppression equipment, there are business practices including patents and licensing arrangements that could affect the ability of certain reclaimers to supply certain customers with reclaimed HFCs. The Agency anticipates that as patents expire and licensing arrangements expand, these limitations will lessen. EPA reiterates that the requirements in this rule only apply to servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in three RACHP subsectors. Further, the compliance date for these requirements is January 1, 2029, which should give industry sufficient time to adjust current business practices.

EPA acknowledges the concerns of the commenters regarding challenges facing the reclamation industry and the Agency responds that several of the provisions established in this rulemaking are designed to support increased reclamation. These provisions focus specifically on the maximizing of reclaiming HFCs, consistent with one of the purposes identified in subsection (h)(1) of in the AIM Act. Per reported data for reclaimed refrigerants, the total amount of reclaimed refrigerant (ODS and HFCs) was 14.7 million pounds in 2018 and 14.2 million pounds in 2022.[105] The commenter is correct that the total amount was reduced, considering both ODS and HFCs together. However, as noted, this rulemaking is focused on increasing reclamation of regulated substances (*i.e.,* HFCs), and HFC reclamation increased from 5.25 million pounds in 2018 to 7.6 million pounds in 2022, an increase of over 40 percent. EPA anticipates this trend to increase related to the provisions established in this rulemaking as well as the overall phasedown and increasingly limited supply of virgin HFCs.

EPA acknowledges the comment on collecting information on amount of refrigerant recovered. The information suggested by the commenter related to total refrigerant recovered to compare to the amounts purchased by entities (identified by use in first fill, servicing, etc.) may be useful to understanding trends in refrigerant recovery. Such data may also be helpful in understanding how refrigerant is recovered and recycled in equipment (whether it be the same piece of equipment or another piece of equipment under the same ownership). However, EPA did not propose such information collection, which would require additional reporting by various entities in the supply chain, and notably, reporting from certified technicians performing the actual recovery and servicing and/or repair activities. Further, EPA recognizes the important role technicians play in recovering refrigerant destined for reclamation and that it may be useful to have such information collected; however, the Agency did not propose and is not finalizing recordkeeping or reporting requirements for certified technicians to collect information on the total refrigerants they recover in this rulemaking. However, the Agency notes that it may consider proposing information collection requirements on recovered refrigerant, such as recordkeeping and reporting for technicians on the amount of refrigerant recovered in a future rulemaking. For example, this suggestion could warrant additional consideration in a potential future rulemaking where the role of technician certification programs is considered more fully.

EPA notes that under current reporting for certified reclaimers per 40 CFR 82.164, reclaimers are required to report on the annual totals of refrigerants they receive. EPA notes the value of reporting on a more granular level, however. As noted previously in this response, EPA is establishing discrete reporting requirements to better understand the availability of reclaimed refrigerants in the covered subsectors prior to the compliance date for these requirements.

The Agency also notes that in issuing the proposed rule and reviewing comments in development of this final rule, we reviewed information on the R4 Program, including a review of the State agency's statement of reasons related to establishing such a program. EPA found this to be a useful source of information. EPA notes that the data presented by the commenter alluding to the increase in R–410A reclamation from 2021 to 2022 reference EPA's published data on reclamation totals as reported under EPA's CAA section 608 regulations.[106] The total increase in R–410A reclamation from 2021 to 2022 was approximately 1.04 million pounds (520 tons). While this increase was greater than previous years' trends, EPA did not explicitly discuss with CARB the use of the early action pathway related to the State's R4 Program. This program may have contributed to the increase in reclamation of R–410A from 2021 to 2022; however, the Agency is also aware that reclaimers have been building additional capacity and notes that increased reclamation could also be a result of other factors, such as the progression of the HFC phasedown. For example, the reclamation of HFC–134a also saw a significant increase from 2021 to 2022 of approximately 473,000 pounds (237 tons). Further, the CARB R4 Program is applied at the State level and this rulemaking applies at the national level and thus, considers the availability of reclaimed HFCs nationwide. Entities may choose to service and/or repair their refrigerant-containing equipment with reclaimed HFCs prior to the compliance dates. The compliance dates for this rule were informed by analysis (*e.g.,* assessing the estimated demand of reclaimed HFCs) and consideration of comments received on the proposed rule, and they allow the reclamation industry to provide sufficient supply for servicing and/or repair of refrigerant-containing equipment in the affected RACHP subsectors with reclaimed HFCs. With these considerations, the Agency is not establishing an early action option for compliance at this time.

Comment: One commenter noted that the reclaim industry has already reached a large scale of reclaimable refrigerant even though there was no Congressional mandate to reclaim this product and the public was generally unaware of the negative environmental effects associated with HFC refrigerant emissions. The commenter stated that EPA can meet its 100 percent reclaim usage goals through rapid scaling of recovery rates for HFC refrigerants under the AIM Act which has already given HFCs high economic value. The commenter suggested that the refrigerant in the installed base aftermarket and in equipment approaching its EOL will both coincide well with recovery opportunities. The commenter stated that the servicing sector, specifically the contractors, is the only real material source for increasing the amount of reclaimed refrigerants, which if recovered more consistently will lead to the corresponding growth in reclamation necessary for an orderly transition under the AIM Act. The commenter also

[105] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

[106] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

noted that mandating reclaimed HFCs in the servicing sector would encourage more recovery by contractors and that this approach incentivizes contractors to provide more recovered refrigerant to reclaimers to ensure access to reclaimed refrigerant to service consumers' needs.

Response: EPA acknowledges this comment. EPA agrees that scaling up HFC refrigerant recovery and reclamation may become increasingly important, particularly as a business strategy, as HFCs are phased down and appreciates efforts that have already been made, including those made prior to the enactment of the AIM Act. EPA acknowledges the role of the technicians and contractors in the overall recovery of refrigerant, especially as equipment reaches its EOL. The Agency is aware of a range of programs, including those with incentives, that have been used by OEMs and reclaimers to support recovery of refrigerants.

Comment: One commenter stated that requiring reclaimed HFCs for servicing is largely untrialed in the United States and needs gradual testing and iteration. The commenter mentioned that California is currently in the first year of implementation of its R4 Program, which requires OEMs for residential AC and VRF systems to use specific calculated reclamation volumes in 2023 and 2024. The commenter noted that since the inaugural year of the program has not yet concluded, comprehensive data and conclusive findings regarding the program's efficacy and success are currently unavailable to the broader stakeholder community to inform the formulation of a national reclaim requirement rule.

Response: EPA disagrees that reliance on reclaimed refrigerants is untrialed in the servicing sectors. As discussed elsewhere in this final rule, the Agency notes that since 2020, reclaimed HCFC–22 is the only viable option for servicing legacy HCFC–22 systems. Similarly, for the CFC systems, this has been the case since the 1990s. The Agency also notes that the amount of reclaimed HFCs has been reported annually to EPA since 2017 and that the amount has been increasing. Reclaimers are selling reclaimed HFCs and competing with virgin HFCs in many markets particularly for servicing certain RACHP and fire suppression equipment. The Agency proposed and is finalizing a program that is markedly different from the R4 Program. Further, the Agency will be interested in any data California will be able to share; however, the Agency does not need those data to finalize a reclamation program under subsection (h).

Comment: Many commenters discussed the demand and supply of relevant refrigerated blends for servicing, especially R–410A. One commenter stated that EPA's mandate for reclaimed HFCs, when combined with the 2023 Technology Transitions Rule, will likely drive perverse commercial practices to meet this demand because companies will be incentivized by EPA's rules to take usable, reclaimed R–410A and separate out the HFC–32 from the HFC–125 in order to make reclaimed HFC–32. The commenter claimed that not only would this be counterproductive to meeting demand for reclaimed R–410A service gas for that equipment base, but it would also require unnecessary energy consumption from the distillation process. In addition, the commenter stated that the stranded HFC–125 ultimately would simply be re-blended with virgin HFC–32 to make R–410A to be sold to subsectors that are not subject to the reclaim mandate, creating a repetitive and unproductive loop.

Additionally, a commenter stated that separating individual HFC refrigerants from recovered refrigerant mixtures, such as R–410A, R–404A, and the R–407 series, is not necessary because the demand for such reclaimed refrigerant mixtures particularly for service will be high and would in fact be an environmental detriment due to the high energy consumption required for the separation process.

An additional commenter stated that the HFC market would be disrupted by the requirements described in the NPRM and noted that reclamation currently services at best less than nine percent of the expected 2028 demand. The commenter additionally stated that the proposed rule does not explain how the reclamation industry will achieve the necessary growth and that even achieving growth at a rate of 38 percent (*i.e.,* the growth from 2021 to 2022) would not supply a sufficient quantity of reclaimed HFCs. The commenter claimed that the disconnect between supply and demand would be even wider than this because of highly mixed refrigerants, which require advanced fractional distillation, technical expertise, and high capital costs. The commenter provided an example for HFC–32, estimating that HFC–32 reclamation in 2022 represented 2.4 percent of what will be needed in 2028. The commenter further claimed that, given that HFC–32 units will not be available to be reclaimed in significant quantity for 15–20 years, reclaimers may try to reclaim mildly flammable HFC–32 from R–410A. The commenter noted that R–410A is azeotropic and therefore requires significant energy to separate, that it requires investments in equipment due to HFC–32's mild flammability, and that there would only be a limited market for the HFC–125 that remained. The commenter concluded that there is therefore a mismatch between HFC–32 demand and supply of reclaimed material and that the weight of the reclaim requirement would fall on the HFC–32 producer. Another commenter noted that they currently use fractional distillation to separate HFC–32 from recovered refrigerant blends to ensure purity that meets or exceeds the AHRI 700 standard for the product. The commenter claimed that sustaining adequate HFC–32 supplies to 2029 and beyond is crucial to ensure equipment operation until the EOL because its GWP is below certain thresholds established in the 2023 Technology Transitions Rule.

Another commenter claimed that EPA's reclaim requirements ignore how refrigerant is recovered. The commenter stated that refrigerant is recovered when equipment is replaced, retrofitted, or retired, and that given the long lag times between when new equipment is installed and when equipment is replaced or retired, the large increase in R–410A reclamation that occurred from 2021 to 2022 could be due to R–410A equipment that was installed in 2010 and reached its EOL, and that a large annual increase in R–410A reclamation is not foreseeable based on existing data. The commenter claimed that EPA should model reclaim supply based on the installed base of refrigerants, estimated by yearly turnover and estimated recovery efficiency. The commenter modeled the R–410A installed base using AHRI shipment data for RACHP from 2008 to 2022 and provided an attachment with modeled data to support its argument. The commenter used these data to assert that the growth in reclamation of R–410A in 2022 was expected, because there was an increase in new units using R–410A in 2010 compared to 2009. Furthermore, the commenter stated that it considered the equipment mix when factoring in future reclamation numbers of R–410A, as well as how refrigerant is recovered.

Another commenter mentioned that the maximum amount of annual ''recoverable'' and subsequently ''reclaimable'' R–410A in 2022 would be approximately 29,000 metric tons or 63 million pounds of R–410A and that the amount of reclaimed R–410A reported to EPA by the reclaimers in 2021 was 2.5 million pounds. The commenter stated it is abundantly clear that there is great scope for improving recovery and reclamation rates for HFCs that

would yield significant climate benefits resulting from preventing those GHGs from being emitted into the atmosphere and reduce the need for supplies of virgin HFCs. The commenter further noted that some may argue that the small quantities of HFCs reclaimed today are evidence that the reclamation market will not be able to meet the demand for reclaimed HFCs under the proposed rule but stated that the current HFC reclamation data reflect the absence of market drivers that will make reclaimed HFCs a valuable commodity. The commenter stated that the amount of R–410A reclaimed in 2022 is nearly 40 percent higher than the previous year and that this is a clear sign that the start of the HFC phasedown and the expectation of regulatory mandates for use of reclaimed HFCs can lead to dramatic, positive shifts in the industry. The commenter also stated that EPA may hear that scaling capacity for advanced fractional distillation reclamation will take time, and that splitting out component gases of azeotropic or near-azeotropic refrigerant blends tends to use more energy than reclaiming blends like R–410A back to their original form without separating out their components. The commenter noted that this may be true; but there is also good reason to encourage the development of a reclamation industry that is capable of splitting mixed gases.

The commenter mentioned that new refrigerants favored by most of the large OEMs are HFC–32 and blends using HFC–32 (*e.g.,* R–454B). The commenter stated that the main source of reclaimed HFC–32 will be recovered R–410A, which is the refrigerant currently used in most RACHP equipment, and that separating HFC–32 out from R–410A is feasible and, if recovery is maximized, as is the intent of the proposed rule, there will be a sufficient quantity of it available to meet the demand. The commenter estimated that there will be a need for approximately 72 million pounds of recovered R–410A and that if recovery of R–410A from retiring equipment is maximized, an estimated 63 million pounds of R–410A would be recovered in 2022. However, the commenter noted that the amount of recoverable R–410A will grow, since the number of retiring systems grows just as the number of new systems does. The commenter estimated the amount of recoverable R–410A in 2028 will be approximately 70 to 74 million pounds, which will be sufficient for meeting the demand for reclaimed HFC–32 in 2028. The commenter noted that there might be challenges, but ultimately, the data suggest that there is a tremendous untapped opportunity for upscaling HFC recovery and reclamation in the United States.

Another commenter stated that 63 million pounds of recovered R–410A could yield 31.5 million pounds of reclaimed HFC–32 for use in the initial charge of new equipment using HFC–32 or other blends mainly composed of HFC–32 and HFOs. The commenter noted that the R–410A available from 2024 to 2027 would also supplement annual amounts recoverable from 2028 onwards.

Another commenter stated that EPA's existing data support the availability of sufficient refrigerant in the aftermarket to meet service sector demand at 100 percent by 2028. The commenter suggested that the total amount of refrigerant available for recovery at EOL is likely in excess of 80 million pounds annually and that based on this estimate, the amount of refrigerant available for recovery via service is sufficient to meet the goals described in the proposed rule. However, the commenter suggested that it will be difficult for EPA to meet their reclaim goals without the consideration of an alternative construction of the reclaim mandate as a servicing mandate based on refrigerant types rather than sectors. The commenter noted that it would be impossible to meet EPA's goal without focusing on the recovery of R–410A, which is predominately used in small outdoor units.

Response: EPA acknowledges these comments and understands the competing interests for reclaiming particular HFC blends as compared to separating out and reclaiming particular components to be used either neat or in other blends. EPA understands that the example of HFC–32 as a component of R–410A is one of the more common scenarios. EPA notes, as described in other responses, that we are finalizing requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors. EPA is not establishing requirements for initial charge with reclaimed HFCs at this time, where the Agency anticipates a majority of HFC–32, blends that include HFC–32, and other blends will be used in the coming years.

EPA acknowledges comments about supply of reclaimed HFCs and those related to driving supply of reclaimed HFCs through the requirements established in this rulemaking. The Agency also notes comments providing specific detail on potential availability of reclaimed refrigerants, and in particular of HFC–32 as sourced from recovered R–410A, and the Agency understands that there is room for improvement in the increase of refrigerant recovery to supply to reclaimers. EPA notes that R–410A comprised about 39.2 percent of the existing installed refrigerant stock by mass in 2022, while other blends such as R–404A, R–407C, and R–507 also make up a significant portion of the 2022 installed refrigerant stock. Reclamation data, as reported to EPA, show that R–410A is also currently the most commonly reclaimed HFC refrigerant in the United States by weight. Annual reclamation data reported to EPA indicates that the annual supply of reclaimed R–410A has increased from about 2,100,000 pounds in 2017 to approximately 4,626,000 pounds in 2023.[107] The Agency provides additional detail on similar comments related to supply of reclaimed refrigerants and provides a response earlier in this section. EPA understands that the significant recent increases in R–410A reclamation could be attributed to refrigerant-containing equipment with R–410A installed in the early 2010s reaching its EOL. The Agency expects this trend to continue, as additional refrigerant-containing equipment with R–410A would be expected to reach their EOL in the coming years as well.

The mix of refrigerants will change over time given the overall phasedown of HFCs, the 2023 Technology Transitions Rule, business decisions, and other factors including demand for more energy efficient equipment. The reclaim requirements help to support the goal of subsection (h) of the AIM Act to maximize reclamation. EPA understands that it may be preferable at times for reclaimed R–410A and/or other reclaimed refrigerant blends not separated to their components EPA considers reclaiming and making available refrigerant blends to be one way to avoid retiring equipment early. However, EPA also acknowledges comments regarding increasingly available capabilities of reclaimers to separate out components from refrigerant blends for individual reclamation or to combine them so as to increase the available supply of a different refrigerant blend. Over time, particularly as the refrigerants used in equipment change, the Agency anticipates seeing movement in this direction. The Agency anticipates that demand will drive reclaimers' decisions concerning reclaiming a blend or separating the blend for its components. EPA previously noted and agrees with

[107] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

comments that HFC–32 reclamation by separating from recovered blends is a current practice. The Agency further acknowledges the need for reclaimers to address safety considerations when handling HFC–32, and other mildly flammable and/or flammable refrigerants particularly if reclaimers choose to use separation technologies. Further, the Agency is establishing alternate RCRA standards for reclamation facilities related to handling flammable refrigerants, as described further in section IV.H of this rulemaking.

As noted, EPA is not establishing requirements for reclaimed HFCs in the initial fill of equipment in certain subsectors in this rulemaking. Therefore, subsectors that may be using HFC–32 or blends that contain HFC–32 could source the refrigerant for initial charge from either virgin or reclaimed supplies.

In the case that recovered R–410A is separated out to its components for their individual reclamation, the Agency disagrees that the HFC–125 would be stranded or only be used for reclaimed R–410A. EPA notes that HFC–125 is used in other HFC refrigerant blends besides R–410A. If HFC–32 reclamation is achieved through separation of recovered R–410A, the remaining HFC–125 could be used in these other blends, including R–404A, the R–407 series, or R–507, which are HFC blends the Agency anticipates will be used in the covered subsectors for the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs. HFC–125 is also a component of several newer refrigerant blends and could be used in the those blends as well.

EPA responds to comments on establishing provisions related to requirements for reclaimed HFCs on a refrigerant basis rather than a subsector basis. The Agency notes that a subsector approach is preferable in this rulemaking, as it avoids cases where there could be shortages of particular reclaimed HFCs or HFC refrigerant blends. The Agency has similarly looked at sectors and subsectors in other parts of this rule (*e.g.,* leak repair thresholds, ALD systems) and in other AIM Act rules (*e.g.,* 2023 Technology Transitions Rule). The Agency considers this approach, sectors and subsectors as a means of setting a level playing field for all participants in that affected sector or subsector.

Comment: Multiple commenters expressed support for phased-in reclamation requirements. One commenter expressed support for EPA's proposed requirements but acknowledged that the supply of reclaimed refrigerant will need to be scaled up quickly to meet the requirements by 2028. To facilitate this transition, the commenter suggested that EPA assist the industry by setting benchmarks and interim targets to ensure that refrigerant recovery and reclamation will expand at the pace and scale needed to support the HFC phasedown. Another commenter strongly agreed with the principle behind requiring use of reclaimed and recycled HFCs and was optimistic about the pace of change in the recovery and reclamation industry. The commenter noted that the benefits of a graduated schedule would outweigh greater reporting requirements, but that the schedule should start sooner than 2028 and ramp up to 100 percent by 2028. The commenter stated that it would be important to boost reclaimed HFC availability before the 2029 HFC phasedown step to fulfill HFC demand. Another commenter proposed using reclaimed refrigerant in the servicing of equipment with the interim goals of 10 percent in 2026, 20 percent in 2027, and 35 percent in 2028 and beyond. Other commenters recommended a gradual phase-in of reclaim requirements based on data for the anticipated need of reclaim on a yearly basis.

Another commenter stated that a gradual step-up/phased-in approach is preferable to reach the 100 percent requirement goal in 2028 for reclaim usage under the proposed rule and it would allow sufficient reclaim supply growth to offset any shortage of available virgin HFCs and avoid market interruption, which is needed for climate mitigation. The commenter stated they expect HFC reclamation to continue to increase and they urged EPA to adopt a step-up/phased-in approach to incentivize HFC recovery and reclamation between now and 2028. The commenter noted that a phased-in approach would incentivize the necessary changed behavior by all involved, especially the contractors, who will need to recover more refrigerants over time to meet the demand for 100 percent reclaim in servicing and repair by 2028. The commenter noted that larger charged systems in the sectors already included in the proposed rule's service/repair mandate typically operate in confined spaces and have greater recovery rates at EOL and servicing when compared to smaller, outdoor systems. The commenter stated that the types of refrigerant systems would include HFC–134a, R–404A, R–407A, R–407C, and R–507 systems, among others. The commenter suggested creating an initial reclaim mandate for servicing these systems starting in 2025 with a lower percentage of 25 percent and then building the requirement overtime to meet the 100 percent reclaim mandate in the proposed rule by 2028. The commenter expressed support for requiring the contractors to report that they are purchasing the proper amount of reclaimed refrigerant as defined in the proposed rule at a minimum on an annual basis to ensure compliance with this mandate. The commenter suggested that servicing of R–410A systems with reclaimed refrigerant might need a slightly longer ramp-up period due to the behavioral change necessary for the contractors that service these R–410A systems. The commenter also suggested a 10 percent mandate for servicing these systems in 2025, increasing to 25 percent in 2026 and then continuing to increase to a 100 percent mandate by 2028.

Another commenter suggested a phased approach for reclaimed HFCs with initial targets based on data and industry feedback to incentivize reclaimed HFC use, which the commenter maintained would better align with the manufacturing process and supply chain realities of both equipment and reclaimed HFCs. The commenter encouraged EPA to revisit the reclaimed HFC data and adjust its approach based on real-world feasibility, considering existing supply chain disruptions and rising costs. The commenter recommended initially prioritizing the reclaim of high-GWP refrigerants and allowing the market to adjust and around 2028 revisiting the need for low-GWP reclaim requirements based on market adoption, performance, technological advancements, and feasibility, starting with 2036 as a potential timeframe.

Two commenters noted that to the extent that EPA adopts a phased-in schedule for these mandates, it should be sector neutral (not sector specific) and differentiated where necessary only on a product-by-product basis. Another commenter noted the reduced HFC supply under the AIM Act step-down and 2023 Technology Transitions Rule and suggested a phased approach that would be coordinated with the 2023 Technology Transitions Rule. The commenter also noted that only a small fraction was reclaimed in 2022 and that significant changes would be required to the entire supply chain to ensure sufficient recovery and reclaim quantities, which takes time.

One commenter noted they would not support a phased approach whereby EPA uses subsector percentages to work

gradually towards 100 percent use of reclaimed HFCs in servicing and/or repair, given the administrative burdens necessary to track and verify compliance that are stated in the proposed rule.

Response: EPA is not establishing a phased-in approach for the requirements for reclaimed HFC refrigerant, though the Agency encourages affected entities to consider increased reliance on reclaimed HFCs ahead of the compliance date. As described above, EPA is finalizing requirements that the servicing and/or repair of refrigerant-containing equipment in three RACHP subsectors be done with reclaimed HFCs with a delayed compliance date of January 1, 2029, but is not at this time finalizing either the proposed requirement for servicing and/or repair with reclaimed HFCs in a fourth subsector or the proposed requirement for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs. The Agency understands the industry identified certain potential benefits to a phased-in approach with limited data to support this approach. The Agency is instead establishing a discrete reporting requirement to better gauge the sale, distribution, and availability of reclaimed HFC refrigerants in the subsectors required to service and/or repair refrigerant-containing equipment with reclaimed HFCs. EPA intends to use these reported data to better assess transitions to reclaimed HFCs in these subsectors and may consider revisiting the timing for the provisions for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs prior to the compliance date, if warranted. While EPA intends to use this reporting to better understand the landscape of reclaimed HFCs in these subsectors, the Agency disagrees with commenters that suggested delaying the timing beyond 2029 (*e.g.*, starting in 2036). Reclaimed HFC refrigerants are already being used and will increasingly play a significant role throughout the entire phasedown, not starting when the phasedown reaches its final step in 2036.

EPA agrees with the importance of increased recovery of refrigerants to support additional reclamation and potential need for changes related to this practice. The provisions in this rulemaking are expected to drive demand for additional recovery. Recovery and sending recovered refrigerants to reclaimers is likely to increase as the value of the recovered HFC refrigerants is more widely appreciated, HFC equipment reaches its EOL, and a reduced amount of virgin HFCs is available as the HFC phasedown continues. EPA notes that many of the transitions to R–410A occurred in response to the 2010 HCFC phasedown step and associated restrictions on the use of HCFC–22 in new equipment. This means that a large amount of R–410A-containing equipment is approaching an expected EOL and this equipment will increasingly be a source of recoverable R–410A. Moreover, EPA disagrees that a required phased-in approach is necessary to cause a shift in behavioral changes and would be more effective than having the requirement begin at 100 percent for reclaimed HFCs in the servicing and/or repair of refrigerant-containing equipment in the covered subsectors.

EPA is establishing the requirements for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs on a subsector basis at this time. The Agency considered and is finalizing in this rulemaking requirements to for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in three RACHP subsectors after further evaluation and informed by comments on a range of factors. Additional discussion on covering more subsectors and on taking a subsector approach are covered in another comment response in this section. The Agency is not establishing requirements for initial fill of refrigerant-containing equipment with reclaimed HFCs in this rulemaking. EPA acknowledged in a previous response on the challenge of securing sufficient reclaimed HFC refrigerants where the refrigerants have not been in the installed stock of equipment for sufficient time and may take a number of years for adequate reclaimed refrigerant to be available.

Comment: One commenter requested that EPA include a force majeure or hardship clause in the rule should the mandated amounts of certified reclaim not be available to regulated entities including OEMs because without such a clause, OEMs and other regulated entities could fall into non-compliance due to no fault of their own. The commenter also requested that EPA provide a mechanism whereby a regulated authority can appeal to EPA for relief should this situation occur. Another commenter stated that the proposed stipulation to utilize recycled or reclaimed substances poses a notable challenge, as the future accessibility of these recycled or reclaimed materials remains entirely uncertain. The commenter stated that complying with the requirement might prove impractical and could result in significant operational delays or business closures. In lieu of these explicit requirements, the commenter strongly urged EPA to incorporate an alternative compliance approach, contingent upon the regulated entity maintaining documented evidence that the requisite recycled or reclaimed substances are unavailable, necessitating the use of virgin products. The commenter stated that this approach aims to offer flexibility in situations where compliance with the primary requirement is unfeasible due to material unavailability.

Response: EPA responds that the Agency is not establishing a force majeure or hardship clause as described by the commenter in this rulemaking. As noted in prior responses, EPA is only finalizing some of the proposed reclamation requirements at this time, is delaying the compliance date, and will use data to assess the uptake of reclaimed HFCs ahead of the compliance date. EPA acknowledges comments related to unforeseen events, which could affect operations at individual facilities that may impact contractual arrangements. However, the Agency does not agree with the need to provide any general regulatory exceptions to remove liability for unforeseeable and unavoidable catastrophes that interrupt the expected course of operations, though the Agency recognizes that there may be value in regulated entities including force majeure clauses in their contracts if the parties to the contract believe such a clause is appropriate.

Comment: Multiple commenters commented on whether lower-GWP refrigerants should be included in reclamation requirements for servicing. Some commenters supported excluding refrigerants with GWPs below the 2023 Technology Transitions thresholds from reclaim requirements. One commenter proposed that EPA should focus on refrigerants with GWPs that are above the GWP limits included in the 2023 Technology Transitions Rule for a final rule. The commenter noted that this change would also focus recovery and reclamation activity on the products with the highest GWP, where reclaim has the most environmental benefit per pound of gas recovered. Another commenter requested that EPA limit the reclaim servicing requirements to HFC refrigerants that are restricted by the 2023 Technology Transition Rule and not all HFCs regulated by the AIM Act. The commenter claimed that many low-GWP HFCs will not be introduced until January 1, 2025, so there will not be enough low-GWP HFCs recovered to generate enough reclaim to use in service for these sectors. Another commenter stated that reclaim mandates

on low-GWP refrigerants do not make sense because these are not in widespread use. In contrast, a different commenter stated that EPA should not exempt low-GWP refrigerants from reclaim mandates and that having reclaim requirements for low-GWP refrigerants will benefit the environment and create a more circular economy.

One commenter urged EPA to provide an exception for certain newer and commonly used low-GWP refrigerants such as R–448A, R–449A, and R–407A, stating that they are unlikely to be reclaimed in sufficient quantity to satisfy industry needs, as these substances have only recently started to be used in newly installed or retrofitted in commercial refrigeration systems. The commenter noted that these refrigerants are subject to patents held by their manufacturers; thus, not all reclaimers can legally formulate their blends, which will constrict supply. Another commenter suggested that the use of reclaimed refrigerant for service and repair of existing supermarket refrigeration appliances starting in 2028 should be limited to refrigerants with GWPs greater than 1,500, if the reclaim mandate as of 2028 is pursued by EPA. Another commenter recommended that EPA prohibit the use of virgin refrigerant for servicing equipment in supermarket systems, cold storage warehouses, refrigerated transport, and automatic commercial icemakers with a GWP greater than 2,200 beginning January 1, 2029, and with a GWP greater than 1,400 beginning January 1, 2034.

Another commenter proposed that a refrigerant supplied for servicing in the applicable sectors that exceeds the established GWP thresholds set forth in the 2023 Technology Transitions Rule could be a specified percentage of reclaimed refrigerant, as determined by the Administrator on an annual and gradually increasing basis. The commenter suggested additional subsectors for consideration for servicing and/or repair requirements with reclaimed refrigerants. An additional commenter suggested EPA review market data and applicable percentages for servicing using reclaimed refrigerant annually via a notice and comment process. The commenter also suggested excluding from servicing requirements any equipment containing a refrigerant with a GWP below the applicable threshold established by the 2023 Technology Transitions Rule.

Another commenter stated that the requirements for reclaimed HFCs cause concerns regarding the excessive burden being placed on the retail industry. The commenter expressed support for the need to incentivize reclaimed refrigerant as a way to balance the decreased supply of HFCs due to the decreased allocation of allowances; however, the commenter expected the focus of reclaim to be on the refrigerants that were not included as future options of the 2023 Technology Transitions Rule. The commenter also expected the focus of the proposed rule to be on the need to service existing equipment throughout its natural lifetime.

One commenter added that heating, ventilation, and air conditioning (HVAC) equipment typically has a lifespan of around 10–15 years, and refrigerant recovery is very limited during this time, with recovery only possible during maintenance and repair work. Therefore, the commenter asserted that after the transition to low-GWP refrigerants in 2025, these low-GWP refrigerants must not become the focus of recovery efforts until 2035 to 2040. The commenter stated that until then, the refrigerant contained in the already installed equipment will be the dominant part of the recovery work. The commenter stated that in the domestic and commercial HVAC sector, R–410A is the main target for recovery as there are no refrigerants below GWP 700 on the market. Therefore, the commenter suggested that it is substantially infeasible to obtain reclaimed refrigerants with a GWP of 700 or less as of 2028.

One commenter stated that there should be no exemptions for newer, lower-GWP refrigerants (such as HFC–32, R–454A/B, R–448A, R–449A, R–450, R–456A, R–444A, or others). Another commenter claimed that there is not enough HFO refrigerant available to support the service and new equipment market and recommended that reclaimed HFC and HCFC makes sense for 2028. The commenter requested further specificity regarding the statement requiring reclaimed refrigerant for repair and servicing.

Response: EPA acknowledges these comments concerning the GWP of refrigerants and basing the provisions for the requirements for reclaimed HFCs with this consideration. Further, EPA understands commenters' suggested rationale of considering reclaimed refrigerant requirements related to GWP limits established in the 2023 Technology Transitions Rule. As noted in previous responses in this section, EPA is not establishing requirements for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs in this rulemaking. EPA understands that many newer refrigerants (*e.g.,* R–448A, R–449A, and R–407A) would be used for the initial fill of new equipment in compliance with the restrictions established in the 2023 Technology Transitions Rule. However, EPA notes that based on reported data from certified reclaimers, newer refrigerants are currently being reclaimed albeit in smaller amounts but as previously noted, those amounts will increase over time. Newer equipment is less likely to require repairs so the amount of newer refrigerants being reclaimed should comport with transition to those refrigerants. Also, as noted above, HFC blends can be separated into components and these components can be used in other blends to the extent patents, licensing agreements, and other business relationships allow. As described above, EPA is establishing a reporting requirement that will further inform the provisions for reclaimed HFC refrigerant use in the covered RACHP subsectors. EPA will use the information in these reports to evaluate these provisions.

EPA is not establishing exclusions based on GWP for the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in this rulemaking. The Agency disagrees with the suggested GWP level of 1,500 on which to base exclusions, noting among other things, that this would exclude HFC–134a, which by volume is currently the second most reclaimed HFC refrigerant, has a GWP of 1,430; thus supply is not tied to that GWP level. In response to comments on GWP considerations of 2,200 in 2029 and 1,400 in 2034, the Agency notes that similar to reasons discussed related to the GWP consideration of 1,500, these suggested cut-offs would exclude HFCs that have significant GWP levels. Regarding a GWP of 2,200, this would exclude HFC–134a, as noted above, and other HFC refrigerants that are currently being reclaimed, including R–407A, R–407C, and R–410A. A GWP-based exclusion of 2,200 would be inappropriate and could discourage the recovery and reclamation of these and other HFC refrigerants and refrigerant blends that will be important to have available per the established requirements for using reclaimed HFC refrigerants in this rulemaking and as the phasedown progresses. Further, the GWP based exclusion at 1,400 would exclude other HFCs, such as R–448A and R–449A which are used in supermarket systems. A GWP cut-off of 1,400 may discourage efforts to recover and reclaim these refrigerants. In response to comments suggesting the GWP of 700 as the cut-off, which is the GWP threshold used for requirements established for certain sectors and

subsectors in the 2023 Technology Transitions Rule, EPA notes differences in the statutory provisions in subsections (h) and (i) and maintains that in this final rule, EPA is promulgating requirements maximizing reclamation.

EPA acknowledges other comments related to not placing GWP-based limits on the reclaimed HFC refrigerant requirements for servicing and/or repair of certain refrigerant-containing equipment and the need to protect the useful lifetime of the equipment. The Agency agrees and effectively designed provisions in this rule to avoid stranding equipment or forced early retirements. The Agency considered the long and successful use of reclaimed refrigerants as well as some of the longstanding concerns reclaimers have raised with market access and acceptability.

As noted in response to other comments, EPA is aware of both patents and certain business arrangements that pertain to certain newer refrigerants and notes the changes between proposal and the final rule.

Comment: Another commenter requested that the reclaim mandate be limited to refrigerants with GWPs greater than 1,500. The commenter stated that it will be very challenging to meet the food retail industry's need for reclaimed R–404A in 2028 and proposed that the mandate be postponed until 2030 at the earliest to avoid the certainty of commercial system shutdowns due to lack of refrigerant for servicing. The commenter stated that while the existing reclaim banks of all HFCs are currently inadequate to meet a servicing tail need in 2028, exempting refrigerants with GWPs less than 1,500 from the reclaim mandate would serve to accelerate retrofits out of high-GWP refrigerants into HFC/HFO blend refrigerants like R–448A and R–449A, which would serve to quickly increase the amount of R–404A and R–507A especially. The commenter further claimed that including refrigerants like R–448A/R–449A in the reclaim mandate would remove all motivation for food retailers to retrofit high-GWP R–404A systems to R–448A or R–449A. The commenter stated that if it is clear when this regulation is finalized if there will be a way to service or maintain existing R–448A or R–449A equipment because if there are no reclaimed refrigerant available, food retailers will immediately stop using these refrigerants, and possibly start using higher-GWP refrigerants that are more likely to have significant banks of refrigerant available for service and maintenance. The commenter also noted that R–448A and R–449A are used today in new appliances, which are unlikely to reach their EOL until 2035–2040 at the earliest. The commenter stated that refrigerant is reclaimed at the EOL, so the only opportunity to establish banks of reclaimed refrigerant is when a new generation of appliances using those refrigerants begin to be retired. The commenter noted that, while it is true that there are older appliance retrofits being carried out that use R–448A and R–449A, retrofitted appliances can be expected to continue to operate at least for an additional 10 years after the retrofit; otherwise, the cost of the retrofit cannot be justified.

Response: EPA responds and refers to the discussion in the previous response of this section related to a GWP-based exclusion for the reclaimed HFC refrigerant requirements at a GWP of 1,500. Further, the Agency notes that the requirement for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs is being delayed by one year to January 1, 2029. EPA also responds, as explained in prior responses, that the Agency is not establishing requirements for the initial fill of certain refrigerant-containing equipment with reclaimed HFCs in this rulemaking. Thus, decreasing the estimated need for supply of reclaimed HFCs needed to meet those provisions and, in particular, the reclaimed HFC or HFC blend refrigerants discussed in this comment.

EPA responds that setting such a GWP limit may have the opposite effect and that by not including all HFC-containing refrigerants based on a GWP limit, there would be less incentive to recover and reclaim these blends. If the requirements were established such that R–448A and R–449A, for example, were exempted from the requirements for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs, there could be less incentive to properly recover these blends for future reclamation. Based on data reported to EPA on reclamation totals, these blends are currently being reclaimed to a degree, as are their components. EPA notes that while these or other newer blends may be under patent, the Agency is aware that, on a global basis,[108] [109] there are certain agreements in place among producers and reclaimers to reclaim certain blends. Further, the Agency notes that it anticipates that with proper maintenance and adherence to the leak repair and ALD requirements, as applicable, in this rulemaking, leaks of HFCs should be minimized, decreasing the need for additional servicing of equipment.

In response to comments related to retrofit, EPA explains that retrofit is considered as a servicing or repair activity in this rulemaking. For the subsectors that are required to service and/or repair of refrigerant-containing equipment with reclaimed HFCs (*i.e.,* supermarket systems, refrigerated transport, and automatic commercial ice makers), retrofits must be done with reclaimed HFC refrigerants if the refrigerant-containing equipment is being retrofitted to use a refrigerant that contains an HFC. Where a piece of refrigerant-containing equipment is being retrofitted to use a substitute for an HFC, reclaimed refrigerant would not be required.

Comment: Two commenters provided comments recommending establishing exemptions from the requirements for reclaimed HFC refrigerant for those applications that receive application-specific allowances under the AIM Act.

Response: EPA responds to these comments related to providing exemptions in cases for which application-specific HFC allowances are provided under subsection (e)(4)(B) of the AIM Act. As discussed in section I.B, EPA is excluding two applications, mission-critical military end uses and on board aerospace fire suppression, from these regulations for a year or years for which the application receives an application-specific allowance as defined at 40 CFR 84.3. EPA is establishing requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFC refrigerants in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors. If mission-critical military end uses and/or on board aerospace fire suppression applications received application-specific allowances for HFCs in a particular year or years, then the exemption would apply.

This rulemaking establishes a definition for ''refrigerant-containing equipment,'' which specifically does not include military equipment used in deployable and expeditionary

[108] Chemours and Honeywell Announce Program to Enable Reclamation and Recycling of Refrigerants in Support of Circular Economy, November 16, 2022, available: *https://www.chemours.com/en/news-media-center/all-news/press-releases/2022/chemours-and-honeywell-announce-program-to-enable-reclamation-and-recycling-of-refrigerants-in-suppo.*

[109] A-Gas Named Authorised Reclaimer of Patent Protected Refrigerants, 2023, available: *https://www.agas.com/uk/news-insights/a-gas-named-authorised-reclaimer-of-patent-protected-refrigerants/.*

situations. Where reclaimed HFC refrigerants are required to be used for servicing and/or repair of certain refrigerant-containing equipment per this rulemaking, the requirements do not apply to the specific case of military equipment used in deployable and expeditionary situations.

Comment: One commenter suggested EPA move the January 1, 2028, compliance date back at least two years to allow for development of the necessary supply of reclaimed HFC refrigerants on the market. Another commenter supported the 2028 timeline for the implementation of reclaimed refrigerants and noted that EPA's firm rulemaking will help make a strong business case for scaling up separation technologies.

Response: EPA acknowledges these comments and responds that the Agency is delaying the compliance date for the requirements for the servicing and/or repair of certain refrigerant-containing equipment to be done with reclaimed HFCs to January 1, 2029. The Agency has reviewed comments and considers January 1, 2029, as an appropriate compliance date. The delayed compliance date provides industry more time to build up capacity of reclaimed HFCs available for these activities and for those in RACHP subsectors required to service and/or repair refrigerant-containing equipment with reclaimed HFCs to establish avenues to obtain the reclaimed HFC refrigerants. A compliance date of January 1, 2029, also aligns with the next major step of the phasedown under the AIM Act when virgin HFC production and consumption will be reduced to 30 percent of the baseline. Reclaimed HFCs will play a crucial role in supporting refrigerant-containing equipment using HFCs as this next step of the phasedown occurs.

Comment: EPA received many comments on the included subsectors for the requirements for use of reclaimed refrigerants for servicing and repair. One commenter recommended that EPA follow the approach taken by California's SB 1206 and implement reclaimed use requirements for all HFC sectors. The commenter stated that CARB adopted a prohibition on the sale, distribution, or other entrance to the market of newly produced bulk high-GWP HFCs, regardless of the sector. The commenter recommended that EPA take this comprehensive approach to establishing requirements for reclaimed HFCs, since it would apply to bulk refrigerant used in all sectors, including retail food applications and non-space conditioning heat pump sectors such as clothes dryers, water heaters, and pool and spa heaters. The commenter also stated that since these technologies are projected to experience rapid adoption in the next decade, if they are not addressed in the 2023 Technology Transitions Rule, these sectors' equipment manufacturers may not be incentivized to transition away from high-GWP refrigerants.

One commenter recommended that EPA include residential air conditioning, light commercial air conditioning, heat pumps, cold storage warehouses, and IPR sectors in the requirements for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs if EPA does not take a comprehensive approach to include all sectors in these requirements. One commenter requested that the proposed prohibition of virgin refrigerant usage for equipment servicing be limited to supermarkets, cold storage warehouses, refrigerated transport, and automatic commercial icemakers. Another commenter noted that many of these subsectors are already transitioning to ultra-low-GWP alternatives for new equipment. The commenter stated that the supermarket sector in particular is anticipated to undergo significant near-term retrofits from high- to low-GWP HFCs, which will make large quantities of retired refrigerant available for reclamation and reuse in the refrigeration servicing market.

One commenter urged EPA to expand the servicing and repair reclamation mandate to additional sectors; specifically light commercial and residential air conditioning and heat pumps. The commenter stated that the inclusion of this sector is essential to any material growth in recovery and reclamation as it has the greatest number of operating units and therefore the greatest number of pounds of refrigerant that can be recovered at EOL. The commenter also suggested expanding the proposed rule to include smaller outdoor units would also increase the amount of reclaim recovered annually. The commenter suggested that EPA should focus the rule on system mandates, as opposed to mandates by sector. The commenter noted that this approach will help contractors better understand the reclaim refrigerant requirements by relying on the type of system and stated refrigerant charge. Moreover, the commenter claimed that, as the lower-GWP systems begin to be installed pursuant to the 2023 Technology Transitions Rule, EPA could then lower its GWP target below 1,000 GWP as stated in this suggested approach and create additional reclaim mandates for the lower-GWP systems. The commenter further stated that, as with the ODS phaseout, using the "worst first" principle creates significant reduction in the earlier years.

Some commenters expressed opposition to EPA's proposed mandate to use reclaimed gas for servicing various subsectors; specifically, the retail food manufacturing and distribution sector. Multiple commenters expressed opposition to EPA's proposed requirements for HFC refrigerant reclaim in the retail food industry and other commercial refrigeration. The commenters stated that the cost of reclaimed HFC refrigerants will not be cheaper than new HFCs. Three commenters claimed that reclaimed HFCs are more expensive than HFCs because reclaimers incur significant equipment and operational costs, including HFC losses during reclamation, equipment upkeep costs, and costs associated with rebalancing refrigerants. One commenter stated that, since some industries are not required to use reclaimed HFC refrigerant, they will procure either new or used HFCs, depending on which is cheaper, so the price of reclaimed HFC refrigerant will always be at least as high as new HFCs. The commenter continued by stating that the proposed requirements will drive demand for reclaimed HFC refrigerant above that of new HFC refrigerant, likely causing them to cost more. Further, the commenter claimed that the use of reclaimed HFCs for equipment servicing and repair may be technically infeasible for custom-built equipment, particularly when upgrading or replacing components. The commenter stated that a limited supply of niche HFCs or blends not manufactured or reclaimed in significant volumes but essential for specific subsectors may also create compliance challenges. The other commenter expressed concerns that the mandate to use reclaimed gas for servicing will strand installed equipment if there is insufficient reclaimed gas to service the equipment. The commenter also noted that any time market supply and demand for a commodity are short, the price of that commodity will increase, and some consumers have to forgo the product, which the commenter stated would be especially unfortunate for equipment owners in the food manufacturing and distribution sectors. The commenter stated that any further disruptions or cost escalations to the food manufacturing and distribution sectors would increase already historically high food costs.

Response: EPA acknowledges these comments related to including additional subsectors in the requirements for using reclaimed HFCs in this rulemaking. At this time, the Agency is finalizing requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors. The Agency is not finalizing requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in the stand-alone retail food refrigeration subsector and is not establishing requirements for the initial fill of refrigerant-containing equipment with reclaimed HFCs in this rulemaking. EPA is removing requirements for reclaimed HFCs in the servicing and/or repair of stand-alone retail food refrigeration equipment in part due to the nature of the equipment. EPA understands that these types of refrigerant-containing equipment are likely hermetically sealed and are less likely to need servicing and/or repair.

EPA is not establishing an approach for requirements to all RACHP subsectors. As described in other responses, EPA considered available supply of reclaimed HFC refrigerants per these requirements. EPA is also establishing a reporting requirement to better assess the use of reclaimed HFCs in the RACHP subsectors covered in this rulemaking to evaluate the requirements in this rulemaking. The Agency acknowledges comments to establish an approach for all subsectors or to include additional subsectors and may consider additional subsectors in a future rulemaking.

EPA disagrees with the assertion that reclaimed HFCs are substantially more expensive than virgin HFCs and is not aware of market data or analyses clearly indicating such a trend. In response to the NODA that the Agency published on October 17, 2022 (87 FR 62843), in which EPA requested comment on current trends on the price of refrigerant, one reclaimer noted: ''The market price for reclaim and virgin are generally equivalent. There is neither a 'green premium' nor a lower price for reclaim.'' [110] EPA is also aware of at least one study indicating that reclaimed HFCs may actually be more cost-effective than virgin manufacture, when considering the full refrigerant lifecycle. In the analysis for the proposed ER&R rule, EPA referenced a study, Yasaka et al. (2023),[111] which performed a life cycle assessment for the virgin production, destruction, and reclamation of R–410A, HFC–32, and HCFC–22 in Europe and Japan and found that the reclamation process had lower energy consumption and costs and emitted fewer GHG emissions compared to production and destruction, regardless of the refrigerant type or plant location. EPA is not aware of a similar study for the United States and so has conservatively assumed higher costs for reclaimed HFCs in the analysis for the final rule. Specifically, in its assessment of costs and benefits detailed in the Economic Impact and Benefits TSD and summarized above EPA has assumed a cost premium of 10 percent for reclaimed HFCs vis-a-vis virgin manufactured HFCs.

EPA notes that the commenter has not provided any quantitative information regarding a supposed cost increase in food prices resulting from refrigeration, or the effect that other factors such as refrigerant savings resulting from leak detection and repair provisions contained in this rule could have in mitigating such a cost increase.

EPA does not agree with the commenter's position that the requirement for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs will strand installed equipment. The commenter suggests a scenario where there is an insufficient supply of reclaimed refrigerant. As EPA notes above, the Agency considers these provisions as encouraging increased reclamation. Further, as described above, the provisions for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs finalized in this rule differ from the proposal. The Agency made changes from the proposal to delay the compliance date. Further, the Agency is only finalizing these provisions for refrigerant-containing equipment in three RACHP subsectors at this time. Accordingly, the Agency does not expect these concerns to be implicated by this final rule. The Agency does not agree that the provisions will result in unfavorable pricing for consumers. The Agency notes the overall phasedown of HFCs is more likely to affect the price of HFCs than these provisions. In addition, EPA describes current reclamation trends in other responses in this section, including reclamation of certain HFC refrigerants that are in blends and/or form the components of other blends. EPA anticipates that, while direct recovery reclamation of certain blends may be occurring at a lower rate, the recovery of blend components is expected to support the overall reclamation of these blends.

Comment: Another commenter suggested that this proposal will create confusion by requiring the use of reclaimed refrigerants in certain subsectors, while not requiring it in others even though some of these sectors use the same refrigerants. The commenter stated that, currently, based on EPA's proposal, stand-alone retail food refrigeration, supermarket systems, refrigerated systems, refrigerated transport, and automatic ice makers are required to use reclaimed refrigerants, but cold storage warehouses and IPR are exempt. The commenter suggested that the refrigeration reclaim usage requirements are not separated by subsectors. The commenter noted that the use of reclaimed refrigerants in imported equipment depends on the availability of recovered HFCs in the exporting countries and that it may be challenging to prove the authenticity of reclaimed refrigerants abroad. The commenter stated that these two factors could amount to an import ban for equipment with reclaimed HFCs. The commenter therefore requested that imported equipment be exempted from the mandatory use of reclaimed refrigerants.

Another commenter stated that the NPRM did not address how reclaim requirements would apply to imported units and HFCs. The commenter questioned what the effects of reclamation in other countries would be upon capacity in the U.S. market and suggested that EPA should not provide offshore producers with an advantage.

Response: EPA responds to comments about the requirements for servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs by noting that these types of provisions are within the authority under subsection (h) to promulgate regulations to control practices, process, or activities related to the servicing, repair, disposal, or installation of equipment. EPA disagrees that requiring that the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors and not others would create confusion. The Agency is establishing labeling requirements for containers of reclaimed refrigerants that contain HFCs (as discussed in section IV.E.1) such that equipment owners and operators can verify they are using reclaimed HFC refrigerants for servicing and/or repair

[110] See comment number EPA–HQ–OAR–2022–0606–0009.

[111] Yasaka, Yoshihito, et al. ''Life-Cycle Assessment of Refrigerants for Air Conditioners Considering Reclamation and Destruction.'' Sustainability, vol. 15, no.1, 2023, p. 473, doi:10.3390/su15010473.

of refrigerant-containing equipment in the supermarket systems, refrigerated transport, and automatic commercial ice maker subsectors. Further, EPA clarifies that this rule would not preclude the use of reclaimed HFC refrigerants in any manner. Consistent with the proposed rule and EPA's experience in the use of reclaimed ODS refrigerants, EPA anticipates that reclaimed HFC refrigerants will continue to play an increasingly significant role in the servicing and/or repair of existing equipment that use HFC refrigerants as the phasedown on production and consumption of virgin HFCs progresses.

EPA responds that the Agency is not establishing requirements for the initial fill of refrigerant-containing equipment with reclaimed HFCs at this time.

Comment: One commenter proposed an alternative where EPA could finalize a program to define a "service gas" to distribute the finite reclaimed HFCs across the entire service market, and in this alternative, exclude first fill requirements with reclaimed HFC refrigerants. The commenter further claimed that EPA could require a minimum percentage of reclaimed HFCs (with consideration of the 15 percent limit, by weight, on virgin HFCs) to be used in service gas sold to the aftermarket. The commenter further suggested requiring that all reclaimed HFCs be recovered from equipment manufactured in the United States (excluding equipment meeting GWPs under the 2023 Technology Transitions Rule and first fill requirements), claiming that this would maximize reclaim across the full market, maintain free market competition, return reclaimed higher-GWP refrigerants to service, and maximize reclaim as recovery rates grow over time. The commenter recommended that EPA consider different service levels by market sector, exempting IPR because of its requirement to continuously maintain temperature ranges.

A couple of commenters discussed the feasibility of EPA creating a new service gas category for refrigerants. One commenter requested that EPA reject arguments that reclaim goals cannot be met due to challenges in recovery practices and that a new service gas category can be used in the secondary market (that is less than 85 percent reclaim). The commenter contended that such arguments were intended to cast doubt on the ability of reclaimers to provide sufficient reclaimed refrigerant. Another commenter suggested that a limit on virgin refrigerant could thwart reclaim goals and restrict uses like a "service gas" where an increasing percentage of reclaimed refrigerant could be used over time.

Response: EPA did not propose and is not finalizing the creation of a service gas category for refrigerants as EPA does not agree that the creation of a service gas category is necessary. EPA acknowledges that under the CAA title VI phaseout ODS regulations, virgin HCFCs can be produced and imported in very small quantities solely for purposes of servicing certain appliances. For example, today under the "servicing tail" requirements, EPA issues allowances that allow for no more than 0.5 percent of the U.S. HCFC baseline to be produced and imported, requires that those HCFCs must be used solely for servicing, and further limits the allowances to only the two HCFCs with the lowest ozone-depleting potentials (*i.e.,* HCFC–123 and HCFC–124). The structure of the AIM Act and the CAA differs significantly in this area and, in particular, the AIM Act's phasedown and not phaseout of HFC production and consumption is a stark difference from the ODS structure, resulting in a need for a different approach with regards to servicing. EPA does not agree conceptually with a new category of gas that has a percentage of reclaimed material between a "virgin regulated substance" and "reclaimed refrigerant." It is EPA's view that the creation of this new category could create unnecessary complications in the market and could weaken the demand for reclaimed refrigerant rather than strengthening it. As EPA explains in section IV.E.1, the Agency is establishing a standard for the limit on the percentage of virgin HFCs, by weight, in reclaimed HFC refrigerants. EPA explains that, in addition to supporting maximizing reclamation, this standard helps to provide a consistent understanding of what constitutes reclaimed HFCs for their use in refrigerant-containing equipment. EPA views that a service gas category as described by the commenter would be detrimental to this, such that the service gas category would introduce refrigerants with more virgin HFCs than would be in reclaimed HFC refrigerants meeting the standard established in this rulemaking. Such a service gas category would contradict the goal of maximizing reclamation by allowing more virgin HFCs in the servicing and/or repair of refrigerant-containing equipment. Further, EPA anticipates that this approach would require additional recordkeeping, and potential reporting, to confirm particular owners and operators were using a service gas of a specified percentage of reclaimed HFCs. Where the commenter states that varying percentages of reclaimed HFCs could be in service gas by subsector, the Agency responds that this could create confusion on the market. Equipment owners and operators would be required to ensure that the correct service gas was being used to service and/or repair their refrigerant-containing equipment depending on the subsector they are in. The established requirements for the standard on reclaimed HFC refrigerants avoid this confusion by ensuring there is a consistent understanding of reclaimed HFC refrigerant on the market. This standard and the established labeling requirements (discussed in section IV.E.1) properly support the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors, such that equipment owners or operators in these subsectors can be sure that the reclaimed HFC refrigerants are compliant and can be used to service and/or repair their refrigerant-containing equipment.

As explained in other responses in this section, the provisions that EPA is finalizing to require that the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors are within the authority of subsection (h) of the AIM Act. EPA is also notes that the Agency discusses considerations and responds to comments related to establishing the servicing and/or repair with reclaimed HFCs provisions with a GWP limit (including considering those GWP levels established in the 2023 Technology Transitions Rule). The Agency is not establishing GWP-based cut-offs for reclaimed HFC refrigerants for the provisions in this rulemaking for servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors. Further, the Agency is not establishing requirements for reclaimed HFC refrigerants in the initial fill of any refrigerant-containing equipment in this rulemaking.

Comment: Several commenters expressed concern about patent and intellectual property issues with reclamation. One commenter recommended that EPA provide an exception for certain newer and commonly used low-GWP refrigerants such as R–448A, R–449A and R–407A, given that they are unlikely to be reclaimed in sufficient quantity to satisfy industry needs, as these substances have only recently started to be used in newly installed or retrofitted commercial refrigeration systems. The commenter further claimed that these refrigerants are subject to patents held

by their manufacturers; thus, not all reclaimers can legally formulate their blends, which will constrict supply. The commenter also stated that the proposed rule does not clarify EPA's analysis with respect to patent issues when carrying out HFC reclamation activities. Another commenter requested that EPA exclude patented or intellectual property-protected products from these requirements. One commenter stated that a portion of reclaimer recovered refrigerants are patented and cannot be reclaimed to AHRI 700 specifications without ''rebalancing'' through the addition of blend components. The commenter claimed that rebalancing puts reclaimers at odds with patent laws and the refrigerant producers. The commenter noted that if out-of-specification patented refrigerants fell under RCRA, within a year the reclaimers would be unable to process the material and unable to store it. Another commenter expressed concern about intellectual property restrictions, particularly for new low-GWP refrigerants. The commenter stated that reclaimers would need to secure authorization from producers to re-blend recovered HFCs into mixtures. The commenter suggested that this would be a bottleneck in the supply of reclaimed refrigerant and that recovered refrigerant should be primarily utilized to service the installed base (*e.g.,* R–410A) instead of for the production of low-GWP blends (*e.g.,* R–32 from R–410A to blend R–454B). Another commenter pointed out that many refrigerant blends are patented and cannot be reclaimed until the patents expire, which would make it impossible to supply the necessary refrigerants for this proposal.

One commenter recommended that the final rule exclude patented refrigerants from any reclaim requirements under subsection (h) due to the requirements' potential to create serious issues for patented blends and incentivize patent infringement. The commenter stated that licensing rights would need to be secured to sell patented blends. Alternatively, the commenter suggested that the reclaim mandates could compel owners or operators to prematurely decommission equipment, leading to high costs and waste, counteracting sustainability goals. Another commenter highlighted that other free market initiatives are already underway to support refrigerant recovery, reclaim, and recycling by U.S. companies exploring programs to enable the circularity of proprietary HFO blends. The commenter stated that EPA should not finalize any rule that incentivizes or requires patent infringement or authorizes reprocessing of patented blends when source material is unknown.

Response: On a global basis,[112] [113] EPA is also aware that some chemical producers have entered into agreements with reclaimers that support additional reclamation particularly where patents may be in place. EPA acknowledges there may be patents, licensing agreements, and other business practices that may impact the ability of some reclaimers to reclaim certain refrigerants. The Agency saw a similar situation when the market shifted from ODS to HFC refrigerants and to some extent has seen it with each introduction of a new HFC blend. However, requiring an upper bound of virgin HFCs, as the Agency is doing in this final rule, would not change whether or not a reclaimer could reclaim or introduce to commerce reclaimed HFCs.

Comment: Two commenters stated that the proposal to mandate the use of reclaimed HFCs in servicing/repair for certain subsectors exceeds EPA's authority in subsection (h) of the AIM Act, as the Act provides no authority for the Agency to single out specific subsectors to shoulder the increased costs of using reclaimed HFC refrigerants. The commenters noted that subsection (i) of the statute provides specific authority for EPA to ''restrict, fully, partially, or on a graduated schedule, the use of a regulated substance in the sector or subsector in which the regulated substance is used,'' and that EPA has used that authority to promulgate specific requirements for subsectors in the 2023 Technology Transitions Rule. One commenter continued by stating that subsection (h), the authority for this rulemaking, does not refer to ''sectors'' or ''subsectors,'' giving no basis for EPA to treat subsectors differently in requiring the use of reclaimed HFCs. The commenter noted that this action exceeds the scope of EPA's AIM Act authority and is arbitrary and capricious within the meaning of the Administrative Procedure Act.

Two commenters stated that the proposed rule would regulate the ''use'' of HFCs, which would require fulfilling prerequisites under subsection (i) of the AIM Act, and that this rulemaking does not fulfill them. The commenters stated that manufacturing a new unit or supplying refrigerant for servicing is not such a practice, process, or activity related to the servicing, repair, disposal, or installation of equipment. One commenter stated that subsection (h) provided one specific example for what would be ''appropriate''—requiring servicing, repair, disposal, or installation to be performed by a trained technician. The commenter further stated that the same practices, processes, or activities are done for virgin or reclaimed HFCs and the requirement to use reclaimed HFCs is removed from subsection (h)'s example of what is appropriate—technician training. The commenter also claimed that EPA's interpretation of subsection (h) was impermissibly broad and could cover ''anything and everything'' that has to do with HFCs as connected to equipment. The other commenter claimed that these practices do not include opportunities for reclamation. The commenter stated that EPA's justification under subsection (h) to require the use of reclaimed HFCs in certain applications to minimize the release of regulated substances is creating a situation where EPA's authority could theoretically become unlimited. The commenter gave a theoretical example of EPA requiring lower-GWP refrigerants in certain applications to ''minimize releases'' of HFCs.

Response: EPA disagrees with the comment that the requirement for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors exceeds EPA's authority in subsection (h) of the AIM Act. EPA does not consider the authority conveyed in subsection (i)(1), or the use of the terms ''sector'' and ''subsector'' in subsection (i), to preclude EPA from tailoring its regulations under other provisions of the Act to particular sectors or subsectors, where it is appropriate and reasonable to do so. As noted elsewhere in this action, EPA interprets the AIM Act as providing separate and distinct regulatory authorities, which can be implemented in ways that reinforce and complement one another. In this final rule, EPA is requiring that the servicing and/or repair of certain refrigerant-containing equipment be done with reclaimed HFCs as part of the regulations implementing its authority

[112] Chemours and Honeywell Announce Program to Enable Reclamation and Recycling of Refrigerants in Support of Circular Economy, November 16, 2022, available: *https://www.chemours.com/en/news-media-center/all-news/press-releases/2022/chemours-and-honeywell-announce-program-to-enable-reclamation-and-recycling-of-refrigerants-in-suppo.*

[113] A-Gas Named Authorised Reclaimer of Patent Protected Refrigerants, 2023, available: *https://www.agas.com/uk/news-insights/a-gas-named-authorised-reclaimer-of-patent-protected-refrigerants/.*

under subsection (h) of the Act. That provision directs EPA to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves: a regulated substance, a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant. A requirement for the servicing and/or repair of certain refrigerant-containing equipment be done with reclaimed HFCs controls a practice, process, or activity regarding the servicing or repair of equipment and involves a regulated substance or the reclaiming of a regulated substance. This requirement also supports and encourages reclamation of HFCs and thus is consistent with at least one of the purposes identified in subsection (h)(1). Accordingly, this requirement is within the scope of EPA's authority under subsection (h). In contrast to the regulations established under the 2023 Technology Transitions Rule, in this rule, EPA is not restricting the use of specific HFCs in a sector or subsector, nor is it limiting the use of HFCs based on a GWP threshold. Rather, it is requiring that the HFCs used in servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors meet criteria related to the processing of the HFC before it is used; specifically, requiring that the reclaimed HFC refrigerants meet specific purity standards and meet the established standards in this rulemaking limiting virgin HFC content (see section IV.E.1). EPA identified the refrigerant-containing equipment subject to this requirement by sector or subsector in part to build on terms that are already familiar to the regulated community so that it is easier to understand how these requirements will apply. Nothing in subsection (h) requires that regulations established under this subsection apply equally to all types of equipment. Such an interpretation would make little sense, as different types of equipment necessarily involve different practices, processes, or activities regarding their servicing, repair, disposal, or installation. EPA has explained its rationale for this action elsewhere in this preamble, and for those reasons, views this requirement as a reasonable measure to implement its authority under subsection (h)(1) of the Act.

In response to comments that state that subsection (h) provides one, specific example of what is ''appropriate'' to control, which the commenter states is technician training, EPA disagrees that the statutory language under subsection (h) is best read as narrowly defining technician training as the only appropriate practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment. Rather, EPA interprets the text at subsection (h)(1) to simply identify an example of a requirement that would fit within the scope of (h)(1), not as a limitation that would preclude establishing other regulations that are also within the scope of (h)(1). The fact that the statutory text says, ''including requiring, where appropriate . . .,'' indicates that the example was not intended as a limitation, as ''including'' makes clear that what follows is a potential requirement contemplated under the statutory text but does not exclude other possibilities. Further, the phrase ''where appropriate'' in the parenthetical suggests that Congress contemplated that the Agency would consider whether such a requirement was appropriate before establishing it, not that Congress automatically assumed that any such requirement would necessarily be appropriate, much less be the only appropriate option. Moreover, as discussed previously in this preamble, the phrase ''where appropriate'' in subsection (h)(1) provides EPA discretion to reasonably determine how the regulations under subsection (h)(1) will apply. Thus, as explained above, the phrase ''where appropriate'' in the parenthetical in subsection (h)(1) clearly leaves EPA flexibility to determine whether and in what circumstances to require that ''such servicing, repair, disposal, or installation be performed by a trained technician meeting minimum standards, as determined by the Administrator,'' as well as discretion to establish such minimum standards.

Comment: Two commenters stated that EPA lacks authority over non-servicing actions under the AIM Act. The commenters claimed that EPA's proposal in section 84.112 to regulate the marketing and sale of HFCs in commerce upstream from the use of HFC gas in equipment is not reasonably within EPA's authority. In particular, EPA's proposal to restrict the sale of reclaimed gas in section 84.112(b) does not relate to servicing of equipment, but rather restricts the sale of reclaimed gas upstream from the equipment. EPA's rule would restrict any sale of reclaimed HFCs in lieu of virgin gas for any uses that are still available to virgin gas under EPA's various AIM Act regulations. One commenter claimed that EPA is going beyond its subsection (h) authority by implementing reclaim requirements that go beyond maximizing reclaim and minimizing emissions that occur during specified events such as servicing and repair, and that EPA only has explicit authority to regulate releases from equipment and to ensure safety of technicians and consumers. The other commenter further asserted that, read together, the terms that Congress used—''servicing, repair, disposal, or installation of equipment''—naturally refer to work performed on equipment, not to the design of the equipment or the choice of which refrigerant gas is used in the equipment, and that given the context of the statute, it is not natural (and therefore not reasonable) to describe the choice of what gas is used in equipment as a ''practice, process, or activity.'' The commenter maintained that the choice or specification of what refrigerant gas to use to charge a system is simply not an ''activity'' as used in the statute, and that EPA's reading of the concept of ''activity,'' which they characterize as overly expansive, would lead to unexpected and overbroad results if, for example, specification of equipment components is considered to be an activity and EPA could dictate the type of steel used in the refrigeration system or the energy efficiency of the system.

The commenter asserted that the mandate to use reclaimed gas when servicing or repairing equipment relates to the choice of which gas to use, not to the activities that are normally considered repair and servicing such as refrigerant recovery or charging gas (apart from the choice of using virgin or reclaimed gas), replacing parts, or fixing coupling or seals, and further claimed that if Congress had intended to delegate to EPA the authority to dictate the type of refrigerant gas that can be sold in the marketplace, it would have provided express authority similar to that in subsection (i) relating to technology transitions. The commenter further stated that there is no indication in subsection (h) that Congress intended to give EPA the ability to ''eliminate virgin gas'' and replace it with reclaim gas. The commenter further claimed that had Congress intended to give EPA the power to do so, it would have ''stated so in clear terms.'' There is no indication in the AIM Act that the reclaim provision was intended to trump the allowance program and technology transition provisions in this way. The commenter claimed that in contrast, a narrower approach focused on equipment servicing is entirely consistent with the statutory goal of

increasing reclaim, reducing emissions, and enhancing safety.

Response: The Agency disagrees with the comments that these provisions go beyond its authority under subsection (h) of the AIM Act. The AIM Act provides various grants of authority to EPA, which, while separate and distinct, can be implemented in ways that reinforce and complement one another. Under subsection (h), for purposes including maximizing reclaiming and minimizing the release of a regulated substance from equipment, Congress directed the Administrator to promulgate regulations to control practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance and the reclaiming of a regulated substance used as a refrigerant. This final rule, including the requirements related to the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors, carries out this direction in subsection (h). The requirement for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs controls a practice, process, or activity regarding the servicing or repair of equipment and involves a regulated substance or the reclaiming of a regulated substance. This requirement also supports and encourages reclamation of HFCs and thus is consistent with the purposes identified in subsection (h)(1). Accordingly, this requirement is within the scope of EPA's authority under subsection (h). While this requirement regulates the activities of the person performing the servicing or repair by requiring that the refrigerant used during servicing or repair meet certain criteria, Congress did not limit EPA's authority under (h)(1) to only servicing activities that are performed directly on equipment. Rather, as noted previously, Congress authorized EPA to regulate a broader scope of processes, practices or activities *regarding* servicing, repair, disposal, or installation of equipment. The statutory term ''regarding'' is quite expansive and EPA interprets it broadly in this context. Selection of a refrigerant for servicing and/or repair is an important part of the servicing or repair process, as not all refrigerants are compatible with all equipment, and it is critical to select a refrigerant for servicing or repair that can appropriately be used with the equipment being serviced or repaired. For example, it would not be appropriate to use a flammable refrigerant in equipment that is designed to use only nonflammable refrigerants, so selecting the appropriate refrigerant for recharging such equipment after repair is a vital part of the repair process. The commenter's hypothetical examples regarding EPA dictating the steel used in the refrigeration system or its energy efficiency are inapposite because neither of those choices appear to involve a regulated substance or substitute, nor the reclaiming of a regulated substance (or substitute) used as a refrigerant. *See* subsection (h)(1)(A)–(D).

The limitation on selling, identifying, or reporting a refrigerant as reclaimed unless it meets certain criteria helps ensure that the refrigerant used to comply with the requirements for reclaimed refrigerants actually contains HFCs that have had bona fide use in equipment and been recovered from equipment before being reclaimed. This provision helps ensure that the requirements in this final rule achieve their regulatory purposes of maximizing reclamation and minimizing release of HFCs from equipment. For instance, it gives assurance to a technician purchasing refrigerant for servicing equipment in a RACHP subsector subject to the requirement to service with reclaimed refrigerant that refrigerant that is marketed as reclaimed refrigerant will meet EPA's regulatory requirements. Under EPA's interpretation of subsection (h), the practices, processes, or activities regulated by this provision have sufficient relation to servicing or repair of equipment to also be within the Agency's authority under subsection (h)(1). Because EPA is not finalizing, at this time, the proposed requirement for the initial fill of refrigerant-containing equipment with HFCs, it is not responding to comments concerning its authority for that provision.

Contrary to the commenters' assertions, EPA further notes that this provision does not restrict the sale of all refrigerants in the marketplace, but rather only applies to those refrigerants that are being sold, identified or reported as reclaimed. Further, these requirements do not mandate elimination of virgin gas from the supply chain, but rather prevent it from being sold, identified, or reported as reclaimed refrigerant and limits its use in servicing or repairing certain refrigerant-containing appliances. Moreover, this final rule does not reflect an approach that would ''trump the allowance program and technology transition provisions'' but rather contains requirements that are designed to serve the direction and purposes in subsection (h). Finally, EPA acknowledges the commenters' suggested approaches to refrigerant management that it believes EPA should adopt. Some of those suggestions are consistent with regulations that EPA is finalizing in this action; others reflect approaches that EPA did not propose and is not finalizing in this action, but which may be considered in the future under subsection (h).

Comment: A few commenters claimed that the proposed rule, if finalized, would improperly accelerate the phasedown of HFC production and import for specific sectors by restricting HFC use in those sectors to 15 percent of (baseline) levels for repair and servicing in contravention to the AIM Act and the HFC phasedown regulations. The commenters claimed that the proposed rule effectively mandates an 85 percent reduction of production and import of HFCs for use in those sectors by 2028, which is substantially faster than the 40 percent reduction in 2028 required by the AIM Act.[114] While the commenters recognized that the proposed acceleration is limited to certain subsectors and activities, the practical implications are much broader because HFCs are specific to end-use. The commenters requested that EPA reconsider the reclaim requirements because the AIM Act does not authorize such an acceleration of the HFC phasedown in these sectors; there is not sufficient evidence that supply of reclaimed HFCs can meet demand for the specific sectors; and the mandate will increase HFC prices in the sectors, resulting in harm to consumers.

Another commenter stated that the possible outcome suggested in the Draft RIA addendum for the proposed rule that the requirements for the use of reclaimed HFCs in refrigerant-containing equipment in certain RACHP subsectors would reduce the need for production of refrigerant. Further, the commenter cited that the high additionality case in the Draft RIA addendum showed environmental benefits related to reduced consumption. The commenter stated that to the extent that occurs, it would be an improper acceleration of the phasedown in contravention with subsection (f). The commenter, however, also suggested that EPA separately consider accelerating the

[114] EPA is clarifying the commenters' characterization of the phasedown on the production and consumption of HFCs under the AIM Act. The phasedown requires a 40 percent reduction from the baseline in 2024 (*i.e.,* 60 percent of the baseline) and a 70 percent reduction from the baseline in 2029 (*i.e.,* 30 percent of the baseline).

HFC phasedown pursuant to subsection (f) as a means of supporting reclamation. The commenter stated that there currently is an excess of HFCs available in the market due to stockpiling and soft demand for RACHP equipment. The commenter mentioned that the current over-supply of HFCs discourages reclamation. The commenter suggested that a 10 percent step-down in each of 2027, 2028, and 2029 would help prevent the shock of a sudden drop in supply and encourage reclamation.

Response: The Agency responds by noting the AIM Act provides various grants of authority to EPA, which, while separate and distinct, can be implemented in ways that reinforce and complement one another. As explained elsewhere in this notice, the requirements for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs are being finalized under subsection (h) of the AIM Act, consistent with the direction and purposes identified in that subsection. The Agency did not propose to and is not accelerating the HFC phasedown through this action, nor does the RIA addendum analyze an acceleration of the HFC phasedown. Rather, HFCs will continue to be available consistent with the phasedown codified at 40 CFR part 84, subpart A. Even if commenters' contentions were correct that these requirements would in effect reduce the production or consumption of HFCs used in particular sectors or subsectors faster than the scheduled reductions under the Act, that does not make this rule an acceleration under subsection (f). Subsection (f) addresses the EPA Administrator's authority to ''promulgate regulations that establish a schedule for phasing down the production or consumption of regulated substances that is more stringent than the production and consumption levels of regulated substances required under subsection (e)(2)(C)'' and the requirements for such regulations. As discussed in greater detail elsewhere in this notice, subsection (e)(2)(C) establishes an economy-wide phasedown schedule from baselines that are established pursuant to subsection (e)(1)(A) ''for all regulated substances in the United States,'' and the production and consumption phasedown is implemented on an exchange value-weighted basis (rather than establishing caps for particular HFCs). This rule does not change the phasedown schedule, alter the amount of HFC production and consumption allowed in any year on an exchange value-weighted basis, nor does it alter the number of allowances that EPA will allocate in a future year. Further, this rule does not prohibit any production or import of any HFC. Instead, the provisions in this rule govern specified processes, practices, and activities concerning the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs in specific subsectors.

EPA notes that consideration of accelerating the phasedown under subsection (f) of the AIM Act is beyond the scope of this rulemaking and thus the comment suggesting that EPA consider such an acceleration requires no further response.

Regarding the claim that the supply of reclaimed HFCs cannot meet the demand, the Agency notes that the Economic Impact and Benefits TSD examined such supply. While EPA's analysis does show that the amount of HFCs reclaimed in 2023 (latest year available) was less than the estimated demand, the data showed a significant increase in HFC reclamation compared to the previous year and showed that if this trend continued, there would be enough reclaimed HFC to meet the projected demand many times over. Further, in the Economic Impact and Benefits TSD, EPA evaluated the expected amount of HFCs from equipment coming out of service when the requirements for servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors take effect, and sees that such amounts, if reclaimed, could meet the demand on a chemical-by-chemical basis. Further, nothing in this rule prevents reclamation of refrigerants in compliance with the standard in this rule before the reclaim requirements take effect. Reclaimers or users may then choose to hold such materials for any expected demand later on, meeting the recordkeeping and reporting provisions that apply to such material.

In the Economic Impact and Benefits TSD, EPA assumed an increase in price for reclaimed refrigerant compared to virgin refrigerant. Based on comments received, the Agency also provided a sensitivity analysis under which it assumed cost parity between reclaimed and virgin refrigerant.

Comment: Two commenters recommended that EPA consider an accelerated reclaim refrigerant requirement for federally owned equipment or buildings to lead by example and stimulate reclaim market expansion. One of the commenters recommended this as a pilot program to assemble real-world data on costs and various issues. The commenter stated that a pilot could allow the validation of the Agency's assumptions about reclaim supply without risking adverse consequences. The commenter claimed that imposing a requirement for the use of reclaimed HFCs on Federal departments and agencies would allow EPA to assess the feasibility and resulting costs without imposing a widespread requirement nationwide. The commenter claimed that such a pilot would allow for the assembly of verified data and lead to ''lessons learned'' and the refinement of resulting regulation, minimizing any consumer and community impact that EPA may not have considered. Another commenter pointed to California as an example where reclaim requirements were implemented for State owned or operated equipment and noted the large number of buildings owned or leased by the Federal government. Another commenter noted that many large-scale purchasers are already purchasing reclaimed refrigerants and encouraged the General Services Administration and other Federal agencies to continue to support the reclaim market. Another commenter stated that the Biden Administration previously announced that the General Services Administration would review contracts to support the use of reclaimed refrigerants in facilities.[115]

Response: EPA appreciates the suggestion for a program aimed at federally-owned buildings. The Agency will share with other relevant Federal entities, including the General Services Administration, these comments encouraging a Federal program. While such a program is out of scope for this rulemaking and thus requires no further response, the Agency does note that for the leak repair provisions, the Agency did not propose and is not finalizing flexibilities that allow for additional time for federally-owned buildings, which is allowed under the related CAA section 608 regulations.

Comment: One commenter stated that, if EPA finalizes any of the proposed reclaim requirements, EPA should: require contractors to maintain records (subject to audit) of the quantity and type of refrigerant recovered and used to service equipment, require OEMs, distributors, reclaimers, and other allowance holders to annually report on the quantities of refrigerant recovered,

[115] The White House, ''FACT SHEET: Biden Administration Combats Super-Pollutants and Bolsters Domestic Manufacturing with New Programs and Historic Commitments,'' The White House, September 23, 2021, available at: *https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/23/fact-sheet-biden-administration-combats-super-pollutants-and-bolsters-domestic-manufacturing-with-new-programs-and-historic-commitments.*

reclaimed, disposed of, and introduced into commerce, and review EPA's program, including opportunity for public comment, by October 1, 2026, and finalize revised standards by 2027. The commenter also requested that EPA "condition the effectiveness of such requirements on the development of new certification standards for contractors."

Response: EPA responds to this comment that the Agency solicited comments in an ANPRM related to technician training, certification, and other considerations. The Agency acknowledges the comment related to requiring certain recordkeeping and/or certification standards for contractors and considers this comment related to the ANPRM. As such, the Agency is not addressing the comment at this time.

As discussed earlier in this section, EPA is establishing a discrete reporting requirement for relevant data to be submitted to the Agency to evaluate the availability of reclaimed HFC refrigerants being supplied for servicing and/or repair of refrigerant-containing equipment in the supermarket systems, refrigerated transport, and automatic commercial icemakers subsectors. EPA is establishing these reporting requirements to be prior to the compliance date of the requirements for reclaimed HFC refrigerants used for servicing and/or repair in these subsectors. EPA intends to consider the reported data and evaluate the requirements that begin as of January 1, 2029.

Comment: One commenter claimed that subsection (h)(2) does not give EPA authority to require the use of reclaimed substances or substitutes. The comment stated that subsection (h)(2) simply provides that "[i]n carrying out this section" EPA is to "consider the use" of authority under "this section" with regard to opportunities for reclaim. The commenter asserted that this provision must be read within its statutory context and does not provide EPA with authority to utilize authority contained outside of subsection (h). The commenter stated that subsection (h)(2) is "most naturally read" to mean that when instituting regulations relating to servicing, repair, disposal, or installation of equipment, EPA consider opportunities for refrigerant reclamation. The commenter also stated that EPA cites no legislative history to support a broader interpretation of (h)(2), and asserts that EPA is arbitrarily creating an unauthorized, mandatory market for reclaimed HFCs based on its reading of the purposes of this section, while simultaneously claiming that market forces alone will increase the amount of reclaimed HFCs available. The commenter further stated that there is no "market failure" for EPA to correct via regulation, and that market forces should take precedence.

Response: Although the commenter does not specify which part of subsection (h)(2) of the AIM Act the comment is referencing, the Agency, based on the excerpt quoted (which appears in subsection (h)(2)(A) of the Act) interprets this comment to relate to subsection (h)(2)(A) but not subsection (h)(2)(B), which as discussed elsewhere in this notice pertains to reclamation of recovered HFC refrigerants. As discussed in the proposal and in this final rule, the Agency has considered the use of authority available to the Administrator to increase opportunities for reclamation of HFCs used as refrigerants in developing the requirements established in this rule. As this action is taken under subsection (h) of the Act, EPA need not address the application of subsection (h)(2)(A) to other subsections of the AIM Act, and to the extent that the comment relates to other subsections of the Act it is beyond the scope of this rulemaking and thus requires no further response. As discussed in more detail elsewhere in this preamble and in other responses to comment, EPA interprets the requirements established in this final rule to perform servicing and/or repair of certain appliances in certain sectors or subsectors with reclaimed HFCs as being within the scope of its regulatory authority under subsection (h)(1) of the Act. Subsection (h)(1) of the AIM Act directs the Agency to establish regulations to control, where appropriate, practices, processes, or activities regarding the servicing or repair of equipment that involves a regulated substance or the reclaiming of a regulated substance used as a refrigerant. The relevant provisions in the final rule control the servicing and/or repair of certain refrigerant-containing equipment by requiring that it be done with reclaimed HFCs and thus are within this authority and support the purpose of maximizing reclaim of HFCs. This interpretation is based on the text of subsection (h), as the available legislative history for the AIM Act is very limited, and the commenter does not cite any statutory text or legislative history to suggest that this interpretation is inconsistent with Congressional intent. Given that the statutory text in subsection (h)(1) identifies particular purposes for regulations established under this provision, it is reasonable to consider those purposes in establishing such regulations, as EPA is doing in this rule. The Agency disagrees with the commenter's assertion that these requirements arbitrarily create an unauthorized, mandatory market for reclaimed HFCs. While EPA acknowledges that existing market dynamics may incentivize the use of reclaimed refrigerants over time, as explained elsewhere in this final rule, the Agency disagrees with the conclusion that those possible incentives mean this requirement is unneeded or that those market dynamics mean that the Agency should not establish these requirements. Congress put particular weight on reclamation in subsection (h) of the AIM Act, including through the provisions of (h)(1) and (h)(2)(A) referenced previously in this response. Even assuming that market dynamics or implementation of other programs lead to some additional use of reclaimed refrigerant over time, the commenter did not provide any reason to think that those factors alone would "maximize" reclamation as stated in subsection (h)(1). It is the Agency's view that the reclaim requirements established in this action will help increase reclamation and support additional recovery of HFC refrigerants, are within its authority under subsection (h) of the Act, and will help serve the purposes identified in that subsection.

Comment: One commenter requested that EPA revise its proposed language in sections 84.112(e) and (f) to specify that all permissible substitutes will continue to be allowed for servicing and repair. The commenter stated that EPA's proposed regulatory language in sections 84.112(e) and (f) could be read to require that refrigerant-containing appliances in the identified subsectors may only be serviced and repaired with reclaimed HFCs, to the exclusion of substitutes.

The commenter stated that robust demand for reclaimed HFC refrigerant already exists and will continue to grow significantly due to the AIM Act's phasedown of HFCs. The commenter requested that EPA revise its proposed language to specify that all permissible substitutes will continue to be allowed for servicing and repair and include a regulatory exception to relieve the obligation to comply where there is an inadequate supply of reclaimed HFCs to meet service and repair needs in the identified subsectors.

Response: EPA responds that substitutes for HFCs can be used in the servicing and/or repair of refrigerant-containing equipment in the RACHP subsectors included in this rulemaking (*i.e.,* supermarket systems, refrigerated

transport, and automatic commercial ice makers). The proposed regulatory text at section 84.112(f) was intended to require that the servicing and/or repair of refrigerant-containing equipment in these subsectors must be done with reclaimed HFCs, where those pieces of refrigerant-containing equipment use a refrigerant containing an HFC, but would not apply to refrigerant that contains no HFCs or to any non-HFC constituents in the refrigerant. For example, if an owner or operator uses CO_2 as the refrigerant in its existing supermarket system, they would not be required to service and/or repair the refrigerant-containing equipment with reclaimed refrigerant, since such equipment is not using a refrigerant that contains an HFC. EPA is finalizing revisions to the regulatory text to make this intent clearer in response to this comment but does not view these edits as changing the substance of the provision. As discussed elsewhere in this preamble, EPA is not finalizing in this rule, the proposed requirement for the initial charge of new refrigerant-containing equipment with reclaimed HFCs and thus, is not making parallel edits to that provision. For the reasons described in a prior response to comment in this section, the Agency does not agree that exceptions are needed for the requirements to service and/or repair existing equipment in the covered subsectors using reclaimed HFCs when there is an inadequate supply and thus is not finalizing such an exception. The Agency recognizes that commenter's points on the existing market for reclaimed HFCs and agrees with that commenter's views that this market will in fact grow. The Agency is finalizing provisions to support and encourage growth in reclamation.

Comment: One commenter suggested EPA allow the use of reclaimed refrigerant for servicing in 2025 to be credited against compliance obligations in future years. Another commenter requested that EPA confirm that exports of virgin HFCs will be eligible under the Request for Additional Consumption Allowance (RACA) program, regardless of when the original HFCs or individual blend components were imported. The commenter added that it is critical that the RACA program, under 40 CFR 84.17, be available to obtain allowances for HFCs that can be used in the United States and that EPA has projected will be available in the market. The commenter stated that this is essential to minimizing stranded assets and preventing further disruptions to the market that would ultimately effectuate significant commercial harm to the after-market and ultimately to consumers).

Response: EPA disagrees with the suggestion that the Agency allow the use of reclaim refrigerants for servicing and/or repair in 2025 to be credited against compliance obligations for future years. The Agency did not propose and is not finalizing any sort of early crediting regime. In the NPRM, EPA did discuss scaling the reclaim requirements for servicing and/or repair on a percentage basis, but as discussed in responses earlier in this section, the Agency is not finalizing that approach. However, EPA encourages early action by industry to support the uptake of reclaimed HFC refrigerants ahead of the compliance date.

Comments or requests concerning the structure of the allocation program are beyond the scope of this rulemaking. However, the Agency notes, allowing entities to receive allowances for the reclamation of refrigerant would artificially inflate the number of allowances in the market.

EPA agrees that the RACA process under 40 CFR part 84 subpart A is important to allowance holders. EPA is not modifying that RACA program in this rulemaking, and EPA further notes that the reclamation requirements for servicing and/or repair of refrigerant-containing equipment in certain subsectors in this rulemaking will not impact the RACA program.

Comment: Another commenter recommended that EPA not replicate California's HFC programs because California State law has no bearing on how the Agency interprets the AIM Act and because the State's current R4 Program is short term in nature. The commenter stated that EPA should avoid adopting different regulatory provisions based on State law instead of the intentional design of the AIM Act. The commenter claimed that the R4 Program was created as an interim measure after CARB finalized sector control limits that could not be implemented by the effective date. The commenter suggested that EPA consult with OEMs to understand the complications and burden of the R4 Program when the first reports are due in July 2024 and not to adopt provisions until after this.

Response: EPA acknowledges these comments and responds that the Agency proposed a rule and is now establishing provisions based on that proposal that are in correspondence with the AIM Act, not a State's regulation or legislation. EPA referenced and reviewed multiple States' programs and policies in place or under consideration, including the California regulations, when developing the proposed rule. The Agency reviewed these regulations for informational purposes and awareness of what was being implemented under those programs; however, EPA did not propose and is not finalizing regulations that mirror, fully, any specific State requirements, nor was it the Agency's intent to do so. EPA consulted with many different stakeholders when developing the proposal, including information from comments received on the Agency's NODA, through multiple webinars, and through the comment period, including from OEMs. EPA is finalizing requirements for the servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors and is not finalizing requirements for reclaimed HFC refrigerants in the initial fill of refrigerant. The Agency acknowledges that in many instances, the industry seeks alignment with Federal and State regulations. However, this regulation is being finalized consistent with, and to serve the particular purposes of and direction in, subsection (h) of the AIM Act, and EPA understands that States are promulgating regulations based on their State authorities.

Comment: EPA received a few comments on establishing requirements for refrigerant recovery. One commenter was disappointed that EPA did not propose requirements that would increase recovery of refrigerants from existing equipment, but instead focused requirements on increasing demand for reclaimed refrigerant. The commenter stated that government mandates are not needed to increase demand through the HFC phasedown and that such solutions will not maximize reclamation. The commenter also stated that there does not appear to be a bias for or against reclaimed refrigerant according to distributors, so the emphasis should be on increasing refrigerant recovery. The commenter suggested that, if mandates are put in place, such mandates should be visible to the technician community by creating access to reclaimed refrigerant to create an incentive to increase their recovery rates. The commenter claimed that technicians understanding that reclaimed refrigerant must be used in servicing and that no additional virgin material is allowed will have a better understanding of why recovery is required.

Another commenter stated that not only is recovered refrigerant not reaching reclaimers, there also seem to be stockpiles not turned in to reclaimers. The commenter also stated that they have heard that it takes too long to recover refrigerant, especially R–410A. The commenter noted that this

could be because of using the recovery equipment for R–22 instead of R–410A. The commenter suggested that EPA may want to consider using some of its funding for small contractors serving low and medium-income communities to apply for grants or to outright purchase the correct recovery equipment. The commenter further suggested that EPA may wish to interview contractors to better understand the challenges they face with recovery and price points to incentivize purchasing reclaimed refrigerant. The commenter noted that despite these relatively high prices, reclaim rates have never been above 5,000 metric tons per year for HCFC–22, even with a complete ban on newly produced HCFC–22 for servicing, according to EPA's Summary of Refrigerant Reclamation.

One commenter states that the proposed rule did not pay sufficient attention to the role of recovery in maximizing reclamation. The commenter further proposed that, given the central role recovery plays, EPA should initiate a new rulemaking under subsection (h) of the AIM Act as soon as possible to ensure these and other issues related to recovery are adequately addressed before any further reclaim mandates are considered.

Another commenter recommended considering process enhancements to reduce refrigerant contamination before reuse or return for reclaim arguing that many reclamation facilities without fractional distillation capacities cannot separate components when contamination is above 15 percent. The commenter requested that EPA evaluate how much refrigerant is returned contaminated and how much is destroyed annually and integrate tools to reduce cross-contamination to maximize the potential for reusing refrigerants.

One commenter stated that increasing the recovery of HFCs for reclamation is essential for economic growth and other environmental benefits, while another commenter stated the importance of mandates for increased recovery is needed to support reclamation. Another commenter noted that financial incentives for technicians may be effective to enhance recovery of HFCs. Another commenter stated that in addition to incentivizing recovery, regulations can be effective for enforcement of recovery of HFCs.

One commenter stated that the requirements for reclaimed HFCs would lead to increased demand for reclaimed HFCs and thus incentivize recovery of HFCs; however, additional measures may also be needed to bolster recovery. The commenter requested that EPA consider establishing a standard for equipment used to recover refrigerant to control leakage during recovery.

Response: EPA responds to these comments that requirements established for the recovery of HFCs from equipment would be related to those requirements for technicians and contractors performing the actual recovery. EPA understands that critical link between recovery and reclamation and agrees that increased recovery of refrigerants supports the increased reclamation of those refrigerants. The Agency views requirements related to recovery under the authority of subsection (h) of the AIM Act, as they are related to practices, processes, or activities related to the servicing, repair, or disposal of equipment. Recovery of the refrigerant would likely be a practice, process, or activity required to remove the charge of refrigerant to repair the equipment or would be performed during the process of disposing the equipment to recover the refrigerant before it is disposed. EPA views such practices, processes, or activities as those performed by a technician or contractor, and the Agency refers to the ANPRM published related to technician training, certification, and other considerations. The Agency, thus, acknowledges these comments and will consider them for a future rulemaking under subsection (h) of the AIM Act.

EPA acknowledges comments related to using the proper recovery machines to recover refrigerants from equipment. EPA also notes that certified recovery equipment is required for such practices, as handled under other regulations under the CAA.[116] EPA acknowledges the comment related to grant funding for recovery equipment and notes that such considerations are outside of the scope of this rulemaking. EPA agrees there is value in understanding challenges faced with recovery of refrigerants. As previously stated, EPA solicited comments in an ANPRM on considerations related to technicians and, while not addressing in this rulemaking, the Agency will review and consider those for future rulemakings.

[116] EPA has established standards for recovery and/or recycling equipment under section 608 of the CAA for the service, repair, or disposal of appliances containing ODS and ODS substitutes (*e.g.,* HFCs) under 40 CFR 82.158. Additionally, EPA has standardized equipment for the servicing of refrigerant from MVAC systems under CAA section 609, and any technician servicing equipment for consideration must use approved refrigerant handling equipment pursuant to 40 CFR 82.36.

Comment: One commenter suggested that there is evident viability of on-site recycling during the refrigerant recovery process for HVACR appliances. The commenter stated that as long as HVACR technicians use AHRI 740 certified equipment and establish refrigerant identification protocols, the recycled refrigerant will be suitable for reuse within the same system. The commenter recommended that this industry learn from the successes that the MVAC industry has had with refrigerant reclamation. The commenter also recommended that there be a defined process to qualify refrigerant for reuse in the field alongside on-site analyses. In addition, the commenter stated that a refrigerant identifier or analyzer should be present. The commenter noted that such measures are fundamental to the safe and proper recycling of refrigerants to mitigate risks associated with the use of unqualified or contaminated refrigerants and to provide an alternative to reclaiming all refrigerant extracted.

Response: EPA responds to this comment that on-site recovery and recycling for stationary refrigerant-containing equipment is a current practice in industry, such that the recovered refrigerant is used in the same piece of refrigerant-containing equipment or is recovered and used in another piece of refrigerant-containing equipment of the same owner. This practice is consistent with the requirements under 40 CFR 82.156(h), which are applicable to appliances containing ODS refrigerants as well as certain substitutes for ODS refrigerants (*e.g.,* HFCs). This rulemaking does not affect such practice and EPA notes that HFC refrigerants that are recovered can continue to be recycled to the same piece of refrigerant-containing equipment that the HFC refrigerant was recovered from or another piece of refrigerant-containing equipment under the same ownership.

EPA recommends but does not require the use of refrigerant identification technology in the servicing of AC systems. EPA agrees that refrigerant analyzers are an important tool to identify contaminated systems and to prevent a technician from charging the incorrect refrigerant into an air conditioning system. While not addressed in this rulemaking, EPA considers this comment to fall under the scope of the ANPRM as it relates to considerations for technicians. As explained in section VIII below, EPA is not responding to comments related to the ANPRM in this final rule.

Comment: One commenter stated that the proposed rule disrupts the supply

chain by creating a captive market where specific market transitions are mandated, losing economic incentives to lower the costs of products. The commenter claimed that the proposed rule requires that OEMs and technicians buy reclaimed HFCs, creating a closed market with a finite amount of reclaimed HFCs. The commenter claimed that EPA has not analyzed the cost impact of such an unbalanced, artificial market to the end consumer, nor the potential concentration of a finite reclaimed HFC supply within a small number of suppliers. The commenter recommended that proposed mandates be validated by robust supply/demand modeling.

Response: EPA responds to the commenter's concerns for a closed market and relevant analysis. This rulemaking does not limit the production or consumption of HFCs. HFCs will continue to be produced and imported in accordance with the phasedown schedule. HFCs will be available to be sold and distributed for a range of eligible applications. It is likely that as the phasedown continues, shifts in which HFCs are produced and imported will occur as well. The Agency notes and directs interested readers to the Allocation Framework Rule, where the Agency discussed more fully the use of an exchange value weighted approach rather than a chemical-to-chemical approach to phasing down HFCs.

The Agency acknowledges that by requiring the servicing and/or repair of refrigerant-containing equipment with reclaimed refrigerant in certain RACHP subsectors, the Agency is precluding the use of virgin HFCs for servicing and/or repair in those applications. The Agency disagrees that requiring the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain subsectors would create any sort of monopoly, as EPA has not mandated that stakeholders purchase refrigerant from any specific entity.

The Agency notes that there are over 50 certified reclaimers in the United States. Therefore, there will be sufficient competition among those reclaimers to supply reclaimed HFCs. The Agency further notes that there are only five HFC producers with production facilities in the United States, and often there is only one facility producing each of the HFCs that are produced domestically, with other HFCs only available through imports. Supply of virgin HFCs is significantly augmented by imports, and on an annual basis between 2024 and 2028, there are, or will be, approximately 75 companies with EPA-issued consumption allowances that allow them to legally import virgin or reclaimed HFCs.

EPA has analyzed the compliance costs and benefits for using reclaim requirements in the Economic Impact and Benefits TSD included with this rulemaking. Results from this analysis indicate that requiring the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in the covered subsectors by this rulemaking may result in incremental costs to industry while also reducing demand for virgin HFCs. This reduction in demand may in turn reduce costs to industry by alleviating potential supply shortages, although EPA has not quantified such cost savings in its analysis. A study[117] cited by EPA in the Economic Impact and Benefits TSD and comments EPA has received from at least one reclaimer of HFCs also indicate that the use of reclaimed HFCs may actually be on par with or more cost-effective than the use of virgin HFCs. Therefore, EPA has included a sensitivity analysis in its Economic Impact and Benefits TSD in which the use of reclaimed HFCs is assumed to be cost-neutral.

Comment: One commenter claimed that the existing record does not show a current need for the requirements for the use of reclaimed HFCs in certain RACHP subsectors, noting that the proposed rule extols the successes of recycling and reclaiming Class II ODS. The commenter cites EPA's *Draft Report—Analysis of the U.S Hydrofluorocarbon Market: Stakeholders, Drivers, and Practices* (September 2023) in arguing that the use of recycled/reclaimed HFCs was already anticipated as a path to compliance with the phasedown. Further, the commenter noted that among impediments to the U.S. reclaim market noted in the draft report, inadequate demand for reclaimed HFCs was not identified as such an impediment to the market. The commenter also stated that environmental benefits estimated for the requirements for using reclaimed HFCs are non-existent, and that the requirements could result in shifting allowance use to meet demand in other sectors and subsectors.

Response: EPA responds that the requirements for reclaimed HFC refrigerants in the servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors are being established under subsection (h)(1) of the AIM Act, which provides EPA with the authority to promulgate regulations to control, where appropriate, "any practice, process, or activity, regarding the servicing, repair, disposal, or installation of equipment" for purposes that include maximizing reclamation and minimizing releases of HFCs from equipment. EPA views these requirements for using reclaimed HFC refrigerants in the servicing and/or repair of refrigerant-containing equipment as controlling a practice, process, or activity regarding the servicing and/or repair of such equipment, and as helping serve the purpose of maximizing reclamation, as the requirements present opportunities for increased recovery of used refrigerants and use of and demand for reclaimed HFCs and thus increased reclamation. Even assuming increased recycling or reclamation is anticipated to occur under the phasedown, the commenter provides no reason to think that such voluntary increases alone would be sufficient to serve the statutory purpose identified in subsection (h)(1) of maximizing reclamation. To the extent that the commenter suggests that EPA must demonstrate a particular degree or magnitude of current need to establish regulations under subsection (h)(1), EPA disagrees, as such a requirement is not explicitly stated in the statutory language of subsection (h). Nonetheless, for the reasons described earlier in this response and elsewhere in this final rule, the Agency concludes that these requirements are appropriate to serve purposes identified in subsection (h)(1) and to implement that provision.

EPA acknowledges that inadequate demand was not identified as a barrier to increased reclamation in the Draft Report. However, as the Agency explains in this rulemaking and consistent with the proposed rule, these provisions are expected to support additional recovery of HFC refrigerants and, thus, reclamation. As noted in a previous comment response, EPA's Economic Impact and Benefits TSD does not include increased recovery in the base case for this rule based on the assumptions for that scenario; however, EPA did consider an alternate scenario with increased recovery and anticipates that the reclamation provisions could support increased recovery during servicing or disposal where the refrigerant may otherwise have been vented or released. EPA notes that the barriers described in the Draft Report were intended to capture the status of the reclamation industry and inform this rulemaking. The Draft Report identified barriers such as separating

[117] Yasaka, Yoshihito, et al. "Life-Cycle Assessment of Refrigerants for Air Conditioners Considering Reclamation and Destruction." Sustainability, vol. 15, no.1, 2023, p. 473, doi:10.3390/su15010473.

mixed refrigerants and refrigerant release events (*e.g.,* leakage during operation or venting at EOL), among others. The provisions in this rule and current market dynamics help to address these barriers. This final rule is expected to encourage reclamation and drive innovation in separation technologies as well as capacity of these technologies to meet the estimated demand of reclaimed HFCs related to the requirements in this rule. Further, the requirements related to leak repair and ALD systems will lead to reduced amounts of emissions of refrigerants from appliances; thus, ensuring additional material is available to be recovered and reclaimed.

The Agency acknowledges that allowance use for virgin HFCs may shift related to the provisions established in this rulemaking. However, the Agency anticipates that any such shifts in use of allowances would be related to allowances needed for difficult to transition applications where a path to substitutes for HFCs is less clear at this time. Further, even assuming such shifts occur, they do not provide a reason to not finalize the requirements in this rule. If anything, they merely provide an example of how implementation of this rule may also have the effect of assisting in supporting implementation of other programs under the AIM Act.

Comment: One commenter suggested that EPA did not analyze the economic cost and consumer pricing impacts of the HFC supply and demand mismatch. The commenter stated that EPA's awareness of impact without analysis is not consideration of relevant factors required by subsection (h). The commenter stated that the NPRM does not estimate the costs of resetting the market through new customer/supplier relationships, and the commenter further stated that restricting HFC quantities would increase refrigerant prices. The commenter stated that certain refrigerants from producers (*e.g.,* certain HFC–32 lines) may no longer be economically viable and stated that the NPRM should have considered the likelihood of stranding production assets. The commenter additionally asserted that the reclaim mandate eliminates incentives to develop low-GWP blends with an HFC component, and recommended that EPA base any reclaim requirement on robust and appropriate data.

Response: The HFC allowance allocation system is out of scope for this rulemaking; however, EPA reminds readers that the United States is phasing down HFC production and consumption. The overall phasedown of HFCs will result in changes in production and consumption of specific HFCs and blends. Furthermore, the commenter mischaracterizes the relevant factors for this rulemaking. The Agency has provided an analysis of the costs and benefits of this rule for informational purposes and to address E.O. requirements. The Agency does not rely on this information as a record base for this rule and would have reached the same conclusions without this analysis. Instead, this rule is focused on serving the statutory purposes identified in subsection (h), which are maximizing reclaiming and minimizing the release of regulated substances from equipment and ensuring the safety of technicians and consumers.

EPA disagrees that the proposed rule disincentivizes the development and deployment of low-GWP blends. As noted elsewhere, the overall phasedown of HFC production and consumption, as well as the 2023 Technology Transitions Rule, will affect both the overall supply and demand for virgin HFCs. The Agency does not agree that this rule results in a mismatch of supply and demand. Nor does the Agency consider this rule as contributing to a disincentive for U.S. innovation. The Agency further notes that innovation can come in many forms. It could be the introduction of new chemistry, and it also could include better and more efficient ways to recover and reuse HFCs, including through HFC reclamation technologies.

Further, EPA is establishing a reporting requirement in this rulemaking for information related to the availability of reclaimed HFC refrigerants in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors. EPA intends to assess the reported data and consider further evaluating the established requirements for reclaimed HFC refrigerants in the servicing and/or repair of refrigerant-containing equipment in these subsectors.

Comment: One commenter expressed concern that there is no plan for banned virgin refrigerants that can no longer be used for service in the proposed sectors. The commenter claimed that these virgin refrigerants would have no value. The commenter stated that EPA has not done research to determine the quantity of HFCs currently stockpiled in the country (imported before the AIM Act) and that this quantity is large. The commenter recommended a carbon credit program for destroyed HFCs and stated that without such a program the price of virgin HFCs will drastically decline as distributors with stockpiles sell this material, limiting the number of system retrofits to lower-GWP refrigerants. The commenter noted that this would continue until late 2027, at which point companies would be forced to change or use expensive and scarce refrigerant to service equipment, leaving considerable virgin material with no value and no destruction and carbon credit program. The commenter questioned if there was a need to speed up the HFC phasedown that is already in place.

Another commenter stated that the requirements for using reclaimed HFC refrigerants for refrigerant-containing equipment in certain RACHP subsectors could have adverse effects on existing allowance holders by denying them customers and therefore harming business plans and investments.

Response: EPA disagrees that a specific plan is needed for the virgin HFCs that would have been used for the servicing and/or repair of refrigerant-containing equipment in the covered RACHP subsectors where this rule requires that those activities be done with reclaimed HFCs. EPA also disagrees that these virgin HFCs would have no value, as they could still be used other applications, such as the servicing and/or repair of refrigerant-containing equipment in other RACHP subsectors. Furthermore, the Agency is not at this time finalizing requirements for the initial charge of refrigerant-containing equipment, and the virgin HFCs could be used in these cases. EPA notes that the requirements to service and/or repair refrigerant-containing equipment in the supermarket systems, refrigerated transport, and automatic commercial ice makers subsectors will be effective beginning January 1, 2029. Regulated entities would have approximately four years to determine how to best use any remaining virgin HFCs that they own, which includes the option to continue servicing and/or repairing refrigerant-containing equipment with any virgin HFCs they own until these requirements are effective.

The Agency disagrees with the need to establish a destruction program for virgin HFCs for generating carbon credits. As stated above, EPA disagrees with the commenter's statement that virgin HFCs would lose their value, as they could be used in other applications. Further, the Agency notes that it has been more than 30 years since the CFC phaseout, yet there is still demand for reclaimed CFCs, indicating there is continued demand for these substances. EPA believes there will continue to be demand for both virgin and reclaimed HFCs as the phasedown progresses and even after the final step of the phasedown, when 15 percent of

the baseline of production and consumption of virgin HFCs will be allowed. EPA discusses this in a prior response in this section, noting that any such program would, among other things, need to consider additionality of any generated credits and moreover such consideration of carbon credits is outside of the scope of this rulemaking. EPA notes that the phasedown of production and consumption addresses virgin HFCs by reducing the overall levels in a stepwise fashion while not precluding their use generally in a range of acceptable applications. Regarding comments about stockpiles of HFCs in the United States, the Agency responds that as with the CFC phaseout, the Agency anticipates the continuing demand for these HFCs in the multitude of acceptable applications. The 2024 Allocation Rule provides additional detail related to assessing stockpiling and how that is considered in the methodology for allocating allowances.[118] EPA notes that allocation of allowances is out of scope for this rulemaking.

EPA disagrees that this rulemaking would accelerate the phasedown of HFCs under the AIM Act, which would require meeting specific criteria as provided in subsection (f) of the AIM Act. EPA responds to comments regarding the acceleration of the phasedown in an earlier response in this section.

EPA disagrees that the requirements for the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors would drastically disrupt current allowance holders' business plans. EPA is not establishing requirements for reclaimed HFC refrigerants in the initial fill of refrigerant-containing equipment in this rulemaking. Such requirements are only for the servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors. Most of these existing types of equipment are currently using refrigerants that contain HFCs that have been in equipment for an extended period of time. As such, these types of refrigerant-containing equipment are likely to continue to rely on reclaimed HFCs as the phasedown progresses. EPA does not dictate how allowance holders use their allowances but understands that some may use allowances for refrigerants that contain HFCs that would be compliant with the 2023 Technology Transitions Rule. Further, as noted above, EPA is establishing a compliance date of January 1, 2029, for the requirements for reclaimed HFC refrigerants for servicing and/or repair of refrigerant-containing equipment in certain RACHP subsectors. This period of approximately four years provides entities with time to secure and adjust business relationships as needed.

Comment: One commenter recommended that, if after each three-year period (starting in 2028) EPA requires each consumption allowance holder to acquire a quantity in exchange value equivalent metric tons of reclaimed HFCs produced by any U.S. reclaimer equal to a portion of their consumption allowance allocation (capped at a maximum five percent to reasonably balance the supply of reclaimed material with consumption holder demand) and the program remains necessary, then the percentage be adjusted for the following three-year period based on changes over the prior three-year period in reclaim capacity and availability, the supply of HFCs, and market demands. The commenter stated that the program could include exemptions for *de minimis* allowance holders and economic hardships, such as lack of reclaimed HFCs in the market or unreasonable prices.

Response: EPA responds that this comment is out of scope for this rulemaking. EPA did not propose or seek comments on changes to the allowance system codified at 40 CFR part 84, subpart A.

Comment: One commenter stated that if EPA goes forward with these requirements, it should make grant funding available to offset the increased costs associated with purchasing reclaimed HFC refrigerant, and the requirement should be imposed only on grant recipients.

Response: EPA notes that establishment of grant funding is outside the scope of this rulemaking.

Comment: One commenter expressed concern that the proposed rule could impact smaller businesses by adding tasks for recovering HFCs and for related logistics and that burdensome demands coupled with potentially unrealistic reclaim targets may divert resources from core operations and stifle innovation of the value chain.

The commenter further stated that requirements for reclaimed refrigerants at the OEM level is impractical, and that the Agency should shift its regulatory scope to focus on chemical producers and importers, which could allow the Agency to reduce its burden on small businesses and reduce supply chain disruptions and costs. The commenter stated that it will be difficult for the Agency to achieve its goal of regulating anyone who produces, imports, reclaims, repackages, or fills a container with a regulated substance used in servicing, repair, or installation of equipment by regulating at the wholesaler/distributor or contractor level. The commenter asserted that doing so would require extensive container tracking and reporting frameworks alongside enforcement mechanisms. The commenter claimed that since a majority of wholesalers and contractors are small businesses, EPA would have to complete EPA's Small Business Ombudsmen assessment. Additionally, the commenter claimed EPA would have to regulate over 1,000 wholesalers/distributors and 200,000 contractors, making enforcement more difficult. Additionally, the commenter stated that EPA would require significant support from industry, potentially delaying implementation.

Alternatively, the commenter stated that EPA should regulate reclaim at the producer/importer level. The commenter mentioned that chemical producers/importers are already regulated under the AIM Act, and that these entities already have established infrastructures to report sales, imports, production, and destruction of refrigerants. The commenter continued that regulating at the point of sale would make implementing reclaim requirements easier, reduce the number of companies that EPA would have to regulate, and allow for more effective communication and collaboration between EPA and the regulated entities. The commenter further noted that 14 companies control 89% of the consumption allowances and that eight of these 14 are reclaimers themselves, reducing the need for new infrastructure and investment. The commenter stated that this approach would also reduce the burden on small businesses.

Response: EPA disagrees with the commenter both on the small business impacts associated with recovering refrigerant and with how those impacts would be affected by the reclamation provisions. The Agency conducted a small business screening analysis and refers readers to section VI of this preamble and to Appendix G of the Economic Impact and Benefits TSD. The commenter did not provide sufficient information to explain how these provisions would divert resources from core operations and stifle innovation of the value chain. EPA considered supply chain and logistics when drafting the rule, including projections of future refrigerant supply. Based on these projections, EPA determined that finalizing requirements for the servicing and/or repair of refrigerant-containing

[118] 88 FR 46843, July 20, 2023.

equipment with reclaimed HFCs in the covered subsectors is feasible.

EPA responds to the commenter's suggestion to regulate reclaim at the producer/import level by noting that it is not clear to the Agency how such a regime would work in practice. The commenter provides information on the potential benefits of efficiency and a reduced number of regulated entities, but does not make clear statements how this program could work. The commenter States that the existing framework under 40 CFR 84 could simplify to implementation for point of sale for the reclaim requirements. However, it is unclear how the majority of reclaimers who are not importers or who do not receive allowances would operate under such a program for the effective implementation of the requirements for reclaimed HFC refrigerants for servicing and/or repair of refrigerant-containing equipment in certain RACHP sectors. Further, to the extent that this comment relates to proposed requirements that EPA is not finalizing at this time, EPA notes that it is not responding to comments on those aspects of the proposal in this final rule.

Comment: One commenter stated that to purchase "reclaim materials" in the market, a company would need to be an EPA-certified reclaimer; have reporting responsibility under EPA's HAWK (HFC and ODS Allowance Tracking) [119] electronic reporting system; demonstrate analytical chemistry and blending capabilities; avoid engaging in transshipping or various import schemes; demonstrate chain of custody ability; have a fleet of refillable cylinders; and maintain a physical reclamation facility in the United States. The commenter asserted that a company should not be engaged in simply drop-shipping refrigerants to actual EPA-certified reclaimers to control access to the market. Similarly, no company involved in market manipulation or illegal imports should be allowed to grow market share by forcing small reclaimers out of the market and purchasing their allowances. Given the increased emphasis the proposed rule places on the role of EPA-certified reclaimers, the commenter recommended that EPA develop enhanced requirements for reviewing the qualifications of certified reclaimers. The commenter noted that this process should also involve the inclusion of individuals on their hotline who are not reclaimers but are buying material.

Response: EPA acknowledges this comment. EPA understands the term "reclaim materials" to refer to recovered materials that are available to be reclaimed. The Agency appreciates these considerations, but notes that it is neither reopening nor modifying the criteria and qualifications for certification for reclaimers under 40 CFR part 82, subpart F in this rulemaking. EPA has established recordkeeping and reporting requirements for reclaimers under both the AIM Act and CAA section 608. In addition to these requirements, starting in 2024, EPA is requiring third-party auditing of EPA-certified reclaimers. Information related to the auditing of reclamation facilities can be found in 40 CFR 84.33.

Comment: One commenter recommended that EPA consider a mechanism that would allow negotiations between entities to fulfill reclaim requirements. The commenter stated that, for example, allowance holders of refrigerants, who may not want to manage reclaim operations or purchase reclaimed gas directly, could negotiate with another entity to take on CO_2 equivalent reclaim obligations, allowing smaller entities to participate in the reclaim program without significant investments in infrastructure or expertise. The commenter claimed that this would make the reclaim program more accessible and flexible for smaller allowance holders, promoting broader participation.

Response: EPA responds that EPA is not implementing a reclaim program based on CO_2 equivalency at this time. EPA notes that the established requirements in this rulemaking may result in some allowance holders purchasing reclaimed HFC refrigerants to service or repair their equipment in the covered RACHP subsectors; however, EPA does intend for all of these allowance holders to manage their own reclamation operations. Reclaimers, who in some cases are also allowance holders, are certified under 40 CFR 82.164. If an allowance holder who is not already a certified reclaimer wishes to manage their own reclamation operations, they would need to be approved by EPA to become a certified reclaimer.

The Agency understands the availability of advanced reclamation technology and describes some of these considerations in section IV.E.1 of this preamble, related to the reclamation standard. As EPA understands, some reclaimers have access to more advanced separation technologies to reprocess materials to proper specifications. These advanced technologies can be useful for reclaiming more complex and multi-component refrigerants blends. However, the Agency is establishing that reclaimed refrigerant may still contain an amount of virgin HFCs that may be necessary for reclaiming these blends. Further, the Agency is not establishing requirements for the initial fill of refrigerant-containing equipment with reclaimed HFCs in RACHP subsectors, including those where newer blends of refrigerants that are compliant with the 2023 Technology Transitions Rule would be used in new equipment. By limiting requirements for reclaimed HFCs to servicing and/or repair, EPA is focusing on existing equipment where more common HFCs and HFC blends have been used for years and are currently being reclaimed.

Comment: One commenter recommended that EPA put a per-pound deposit on regulated refrigerants that would be refunded when the substance is recycled. The commenter noted a potential downside due to the creation of a market for stolen refrigerant but noted that recordkeeping requirements would deter theft. The commenter suggested a balance between a price that could encourage recycling but not encourage theft and claimed that the cost would also support leak reduction measures. The commenter also recommended monthly reporting of refrigerants given the importance of the issue but noted a negative impact on consumers as the cost of reporting increases. The commenter recommended relying on market forces where possible and providing rewards for compliance.

Response: EPA did not propose and is not finalizing a refrigerant deposit program. If in the future, the Agency were to consider such a program, the Agency would evaluate the potential drawbacks of implementing such a program (such as the potential for fraud and increased recordkeeping or reporting burden) that could outweigh potential benefits. EPA notes that the requirements in the rulemaking have been established considering market conditions and other analyses as described in the Economic Impact and Benefits TSD for this rule.

Comment: Another commenter supported the provision in section 84.104(a) to prevent resale of reclaimed refrigerant for any purpose besides reclamation and recommended that there be explicit enforcement mechanisms. The commenter requested that EPA provide clearer guidance for

[119] EPA's HAWK electronic reporting system can be accessed through the Electronic Greenhouse Gas Reporting Tool (e-GGRT). Regulated entities that are subject to reporting requirements under the AIM Act submit reports this electronic reporting system.

what enforcement would entail under this rulemaking.

Response: EPA acknowledges this comment and notes that this provision is consistent with the statutory language in subsection (h)(2)(B) of the AIM Act, which provides that recovered regulated substances that are used as a refrigerant must be reclaimed before it is sold or transferred to a new owner, unless the recovered regulated substances are being sold or transferred to a new owner solely for the purposes of reclamation or destruction. As described above, under 40 CFR part 82, subpart F, recovered refrigerant may be recycled and used for servicing or repair of the same appliance or another appliance of the same owner. EPA clarifies that this rulemaking does not prevent that practice.

EPA notes that the provisions related to reclaimed refrigerant use for servicing and/or repair of certain equipment build on the established reclamation standard for limiting the virgin HFC content in reclaimed refrigerant to 15 percent, by weight. This requirement, as described in section IV.E.1 includes labeling, recordkeeping, and certification requirements to ensure reclaimed refrigerants are meeting the established standard. Certification must be provided to the purchaser of the reclaimed refrigerants to verify that the product does not exceed the limit on virgin HFCs. Thus, the purchaser can ensure that reclaimed HFCs are appropriately used to service or repair equipment in the covered subsectors of this rulemaking. Enforcement action may be taken where virgin HFC refrigerant is used for servicing or repairing equipment in the covered subsectors, where containers of refrigerant do not have the proper labeling for reclaimed refrigerants and records/certifications can be checked. Specific requests about what more information is being asked for has not been described by the commenter, and the Agency may consider issuing additional guidance in the future.

Comment: One commenter expressed concern that the proposed rule does not allow sufficient flexibility to spread reclaimed refrigerants across the entire market, allowing for potential circumvention in the aftermarket space. The commenter requested that EPA tailor reclaim requirements for sectors and end users to create a more flexible, practical, and achievable program. The commenter stated that reclaiming many newer refrigerants with HFO components is currently impractical and that EPA should proceed on a CO_2e net basis to allow producers to provide more virgin lower-GWP substances and offset them with higher-GWP substances, in order to ensure both the transition to low-GWP alternatives and continued reclaim activity and to encourage the responsible transition to low-GWP refrigerants without hindering the overall effectiveness of the reclaim program, with requirements implemented at the producer or importer level to streamline AIM Act reporting.

The commenter further stated that companies should be encouraged to recover low-GWP refrigerants by receiving GWP credit towards compliance requirements, incentivizing low-GWP recovery. The commenter requested that EPA allow companies to voluntarily reclaim and place on the market refrigerants exceeding the 2023 Technology Transitions Rule thresholds beyond their percentage reclaim requirements and receive GWP credits. The commenter claimed that these two measures would encourage a consistent culture of refrigerant management across the industry, reward companies for reclaiming, and pave the way for future regulations. The commenter additionally proposed that EPA consider requiring that businesses or persons offering refrigerant for sale or distribution for service must receive recovered refrigerant for reclaim in a ratio determined and updated by the Administrator, preferably based on CO_2 equivalents. The commenter stated that, if implemented at the wholesaler/distributor level, this could be audited using the proposed container tracking system.

Response: EPA acknowledges the commenter's interest in flexibility and in spreading the requirements to service and/or repair refrigerant-containing equipment with reclaimed HFCs across additional subsectors as well as their concerns for reclaiming blends with HFOs. As described above in section IV.E.1 of this preamble, EPA is establishing a limit of 15 percent, by weight, virgin HFCs in reclaimed HFC refrigerants. Further, EPA notes that it is not establishing a limit on the amount of virgin HFC substitutes that can be used in a reclaimed refrigerant blend and is thus not requiring reclamation of HFC substitutes. However, EPA recognizes that for HFC/HFO blends the commenter is likely referring to concerns with patents, licensing arrangements, and other business practices that may limit who can reclaim certain newer refrigerants. As discussed in a previous response in this section, the Agency is aware of these practices. However, the Agency has considered these concerns and made modifications to what it is finalizing in this rule that are intended to address these concerns with respect to provisions finalized in this rule. For example, EPA delayed the compliance date, which will allow regulated entities additional time to prepare to comply with the rule. Further, EPA is finalizing the requirement for servicing and/or repair with reclaimed HFCs for refrigerant-containing equipment in only three RACHP subsectors; EPA is not finalizing requirements for the initial fill of refrigerant-containing equipment with reclaimed HFCs or the proposed requirement for the servicing and/or repair of refrigerant-containing equipment in the stand-alone refrigeration subsector at this time. Existing equipment in the majority of cases currently uses HFCs or HFC blends that are common and are currently being reclaimed.

The Agency did not propose and is not finalizing a crediting system. Moreover, the 2023 Technology Transitions Rule sets GWP limits for certain new equipment and not for existing equipment where this rule will establish requirements for reclaimed HFCs. EPA did not reopen the 2023 Technology Transitions Rule in this rulemaking and is not making any changes to its requirements in this rule. EPA further notes that these requirements are not optional, and the Agency is not establishing a credit system that could be related to exceeding the requirements in those regulations. The Agency is requiring the servicing and/or repair of refrigerant-containing equipment with reclaimed HFCs in certain RACHP subsectors in the ER&R regulations established in this rulemaking. Moreover, EPA anticipates that there will be reclaimed refrigerant to meet demand for refrigerant servicing in the affected subsectors consistent with the compliance date, which may prevent the early retirement of existing equipment.

The Agency did not propose and is not finalizing refrigerant reclaim requirements on a CO_2e net basis. EPA acknowledges the comment on the use of a tracking system and notes that the Agency is not finalizing the proposed tracking system at this time.

Comment: One commenter stated that the supply of virgin refrigerants is far more plentiful than anticipated in 2021. The commenter stated that there seems to have been significant stockpiling, some amount of illegal imports, and significant growth in the import of products containing HFCs, with the value of imported air conditioning systems from Mexico increasing by approximately 50 percent from 2020 to 2022. The commenter noted that the allowance for Mexican refrigerant

extends to R–410A containing condensing units, which may currently be imported with no restriction other than a label for service consistent with the 2023 Technology Transitions Rule. The commenter stated that EPA could increase demand for reclaimed refrigerant by addressing this issue under the Technology Transitions Program. The commenter claimed that without these changes, it is unlikely that a transition away from R–410A will occur fully in the United States until 2034 when both countries are impacted by their phasedown schedules. The commenter also claimed that there will not be any significant demand for reclaimed refrigerant because of this legal allowance of imported products containing HFCs.

Response: EPA acknowledges these comments and concerns related to demand for reclaimed refrigerant due to the factors mentioned. EPA notes that this comment is out of scope for this rulemaking.

F. How is EPA establishing an HFC emissions reduction program for the fire suppression sector?

HFCs and substitutes for HFCs are used in many different sectors, subsectors, and applications beyond those in the RACHP sector, and EPA interprets its authority under subsection (h) to include promulgating regulations that control the types of practices, processes, or activities identified in subsection (h)(1) in those sectors, subsectors, and applications, with the limitation that the Agency does not interpret its regulatory authority under subsection (h) to extend to HFCs or substitutes for HFCs when they are contained in foams.

HFCs are also used in the fire suppression sector. EPA is establishing certain requirements to address HFC management for fire suppression under subsection (h), further described in section IV.F.2 of this preamble. EPA proposed and is finalizing requirements for the initial installation [120] and servicing and/or repair of fire suppression equipment to be done with recycled HFCs as well as requirements for minimizing HFC releases during the servicing, repair, disposal, or installation of fire suppression equipment; technician training; recycling of HFCs prior to the disposal of fire suppression equipment containing HFCs; and recordkeeping and reporting. EPA is finalizing a compliance date of January 1, 2026, for the following fire suppression requirements: (1) Minimizing HFC releases during the servicing, repair, disposal, or installation of fire suppression equipment; (2) the servicing and/or repair of fire suppression equipment to be done with recycled HFCs; (3) technician training; (4) recycling of HFCs prior to the disposal of fire suppression equipment containing HFCs; and (5) recordkeeping and reporting. EPA is finalizing a compliance date of January 1, 2030, for the requirement for the initial installation of fire suppression equipment to be done with recycled HFCs.

EPA notes that the finalized definition of ''fire suppression equipment'' for purposes of subsection (h) excludes military equipment used in deployable and expeditionary applications, as well as space vehicles. Those applications are exempt from the requirements to use recycled HFCs in the installation, servicing, and/or repair of such fire suppression equipment. This exclusion is based on EPA's understanding that there are situations in which the unique design and use of such military equipment and space vehicles make it impossible to recover fire suppression agents during the service, repair, disposal, or installation of the equipment. They are also exempt from the requirement to use recycled HFCs for the initial installation of equipment and for the servicing and/or repair of equipment.

Application-specific HFC allowances are available to mission-critical military end uses as well as on board aerospace fire suppression [121] applications under regulations at 40 CFR 84.13. EPA is not extending the requirement to use recycled HFCs in the installation, servicing, and/or repair of such fire suppression equipment provided that they meet the requirements for application-specific allowances in 40 CFR 84.13. As long as they meet the requirements for application-specific allowances, these applications are also exempt from the requirement to use recycled HFCs for the initial installation of equipment and for the servicing and/or repair of equipment.

1. Nomenclature Used in This Section

This section uses the term ''recycled'' or ''recycling'' to describe the testing and/or reprocessing of HFCs used in the fire suppression sector to certain purity standards.[122] HFCs that are recycled for fire suppression use include HFC–227ea, HFC–125, HFC–236fa, and HFC–23. The term ''recycled'' or ''recycling'' as used in the fire suppression sector is similar, but not identical, to the term ''reclaim'' as defined under the AIM Act. Under the AIM Act, the terms ''reclaim; reclamation'' are defined in subsection (b)(9) of the Act, and that definition refers to the purity standards under AHRI Standard 700–2016 (or an appropriate successor standard adopted by the Administrator) and the verification of purity using, at a minimum, the analytical methodology described in that standard.

The fire suppression industry describes clean agent as ''a gaseous fire suppressant that is electrically nonconducting and that does not leave a residue upon evaporation,'' and the term ''clean agents'' includes HFCs, according to the National Fire Protection Association (NFPA).[123] For the purposes of this section, EPA is generally referring to the term ''clean agents'' as HFCs. While the term ''fire suppressants'' may have a broader meaning, including non-gaseous agents for example, EPA generally views the terms ''fire suppressants'' and ''fire suppression agents'' as interchangeable for the purposes of this section.

2. Emissions Reduction in the Fire Suppression Sector

As part of implementing subsection (h)(1), EPA is finalizing a number of requirements to minimize releases of HFCs during the servicing, repair, disposal, or installation of fire suppression equipment containing HFCs or during the use of such equipment for fire suppression technician training. These requirements are similar to the halon emissions reduction requirements found at 40 CFR part 82, subpart H. The fact that recycled halons have been the only supply of halons in the United States 30 years after its production and consumption phaseout in 1994 demonstrates the important role recovery and recycling of clean agents from fire suppression equipment can

[120] EPA understands these terms ''initial installation,'' ''initial charge,'' or ''initial fill'' to be synonymous when discussing fire suppression equipment to done with recycled HFCs.

[121] On board aerospace fire suppression is defined at 40 CFR 84.3.

[122] These industry standards may include NFPA 2001 (Standard on Clean Agent Fire Extinguishing Systems), NFPA 10 (Standard for Portable Fire Extinguishers), ASTM D6064–11 (Standard Specification for HFC–227ea), ASTM D6231/D6231M–21 (Standard Specification for HFC–125), ASTM D6541–21 (Standard Specification for HFC–236fa), and ASTM D6126/D6126M–21 (Standard Specification for HFC–23).

[123] National Fire Protection Association, NFPA Today, May 6, 2022, *https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/NFPA-Today/Blog-Posts/2022/05/06/Clean-Agent-System-Basics.*

play by providing an ongoing supply where substitutes may not be suitable. As discussed in the proposal, EPA understands that this model has carried over on a voluntary basis to the management of HFCs by many in the fire suppression sector.

a. Minimizing Releases of HFCs

To minimize releases of HFCs, EPA is requiring that covered entities installing, servicing, repairing, or disposing of fire suppression equipment containing a regulated substance may not release into the environment, such as by intentional venting, any HFCs used in such equipment. EPA is also requiring that owners and operators of fire suppression equipment containing HFCs not allow the release of HFCs as a result of failure to maintain such equipment.

Recognizing the extensive requirements for testing (*e.g.,* Federal Aviation Administration, United States Coast Guard, Department of Defense) associated with the approval for use of fire suppressants in certain applications, certain limited HFC releases for health, safety, environmental, and other considerations are exempted, including:

- Releases during the testing of fire suppression equipment only if the following four criteria are met: (1) Equipment employing suitable alternative fire suppressants is not available, (2) release of fire suppressants is essential to demonstrate equipment functionality, (3) failure of the equipment would pose great risk to human safety or the environment, and (4) a simulant agent cannot be used in place of the regulated substance for testing purposes.
- Releases associated with qualification and development testing during the design and development of equipment containing regulated substances only when (1) such tests are essential to demonstrate equipment functionality, and (2) a suitable simulant agent cannot be used in place of the regulated substance for testing purposes.

In addition, these requirements to minimize HFC releases do not apply to emergency releases of HFCs for actual fire extinguishing, explosion inertion, or other emergency applications for which the equipment was designed.

Below, EPA is responding to comments related to its approach and requirements to minimize releases of HFCs from the fire suppression sector.

Comment: Several commenters expressed support for the requirements to reduce HFC emissions from the fire suppression sector. One of the commenters stated that the proposed requirements are akin to the 1998 halon emissions reduction requirements. The commenter stated that the fire suppression sector has developed several voluntary measures to decrease emissions, such as the voluntary code of practice (VCOP) and the voluntary recycling code of practice, and that these voluntary programs and the industry's experience in recycling halons provide the infrastructure necessary for the success of the HFC recycling requirements in EPA's proposal. The commenter also maintained that the required use of recycled HFCs is important in mitigating emissions and encouraging the use of other alternatives due to the high-GWP HFCs typically used in the fire suppression sector. Another commenter stated that the fire suppression industry fully supports EPA's goals of minimizing emissions of HFCs and encouraging the recycling and reuse of HFCs. The commenter stated that as a companion to the VCOP, an HFC emissions estimating program (HEEP) was developed that collects data on sales of HFCs for recharge of fire protection equipment as a surrogate for emissions. The commenter stated that compiled data of estimated emissions of HFCs from fire protection equipment have been submitted to EPA and published each year since 2002. Another commenter generally supported exploring potential practices that can help expand HFC recycling and reduce GHG emissions, while expressing concern with whether there is a sufficient supply of recycled HFCs for use in fire suppression systems.

A couple of commenters stated that the proposed requirements of 40 CFR 84.110(a), (b), (d), (e), and (f) are similar to the halon emission reduction requirements found at 40 CFR part 82, subpart H. One of the commenters stated that the halon emission reduction requirements have proven to be effective and useful in the responsible management of fire suppressants and that these practices are commonplace in the fire protection industry and are incorporated into industry codes and standards. Another commenter commended EPA for basing the requirements for HFC management in fire suppression equipment on the halon emission reduction rule, as these practices are commonplace within the fire protection industry and incorporated into industry codes and standards. The commenter expressed support for the prohibition in 40 CFR 84.110(a) against knowingly venting HFCs in the installation, servicing, repair, or disposal of fire suppression equipment. The commenter stated that the proposed exemptions for testing fire suppression equipment and qualification testing during system design and development are appropriate. The commenter also expressed support for the prohibition in section 84.110(b) against allowing release of HFCs as a result of failure to properly maintain equipment.

Response: EPA acknowledges the commenters' general support of the fire suppression requirements, and that the Agency considered the fire suppression industry's past experience with recycled halons as well as their voluntary efforts with recycled HFCs to develop fire suppression requirements that complement current industry practices to minimize emissions of HFCs.

Comment: A commenter recommended a stricter set of terms and greater consistency in alignment between industry groups represented in subsection (h), including the fire suppression industry and the RACHP industry. The commenter expressed support for the proposal to align requirements for recyclers of fire suppression or refrigerant-based systems to meet the same rigid standards as EPA's CAA section 608 certified reclaimer program. The commenter maintained that voluntary practices do not require the level of recycling, such as the need for reclaim, so recycled HFCs sourced from fire suppression applications "could act to undermine the integrity and quality of the refrigerant supply chain." The commenter stated that the marketplace should be able to expect the same quality, rigor, and tracking as proposed for refrigerants in the rulemaking.

Response: The Agency considers the fire suppression sector and the RACHP sector as distinct sectors with unique specifications and experiences; thus, the requirements established for each sector are tailored to that sector. EPA understands that entities in the U.S. fire suppression industry typically operate in accordance with requirements from NFPA 2001 [124] or NFPA 10 [125] or appropriate American Society for Testing and Materials (ASTM) standards to recover and recycle HFCs during servicing and/or repair of fire suppression equipment. None of these current industry standards or specifications related to HFCs used in

[124] NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems. Available at: *https://www.nfpa.org/codes-and-standards/nfpa-2001-standard-development/2001.*

[125] NFPA 10 Standard for Portable Fire Extinguishers. Available at: *https://www.nfpa.org/codes-and-standards/nfpa-10-standard-development/10.*

fire suppression contain specific requirements to minimize releases of HFCs, including during servicing or repair of the equipment. Therefore, and as noted by the commenter, efforts by the industry to minimize emissions of HFCs used in the fire suppression sector have to date been on a voluntary basis. For example, the VCOP includes as part of its emission reduction strategies during storage, handling, and transfer of HFCs to recover and recycle agents during servicing and to adopt maintenance practices that reduce leakage as much as is technically feasible. By adopting regulatory requirements informed by these current voluntary practices and relevant industry standards, this action will minimize emissions of HFCs more broadly within this sector of where HFCs are used, consistent with the purposes identified in subsection (h), and in a manner that maintains the integrity of recycled HFCs from this source.

b. Requirements for Initial Installation of Equipment for Fire Suppression

EPA is requiring for the fire suppression sector where HFCs are used, that the initial installation of fire suppression equipment, including both total flooding systems and streaming applications, must be with recycled HFCs, starting on January 1, 2030. Specifically, for factory-charged equipment that uses HFCs, EPA is requiring that in order to install such equipment, the equipment is required to use recycled HFCs for the initial installation during the manufacture of the equipment. These requirements apply whether the HFCs are used neat or in a blend.

However, EPA notes that most often, where fire suppression agents are needed and HFCs are being used, these are single component HFCs with some of the highest GWPs for the regulated HFCs. Given the high GWPs for the commonly used HFC fire suppression agents, this aspect of the action is anticipated to further minimize emissions by requiring that recycled HFCs be used for the initial installation of fire suppression equipment.

Currently, recycled HFCs are primarily used for the servicing and recharge of existing fire suppression equipment. EPA understands that, in practice, recycled HFCs are required to meet applicable purity standards and function the same as their virgin counterparts when used in equipment in the fire suppression sector.

Comment: One commenter expressed support for EPA's proposal to increase the use of reclaimed and recycled HFCs in new and existing HFC-containing fire suppression equipment. Some commenters expressed concern with the requirement to use recycled HFCs for the initial installation of fire suppression equipment. One of these commenters stated that the requirement to use recycled HFCs for the first fill of fire suppression equipment should not be included in the final rule. The commenter also stated that there is uncertainty in whether the supply of recycled HFCs will be adequate to serve new and existing equipment. The commenter questioned the appropriateness and necessity of the requirement to use recycled HFCs for the initial fill of fire suppression equipment. Additionally, the commenter stated that during meetings with EPA staff and in the public stakeholder meeting, no indication was given that initial fill of equipment would be regulated in this rule, as the commenter understood that the technology transition section of the AIM Act was the appropriate place for such proposed regulations.

Another commenter stated that the proposed requirement to use only recycled HFCs for the initial fill is not supported based on the historical success of halon recycling. The commenter stated that the current market for clean agent fire systems and the need for virgin HFCs are very different from the historical halon market. The commenter stated that they are a contributor to this success and suggested that EPA should not equate the current HFC market with that of halon given important differences between halons and HFCs and their use patterns. Specifically, the commenter stated that recycled halon has been made available for redeployment by a steady system of replacement with HFCs on a comparable performance basis, while current non-HFC replacement fire technologies provide many challenges to comparable replacement, extending the lifetime for HFC fire systems to remain in place, and reducing the availability of material to be recycled. The commenter also maintained that installed halon systems are significantly older than HFC systems, and that the accelerated changes in facilities and technologies being protected make many of these halon installations obsolete, providing sufficient stocks for recycling. The commenter provided an example that shipbreaking of aged vessels is a significant halon source for which there is no HFC equivalent. Additionally, the commenter stated that halon recovery and recycling is active and viable on a global basis and the United States receives significant quantities of halon from non-domestic sources, while non-domestic HFCs for recycling will require AIM Act allowances limiting their viability to relocate to the U.S. market, requiring a domestic bank of installed HFC to support requirements for both service and new systems. However, the commenter stated that most installed HFC fire systems are protecting viable ongoing facilities with no anticipated need to convert or retrofit to alternate technologies, reducing the available resource bank.

Response: In response to the comment's assertions that there was no notice in public meetings of an intent to cover initial fill or installation, EPA notes that the proposed rule provided notification of the Agency's intention to include both initial installation and servicing requirements (88 FR 72216, October 19, 2023). EPA disagrees with the commenter's assertion that it should not draw parallels between the experience with recycled halons and with recycled HFCs. There are numerous similarities between the use of halons and the use of HFCs for fire suppression. This includes the supply chain, the types of applications and equipment, and general industry practices. Recycled halon is still available today, 30 years after the United States phased out production and consumption of halons. It is this experience, since the phaseout of the halons in 1994, that demonstrates the important role recovery and recycling of fire suppression agents can play by providing an ongoing supply of HFCs in fire suppression applications especially where other substitutes may not be suitable. EPA understands that this model has carried over on a voluntary basis to the management of HFCs by many in the fire suppression sector.

In response to the comments questioning the appropriateness and necessity of the requirement for initial installation of fire suppression equipment with recycled HFCs, EPA views the requirement to use of recycled HFCs for the initial installation of fire suppression equipment as part of its efforts to minimize emissions of HFCs from equipment, consistent with one of the purposes identified in the Act for regulations under subsection (h). EPA notes that most often, where fire suppression agents are needed and HFCs are being used, these are single component HFCs with some of the highest GWPs for the regulated HFCs. Given the high GWPs for the commonly used HFC fire suppression agents, this provision will further minimize emissions by requiring that only

recycled HFCs be used in fire suppression equipment as well as ensuring that HFCs have been recovered and recycled from the equipment prior to the final step of the disposal of the equipment so that HFCs are not released during the disposal of the equipment. EPA understands that, in practice, recycled HFCs are required to meet applicable purity standards and function the same as their virgin counterparts when used in equipment in the fire suppression sector. Currently, recycled HFCs are primarily used for the servicing and recharge of existing fire suppression equipment. Comments by Halon Alternatives Research Corporation (HARC) on the October 2022 NODA indicate that it does not anticipate major barriers to using recycled HFCs in new fire suppression equipment. EPA understands while there may not be barriers to using recycled HFCs in new fire suppression equipment, commenters have stated that there may be uncertainty in the supply of recycled HFCs. EPA acknowledges the need for allowances to import recycled HFCs for fire suppression, however the Agency anticipate that as the HFC Phasedown progresses, HFCs no longer needed in larger uses such as refrigeration and air conditioning may become available for fire suppression applications. Informed by comments, EPA acknowledges that commenters expressed concerns regarding the supply of recycled HFCs and is extending the compliance dates for the use of recycled HFCs to ensure that the infrastructure and supply will be available for affected stakeholders to be able to comply with requirements, further described later in this section IV.F.2.b of this preamble.

With regards to the sourcing of used HFCs, the comments concerning the need for allowances are outside the scope of this rulemaking. In this section IV.F.2.b of the final rule, the comments regarding the RACA process, are also beyond the scope of this action and thus require no further response, as EPA has proposed no changes to the requirements of the RACA process.

Comment: One commenter stated that their support for the AIM Act was based on there being a phasedown of HFC production, not a complete phaseout. The commenter stated that EPA's proposal is equivalent to an HFC phaseout for fire protection in the United States, stating that they did not believe that it was appropriate or necessary for EPA to regulate initial fill of fire suppression equipment in this rule. The commenter also stated that it would put HFCs domestically in a more restrictive position than halons and CFCs, as these chemicals can be imported without the expenditure of allowances. In addition, the commenter stated that due to the high-GWP nature of HFCs used for fire protection, the observed effect of the AIM Act has been to reduce the production and consumption of virgin HFCs in the sector, below the phasedown schedule, and that companies have obtained the required listings and approvals so that a transition to the use of recycled HFCs in new fire suppression systems is underway. The commenter expressed a view that they would expect this transition to occur naturally and expand as the phasedown proceeds and claimed that it was not environmentally justified to force this transition on the industry by regulation in what in their view is a short time frame.

Another commenter asserted that the proposed requirements for use of recycled HFCs for initial fill and recharge, would, in effect, ban the production of fire suppression HFCs as of January 1, 2025, and it would mean there would be no commercial market for virgin fire suppression HFCs, since any use of the agents (other than in extremely limited essential uses) would be illegal. The commenter contended that the AIM Act implements the phasedown under the Kigali Amendment to the Montreal Protocol and does not authorize EPA to issue a rule that results in a total ban on the production and consumption of HFCs, including fire suppression HFCs, and therefore that the proposed rule is not authorized by the AIM Act.

This commenter also stated that the proposed rule also violates the accelerated schedule provision of the AIM Act (42 U.S.C. 7675(f)). This commenter maintained that the proposed fire suppression requirements would result in a total ban on the production and consumption of virgin fire suppression HFCs as of January 1, 2025, which would be more stringent than the phasedown schedule under subsection (e)(2)(C) of the AIM Act. Thus, they asserted that establishing an effective total ban on the production and consumption of virgin fire suppression HFCs as of that date would require rulemaking following receipt of a petition as specified in subsection (f) of the AIM Act. The commenter also stated that the proposed requirement to use only recycled HFCs for initial fill is not supported based on the historical success of halon recycling, due to important differences between halons and HFCs and their use patterns. For example, the commenter stated that an important difference between HFCs and halons is their relative firefighting effectiveness. The commenter stated that halons, bearing no blanket import restrictions, were successfully funneled into reuse under a production phaseout due to halon's uniquely effective fire extinguishing properties. The commenter further stated that market forces in critical applications like aerospace consistently supported a recycle market, maintaining sufficient value to drive recycling activity. The commenter maintained that HFCs do not have the same level of market pull to support recycling activity in a market that immediately accelerates the sunset of virgin material for initial fill versus the anticipated phasedown schedule supported by the AIM Act framework rule.

Response: EPA disagrees with the commenters' assertion that finalizing these requirements under subsection (h) regarding recycled fire suppression agents is a phaseout of HFCs or an acceleration of the phasedown under subsection (f) of the AIM Act. EPA further disagrees with the commenters' conclusion that these requirements are not authorized under the AIM Act.

While the AIM Act includes provisions related to the phasedown of production and consumption of HFCs, including the provisions in subsections (e) and (f) of the Act, it also includes separate and additional regulatory authorities, such as those in subsection (h) of the Act. As explained in detail throughout, this rule is promulgated under subsection (h) of the AIM Act, not subsections (e) or (f). Subsection (h) uses different language from subsections (e) and (f), and it is framed differently. EPA interprets Congress' direction under these subsections as different and as providing distinct authorities that are tailored to the respective areas of focus of these subsections, so that EPA can establish regulatory regimes that effectively achieve each subsection's purposes. For example, subsection (e)(1)(A) directs EPA to establish production and consumption baselines "for all regulated substances in the United States," and subsection (e)(2)(B) describes the methodology for determining the quantity of regulated substances that may be "produced or consumed in the United States" in a particular calendar year by multiplying the percentage listed for that year in subsection (e)(2)(C) by the production or consumption baseline. EPA's implementing regulations for these provisions establish limits on the "[t]otal production and consumption of regulated substances in the United States in each year" (40 CFR 84.7) that apply to HFC production and consumption in the United States on an

economy-wide basis. Subsection (f) addresses the EPA Administrator's authority to "promulgate regulations that establish a schedule for phasing down the production or consumption of regulated substances that is more stringent than the production and consumption levels of regulated substances required under subsection (e)(2)(C)" and the requirements for such regulations. The comment does not provide any data or analysis that indicates that the requirements to use recycled fire suppression agents in this rule would alter the phase down schedule established under subsection (e)(2)(C). EPA codified numeric levels of permissible production and consumption in 40 CFR 84.7(b)(3), Table 2. EPA did not propose and is not taking any action in this rulemaking that would change the economy-wide phasedown schedule established in subsection (e)(2)(C) or the numeric levels of permissible production and consumption codified in 40 CFR 84.7(b).[126] The production and consumption phasedown is implemented on an exchange value-weighted basis (rather than establishing caps for particular HFCs), and this rule does not alter the amount of HFC production and consumption allowed in any year on an exchange value-weighted basis, nor does it alter the number of allowances that EPA will allocate in a future year. Further, it does not prohibit any production or import of any HFC. HFCs affected by the rule's requirements to use recycled fire suppression agent are not exclusively used for fire suppression.

In contrast to the focus on the phasedown of production and consumption in subsections (e) and (f), subsection (h) is targeted at management of regulated substances. As relevant here, subsection (h)(1) directs EPA to "promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment" that involves a regulated substance, for purposes that include minimizing releases of HFCs from equipment. This final action is an appropriate use of EPA's authority under subsection (h), as requiring the servicing, repair, and installation of fire suppression equipment with recycled HFCs at a set date in the future is exactly the type of activity that the AIM Act envisions in subsection (h) since the requirements are controlling practices, processes, and activities regarding the servicing, repair, disposal, and installation of fire suppression equipment that involves a regulated substance.

To the extent these commenters contend that these requirements would in effect ban the production or consumption of fire suppression HFCs, that is a mischaracterization of the requirements of the rule. These requirements involve the practice or activity of using recycled HFCs to service, repair, and install fire suppression equipment, with different compliance dates for existing and new equipment, and thus also control the practice or activity of using of virgin HFCs during these activities in fire suppression equipment. However, even if the requirements result in virgin HFCs no longer being used to service, repair, and install fire suppression equipment, that is not a ban on production or consumption of HFCs, as those are distinctly defined terms under the AIM Act. Requiring this practice or activity is appropriate under subsection (h). There is availability of recovered and reprocessed HFCs that can be used for this purpose. While opposing the time frame of the proposed rule, one commenter indicated that the transition to recycled HFCs in fire suppression is underway and would expand as the phasedown proceeds. Further, this provision will foster additional recycling of these HFCs and thus fewer emissions of HFCs from this equipment, consistent with the purposes identified in subsection (h).

EPA acknowledges that while there are numerous similarities, there may be certain market and efficacy differences between halons and HFCs, such as halons not requiring expenditure of allowances as described earlier in this section. Since 1994, with the phaseout of the production and consumption of halons, recycled halons have been available and are still available today, which demonstrates the important role recovery and recycling of fire suppression agents can play by providing an ongoing supply of HFCs in fire suppression applications, especially where substitutes may not be suitable. As discussed in the proposal, EPA understands that this model has already been carried over on a voluntary basis to the management of HFCs by many in the fire suppression sector. In 2002, the fire suppression industry developed a VCOP for the reduction of emissions of fire suppression agents including HFCs. The VCOP was developed by HARC, an industry organization, in partnership with EPA, the Fire Suppression Systems Association (FSSA), the Fire Equipment Manufacturers Association (FEMA), and the National Association of Fire Equipment Distributors (NAFED). Many of the practices have already been voluntarily adopted by the fire suppression sector, such as equipment manufacturers or distributors. In EPA's view, the fire suppression requirements will benefit from and bolster these efforts. While EPA notes that the commenter did not think HFC extinguishants would have the same market demand that supports halon recycling, the Agency views VCOP as an example of this industry already significantly supporting HFC recycling and reuse of fire suppression agents and understands that with the extended compliance dates, it would provide the market time to adjust. EPA acknowledges that HFCs are not used in all of the same applications as halons for various reasons and for the near term those applications will continue to rely on the over 30-year practice of recycling and reusing halons. EPA considers the longstanding and highly successful use of recycled halons for both installation and servicing of fire suppression equipment in the United States to be a premier example of the effectiveness of relying on recycling.

The Agency responds to the comments regarding the compliance timelines to meet these requirements by noting that EPA is finalizing compliance dates for the initial installation with recycled HFCs (beginning January 1, 2030) and for servicing and/or repair with recycled HFCs (beginning January 1, 2026) of fire suppression equipment, as described in more detail in sections IV.F.2.b and IV.F.2.c of this preamble.

Comment: One commenter mentioned that the final rule should preserve the ability to use substitutes for initial installation and servicing/repair of fire suppression equipment. The commenter stated that the proposed regulatory language could be read to suggest that only recycled regulated substances, and not their substitutes, could be used to fill and/or service fire suppression equipment. The commenter stated that this result was likely unintended because it overlooks the potential use of HFC substitutes in fire suppression equipment, which in some cases may be more environmentally friendly than recycled HFCs. The commenter requested that EPA amend 40 CFR 84.110(c) to clarify that fire suppression equipment must be initially charged and serviced with recycled HFCs or allowable HFC substitutes, as such substitutes become available on the market.

[126] As this rule does not prohibit any production or consumption of HFCs, EPA need not and is not further addressing the comment's assertion that the AIM Act does not authorize EPA to issue a rule that results in a total ban on the production and consumption of HFCs, including fire suppression HFCs.

Response: EPA did not propose and is not finalizing requirements for the use of recycled HFC substitutes in fire suppression equipment at this time. EPA notes that nothing in this final rule impedes the use of fire suppression alternatives. EPA determined that it is prudent to limit the requirements to HFCs, noting that the consumption and production phasedown will create scarcity for certain HFCs and such demand should partly be addressed by the increased use of recycled HFCs. The Agency acknowledges the importance of HFC substitutes and encourages the development and deployment of HFC substitutes to the extent possible. EPA also recognizes that in the context of a phasedown, certain uses of HFCs will continue indefinitely.

Comment: A commenter mentioned that because the Federal Aviation Act and controlling case law interpreting the Act reserve to the FAA primary jurisdiction over matters related to aircraft safety and operations, requirements related to passenger aircraft air conditioning and fire suppression equipment necessarily falls within the purview of FAA's authority and therefore cannot be infringed upon by EPA. The commenter also states that more important than any jurisdictional considerations, any acknowledged threat to passenger safety is unacceptable as a regulatory requirement, and notes that a lack of meaningful coordination with the FAA could result in a failure to ensure that air safety is the top consideration when determining applicability of the proposed rule's requirements to the commercial aviation sector. The commenter expressed support for EPA's proposed exemption for onboard aerospace fire suppression systems from the requirement to use recycled HFCs and recommended that the exemption be expanded to hangar fire suppression systems. The commenter also requested the broadest application possible for this proposed exemption given the potentially lengthy process for FAA approval of such products and their potential to impact the safe operation of aircraft.

The commenter stated that the proposed rule does not appear to contain a similar exemption from the requirement to use recycled HFCs for fire suppression systems in hangars. The commenter stated that hangar fire suppression systems are highly specialized, and mandating that new and existing hangar fire suppression systems use recycled HFCs could be incredibly costly for their members and potentially disruptive to safe and smooth commercial aviation operations. The commenter also stated that such a requirement for hangars must also go through the FAA consultation process to ensure that any final requirements that may apply to the commercial aviation sector and its ground facilities do not jeopardize safety or the smooth and efficient operation of the commercial aviation industry when planes are in the air and on the ground.

Response: EPA disagrees with the commenter's broad assertions that EPA does not have authority to issue regulations pertaining to HFCs in aircraft and aircraft operations. While EPA agrees that the FAA has jurisdiction over matters related to aircraft safety and operations consistent with its Congressionally mandated authorities, under CAA title VI and the AIM Act, EPA has issued numerous regulations that concern the use of ODS and HFCs in many applications including onboard aviation and flight operations. With respect to this action, the AIM Act does not exclude aircraft or aircraft operations from the scope of implementing regulations. As noted previously in this notice, the inclusion in the statute at subsection (e)(4)(b)(iv) of "on board aerospace fire suppression," which includes aircraft, indicates that Congress did not intend to exempt aircraft and aircraft operations from the AIM Act. In addition, the commenter does not address the provisions of subsection (h) itself. None of the text of subsection (h) indicates that Congress contemplated that these provisions would not apply to equipment used in commercial aviation. Congress expressly addressed inapplicability of regulations under (h) in subsection (h)(4), in which it provided that regulations under subsection (h) shall not apply to HFCs or their substitutes contained in foams. If Congress had intended to exclude equipment used in commercial aviation from regulations promulgated under subsection (h), it would be reasonable to expect that the statute would include similar language creating that exclusion. Although the commenter did not appear to base objections on the text of subsection (h), to the extent they intended to argue that this rulemaking exceeds EPA's authority under that provision, EPA notes that it is establishing the subsection (h) requirements in this final rule to control practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance or a substitute for a regulated substance and to serve the statutory purposes identified in subsection (h). Thus, this final rule is within the scope of EPA's authority under subsection (h)(1), including as it pertains to equipment used in commercial aviation. Further, as discussed above, EPA is not extending the requirements for recycled HFCs under this rule to on board aerospace fire suppression applications, as listed at previously finalized EPA regulations at 40 CFR 84.13, for a year or years for which that application receives an application-specific allowance as defined at § 84.3.

With regard to the commenters' assertions that finalizing the proposed rule would conflict with the Federal Aviation Act's statutory purpose and scheme and that this statute reserves to the FAA jurisdiction over matters related to aircraft safety and operations and broadly preempts the field of regulation with respect to commercial aviation, aircraft operations, and aircraft safety, EPA responds that the information presented in the comment letter does not indicate that EPA is generally precluded from including requirements related to the commercial aviation sector in this rulemaking. The comment cites and quotes cases that speak to the pervasive nature of Federal regulation in this area and address the preemption of State and local regulations. However, preemption of State and local laws is not relevant to EPA's authority to establish regulations.

In response to the commenter's assertions that EPA did not consult with the FAA on these regulations, particularly for any fire suppression requirements that may apply to the commercial aviation sector, the Agency notes that it reached out to FAA on certain topics in developing the draft final rule prior to interagency review.[127] Further, FAA and other Federal agencies had an opportunity to review a draft of the final rule during interagency review.

EPA also disagrees with the commenter that hangars or ground facilities are not subject to this rule and should be exempted. EPA is not requiring the initial installation or servicing and/or repair of fire suppression equipment with recycled HFCs in certain applications that receive application-specific allowances, including mission-critical military end uses and on board aerospace fire suppression. On board aerospace fire suppression is one of the six applications listed in the AIM Act that allows companies that use HFCs to receive application-specific allowances.

[127] See memo titled *EPA Questions to FAA,* which is available in the docket for this rulemaking, EPA–HQ–OAR–2022–0606.

Specifically, as defined in EPA's implementing regulations at 40 CFR 84.3, on board aerospace fire suppression means use of a regulated substance in fire suppression equipment used aboard commercial and general aviation aircraft, including commercial-derivative aircraft for military use; rotorcraft; and space vehicles. Onboard commercial aviation fire suppression systems are installed throughout mainline and regional passenger and freighter aircraft, including engine nacelles, auxiliary power units, lavatory trash receptacles, baggage/crew compartments, and handheld extinguishers. As such, hangars or ground facilities do not fall under this purview.

Comment: The Agency also received comments regarding the supply of recycled HFCs. One commenter stated that while they mentioned that there are no barriers to using recycled HFCs for initial fill, they provide no information that could be used to conclude that the supply of recycled HFCs is adequate to serve new and existing equipment. The commenter also stated that their concern is not currently when the supply of recycled HFCs may be high, but five to ten years in the future, when there may still be a significant installed base of HFC-containing equipment. Another commenter maintained that recycled HFCs have been used for years to recharge most fire systems in the event of discharge, and that historically the availability of recycled HFCs has balanced well with the nominal requirements for system service. The commenter stated that there are not sufficient recycled HFCs available to the market to confidently supply all domestic fire suppression needs for both service and new systems now and into the future. The commenter also stated that the lack of sufficient available fire suppressants to meet crucial fire suppression needs will put critical facilities, and the people who work in those facilities, at risk of harm from fire events and reduce market confidence in the use of fire suppression technologies for special hazard applications. The commenter also stated that the remaining need for HFCs in new systems in the United States is due to a lack of viable alternatives for meeting very challenging technical requirements for special hazard fire systems. The commenter maintained that implementing the rule as proposed will make providing effective fire suppression more difficult for these applications without providing a meaningful impact on emissions associated with the use of HFCs in fire suppression.

Another commenter stated that while there is a robust recycling market in the fire suppression industry, there is concern that the availability of recycled HFCs would not always balance market demand under the proposed rule requirements. Instead, the commenter suggested that the availability of recycled HFCs would adjust to balance the required market needs given time under the current AIM Act rule structure. The commenter stated that the required use of recycled fire suppression agent would be unnecessary and counterproductive to the existing market-driven activities in the fire suppression industry.

One of the commenters expressed concern over whether the proposed requirements would ensure that there is a sufficient supply of recycled HFCs available for use in fire suppression systems, especially for hangars. The commenter stated that if EPA intends for hangars to be covered by the proposed fire suppression system requirements, it is imperative that the requirements ensure that a sufficient supply of recycled HFCs would be available so that industry sectors would have a sufficient supply of necessary materials to ensure safe operations while also complying with any applicable regulatory requirements.

Response: EPA acknowledges comments related to the supply of recycled HFCs to support the requirements for recycled HFCs in fire suppression equipment established in this rulemaking. EPA understands that the fire suppression industry has been generally using recycled HFCs for servicing (as shown in the HEEP data).

EPA acknowledges that the phasedown of production and consumption of HFCs under the AIM Act and Kigali Amendment to the Montreal Protocol will have broader impacts on HFC use and transition to HFC substitutes. In the context of the HFC phasedown, not establishing requirements to limit the release of HFCs will create supply issues as the phasedown progresses. As addressed elsewhere in this preamble, this final rule is being promulgated under subsection (h). EPA acknowledges the comments regarding the current market structure of the fire suppression industry with respect to the use of recycled HFCs. EPA notes that the provisions established in this rulemaking are intended to support increased recycling and further bolster the supply of recycled HFCs. As the phasedown progresses, other sectors that use certain HFCs may reduce their use of certain HFCs or no longer use certain HFCs, which may be become available for use in the fire suppression sector. After further consideration, EPA agrees that additional time is warranted, this will enable the fire suppression sector to build up additional stock of recycled HFCs to meet demand for the installation, servicing, and/or repair of fire suppression equipment and to adjust any relevant existing contracts. The date for the requirement for the initial installation of fire suppression equipment with recycled HFCs is after the next major phasedown step of production and consumption of virgin HFCs under the AIM Act, when recycled HFCs will play an even greater role in supporting the servicing and repair of existing equipment. The commenters pointed to the need for additional time for the market to further adjust supply and demand for recycled fire suppression agents. Thus, EPA is finalizing later compliance dates than proposed for the initial installation and the servicing and/or repair of fire suppression equipment with recycled HFCs, as described in more detail in sections IV.F.2.b and IV.F.2.c of this preamble. The Agency is also finalizing differentiated dates for servicing and initial installation, with the date for servicing earlier than initial installation based on commenters' information on current practices.

Comment: One commenter stated the proposed requirement to only use recycled HFCs for initial fill will disrupt the current market-driven balance of recycled agent supply and demand, impacting the AIM Act's important environmental goals. The commenter stated that the 2020 HEEP data show recycled HFCs currently support the preponderance of system service requirements (80 percent in 2020), providing a viable and responsible life cycle process and market-driven balance. The commenter claimed, however, that the proposal requiring the use of recycled HFCs for initial installation would have the effect of reinforcing the market perception that HFCs are being regulated out of existence. The commenter stated that the EU's 2000 regulation devalued halon 1301 and that the regulation correlated with the EU halon emissions. The commenter voiced concerns that the requirement to use only recycled HFCs for initial fill, by overriding current market forces, would have a similar effect of instigating a spike in emissions due to collapse of market confidence in HFCs. In such a market, the commenter maintained, where used HFC stocks are of low or negative value, owners and

service entities could be negatively incentivized to release stocks of HFCs to the atmosphere in anticipation of further regulations or to avoid storing a valueless commodity. The commenter also stated that with the termination of production of a potential fire suppression agent (*i.e.,* FK–5–1–12) from a manufacturer, there may likely be insufficient supply of a low-GWP alternative for HFCs, causing uncertainty about the long-term viability of fire suppression technologies. The commenter further stated that, as with the EU in 2000, they expected a rise in HFC emissions from the fire suppression sector if the requirement to use recycled HFCs for initial fill is promulgated. The commenter stated that the proposed rule, along with potential supply issues, would severely restrict market access to effective fire suppressants, further eroding customer confidence in clean agent protection and putting additional critical facilities and people at risk from a fire event.

Response: EPA disagrees with the commenter's assessment of the requirement for recycled HFCs in the fire suppression sector as disruptive or that it would be misinterpreted as regulating HFCs out of existence. The AIM Act directs EPA to implement an 85 percent phasedown of the production and consumption of HFCs from baseline by 2036. This is a phasedown and not a phaseout. The Agency foresees continued production and consumption of HFCs beyond 2036, albeit limited so as to not exceed the very restrictive cap. While this final rule has the effect of restricting the use of virgin HFCs for particular practices, processes, and activities related to servicing, repair, and installation of particular equipment, those requirements do not apply to all applications in which HFCs are used, and they do not limit the use of recycled or reclaimed HFCs that meet the regulatory criteria. In fact, as discussed throughout this final rule, the Agency expects that virgin production and consumption consistent with 40 CFR part 84, subpart A will continue and anticipates continued use of both virgin and reclaimed or recycled HFCs. Consistent with subsection (h), in developing this rule, the Agency explored options that would serve the purposes identified in subsection (h)(1), including minimizing emissions of HFCs from equipment and maximizing reclamation where appropriate. The Agency considers fire suppression, with its long and successful history of using recycled HFCs, an appropriate application for this requirement. As the phasedown continues, the availability of virgin HFCs decreases while the market demand for recycled HFCs increases in the fire suppression sector; however, EPA anticipates there will be continued demand for and use of virgin HFCs for other applications for many years. Unlike halons, most of the HFCs used in fire suppression have other uses (*e.g.,* HFC–227ea is used as a propellant for metered dose inhalers). Halons generally have only been used for fire suppression. Contrary to the comment, recent updates to the EU regulation 2024/590 puts a high value on existing supply of halons by prohibiting the destruction of halons unless the purity of the recovered or recycled substance does not allow for reclamation and reuse.[128] As market demand increases for recycled HFCs in the fire suppression sector, the value of the recycled HFCs should also increase and lead to more incentive to recover and recycle HFCs rather than releasing them. One commenter noted that the termination of a potential fire suppression agent (*i.e.,* FK–5–1–12) production from a manufacturer would mean an insufficient supply of a low-GWP alternative for HFCs, causing uncertainty about the long-term viability of fire suppression technologies. EPA recognizes the loss of an alternative agent may limit one option, but with the limited use of FK–5–1–12 to date, the termination of this agent should not cause much disruption to the market as the search for suitable alternatives would continue in those applications. It is unclear that the end of production of one agent with current limited use would cause uncertainty with fire suppression technologies in general. One commenter stated that recycled HFCs support many service requirements, providing a viable and responsible life cycle process and market-driven balance. EPA views the requirements for recycled HFCs in fire suppression equipment as a bolster to this effort.

Comment: EPA received comments requesting the export of fire suppression systems containing virgin HFCs. One commenter interpreted the phrase ''that is installed in the United States'' in 40 CFR 84.110(c), to say that the requirement to use recycled HFCs for initial fill of fire suppression equipment does not pertain to equipment intended for export. The commenter stated that fire suppression equipment intended for export could continue to be installed with virgin HFCs and that the expended allowances would continue to be refunded under the RACA process. The commenter asked for confirmation on the interpretation in the final rule.

Another commenter asserted that with the implementation of the AIM Act, the volume of HFCs placed in new fire systems in the United States has dramatically decreased. The commenter experienced more than 90 percent reduction in volume of HFCs in new systems, far exceeding the intent and goals of the AIM Act. The commenter further stated that the AIM Act has motivated fire system manufacturers to promote non-HFCs alternatives and initiate approvals for recycled HFC use in new fire systems. The commenter stated that there is no reasonable requirement for EPA to overreach its authority and require the use of recycled HFCs in the fire market, and that the market is responding and progressing in an accelerated manner without prescriptive forces. The commenter further stated if EPA believes it has the authority under the AIM Act and there is a need and benefit to requiring the use of recycled HFCs for fire suppression equipment, both new systems and service, in the United States, the export of fire systems containing virgin HFCs should continue to be allowed and qualify for the RACA process. The commenter stated that requiring U.S. fire system manufacturers to use only recycled agents for all global requirements would place them at a significant competitive disadvantage and appreciably reduce the available inventories of domestic recycled HFC fire extinguishing agents.

Response: In response to this comment, EPA first notes that it views the requirement in this final rule for recycled HFCs for fire suppression equipment to align with the purpose of minimizing the release of HFCs from that equipment under subsection (h) and to be consistent with its authority under that provision, as discussed in detail elsewhere in this section.[129] EPA notes that with certain limited

[128] Regulation (EU) 2024/590 of the European Parliament and of the Council of 7 February 2024 on substances that deplete the ozone layer, and repealing Regulation (EC) No 1005/2009. Available at *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202400590.*

[129] The comment is not clear whether it intends to suggest that the commenter views these provisions as an overreach of EPA's authority or rather is simply stating that there would be no need to overreach EPA's authority in this context (without expressing any opinion as to whether the proposed provisions did so), the commenter fails to provide any reasoning or analysis that would support an argument that these provisions exceed EPA's authority and does not provide any explanation for why it disagrees with the discussion of authority for these provisions that EPA provided in the proposal. Accordingly, even if the comment does intend to challenge EPA's authority for the fire suppression provisions, those points are addressed by EPA's discussion of its authority elsewhere in this section and no further response is needed.

exceptions discussed in section IV.F, fire suppression equipment installed in the United States will be required to meet the requirements the Agency is finalizing in this action. The comments regarding RACA are beyond the scope of this action and thus require no further response because EPA has proposed no changes to the RACA requirements of process. However, for purposes of providing information to regulated entities, EPA notes that whether fire suppression equipment may qualify for the RACA process depends on whether the equipment meets the definition of bulk in 40 CFR 84.3, which EPA is not reopening or revisiting through this rulemaking. For the purposes of 40 CFR part 84, subpart A, system cylinders, such as those used in total flooding systems are bulk substances and may be eligible for the RACA process. A portable fire extinguisher, in contrast, is not considered a bulk regulated substance because it contains a dispensing apparatus and may be used without transferring the contained regulated substance to another container. These portable fire extinguishers are products and are not eligible for the RACA process. Furthermore, RACAs are not limited to virgin HFCs—additional consumption allowances may be requested in general for verified exports of any bulk regulated substance.

EPA proposed a compliance date of January 1, 2025, for the initial installation of fire suppression equipment with recycled HFCs, and also considered other potential compliance dates. In this final rule, the Agency sets a compliance date of January 1, 2030, for the initial installation of fire suppression equipment with recycled HFCs.

Comment: One commenter stated that the compliance date of January 1, 2025, is feasible given the sector's overall comparatively small volumes of material, as well as existing infrastructure and practices regarding the use of reclaimed material, which already makes up a significant percentage of overall volumes. A few commenters expressed concern regarding the January 1, 2025, start date for the requirement for the use of recycled HFCs for the initial installation of fire suppression equipment.

One commenter stated that the time to implement the recycle requirement proposal is not sufficient for industry to adjust. The commenter stated that the proposed rule will likely leave stranded virgin HFCs already in the U.S. inventory, given the few alternative applications of fire suppression HFCs have for use in other market segments, and claimed that the timeframe would damage responsible manufacturers and shake industry confidence in clean agent fire protection technologies. The commenter stated that the short enaction timeframe would create significant delays, contract disputes, and costly modifications for projects currently in process, since new fire system requirements are mostly for newly constructed facilities, fire systems are often the last item to be installed before occupancy, and construction agreements are executed in advance of the delivery of the specified fire system, with many subcontractor agreements. The commenter mentioned that this too will further destabilize and reduce confidence in the overall fire system industry and stall the current market driven shift to recycled HFCs and alternative protection options. Additionally, the commenter maintained that the fire suppression industry operates under existing long-term contracts that require commitments of certain volumes using specific agents and asserted that the rule as proposed will cause problems and irreparable financial harm to business and users with these contractual obligations. The commenter stated that an alternative to the initial fill rule proposed, which is a ban on the import of virgin HFCs for use in domestic fire protection (except for the critical end-uses) after a certain future date, could be considered. The commenter stated that this may help avoid the irreparable financial harm to entities that have, since September 23, 2021, acted in good faith under the framework rule. The commenter expressed concerns that the passage of the rule, with the recycled HFC initial fill requirement as proposed, will not reduce HFC emissions or improve the environmental impact of HFC fire systems to sufficiently offset the increased risk to property and people.

The same commenter claimed that EPA's 2025 enaction timeframe limits the ability to revise and adjust these agreements and would create confusion among entities who have entered into agreements in good faith under the AIM Act framework schedules and structures. The commenter stated that if EPA were to enact this requirement, they would recommend a start date of January 1, 2036, or after the AIM Act phasedown to 15 percent of baseline is complete, in order to allow equipment manufacturers to fulfill or modify existing contracts, and for potential low-GWP alternatives to be introduced in an orderly manner, supportive of the market balance the commenter maintains is necessary for a viable, long-term, recycled HFC market. The commenter stated that if EPA believes enactment of this rule is required, an in-force date, no sooner than a 2030 through 2036 timeframe, must be considered to provide sufficient time to effectively prepare for such a ruling.

Another commenter requested that EPA extend the date of implementation to January 1, 2027, to allow proper time for fire suppression equipment manufacturers to assess any safety concerns or unexpected impacts of transitioning to recycled substances and development of the reclaimed HFC supply.

Another commenter stated that since the final rule will not be published until sometime in 2024, the industry would have less than a year to transition to using recycled HFCs for all first fills. The commenter stated that if EPA decides to maintain this requirement in the final rule, a start date of January 1, 2030, would be more appropriate. The commenter stated that this would provide time for equipment manufacturers to fulfill or modify existing contracts that specify newly produced agent and find alternative avenues of supply.

One commenter stated that the proposal provides a short window to perform the transition and, in their view, the most logical year would be to start the transition in 2029 when the next stepdown happens. The commenter stated that the fire suppression industry is project-based and often, projects are worked in phases over many years.

One commenter stated that the proposal does not provide sufficient time for the commercial aviation sector to safely comply with the proposed fire suppression system requirements at ground facilities such as hangars. The commenter requested that EPA extend the applicable compliance deadlines for using recycled HFCs in fire suppression systems.

Response: EPA acknowledges these comments both in support of and raising concerns with the timing of the requirements for recycled HFCs including sufficient availability of recycled HFCs for the initial installation of fire suppression equipment. EPA acknowledges the importance of the overall HFC phasedown and notes that comments on the phasedown's structure, including a ban on the import of virgin HFCs for use in fire suppression and use of consumption allowances to import virgin HFCs, are beyond the scope of this action and require no further response. The Agency does not agree that the provisions as

proposed will result in irreparable financial harm, given the adjustment made in this final rule to extend the compliance date. As noted previously, reliance on recovered and reusable HFCs will be increasingly important. Informed by comments and after further evaluation, EPA is finalizing the compliance date for the initial installation of fire suppression equipment with recycled HFCs of January 1, 2030, five years later than proposed and after the next phasedown in 2029. This will provide any companies using virgin HFCs for this purpose more time to transition to recycled HFCs. It will also allow industry time to adjust any relevant existing contracts concerning supply of recycled HFCs and provide more time to alleviate concern about inadequate supply of recycled HFCs.

Comment: A couple of commenters also mentioned that potential cross contamination continues to be an issue for recycled halon and that the requirements in 40 CFR 84.110(c)(1) and (2) should support the avoidance of this issue for HFCs in the fire suppression sector. One of the commenters commended EPA for the requirements intended to prevent cross-contamination of recycled fire suppression agents during transfer, recovery, and storage, stating that the cross-contamination of recycled halon 1301 is an ongoing problem, and that these requirements would enhance ongoing industry efforts and keep it from becoming a significant issue for HFCs.

Response: EPA acknowledges the comments that the requirements in 40 CFR 84.110(c)(1) and (2) should help to address potential cross-contamination issues with HFCs used for fire suppression.

Comment: One commenter stated that EPA's proffered options for the use of recycled HFCs for initial fill still come with difficult challenges: how far out to extend the requirement to ensure sufficient available recycled material, and how to report and manage a variable percent recycled content requirement. The commenter stated that existing AIM Act structure already presents a challenge to the use of virgin HFCs in fire suppression due to their high-GWP allowance opportunity cost. The commenter stated that this intent of the AIM Act is motivating industry towards low/no GWP options where available, promoting the general use of recycled material when possible, but leaving the flexibility of new, virgin material for those applications requiring the performance and safety of an HFC fire suppression agent when low/no GWP options are suitable and recycled HFCs may be unavailable. The commenter suggested that this is the right way to manage the limited use of HFCs in fire suppression without putting critical facilities and people at risk of a fire.

Response: As described in the proposal, EPA sought comments from stakeholders on options that would be viable. The commenter does not cite any provision in the AIM Act to support its assertion that the Act's intent is to leave general flexibility to use new virgin material for fire suppression applications nor does it cite any information or data to support the implication that there are situations when performance and safety requirements would indicate use of an HFC fire suppressant but no low/no GWP options are suitable and recycled HFCs are unavailable. Thus, EPA cannot provide a more detailed response to these concerns. As explained in detail elsewhere in section IV.F.2.b of this preamble, the provisions finalized in this rule, including the requirements to use recycled HFCs in fire suppression equipment are consistent with EPA's interpretation of its authority under subsection (h) of the AIM Act and the direction in the statutory provision. Further, elsewhere in section IV.F.2.b of this preamble, EPA has made adjustments to the requirements in the final rule based on points raised in public comments by delaying the compliance dates to address possible concerns with the supply of recycle HFCs. To the extent this comment concerns aspects of the AIM Act or EPA's implementing regulations beyond the proposed rule under subsection (h)—such as the allowances, the structure of the phasedown, and tradeable allowances—it is outside the scope of this rulemaking. EPA has a long and successful history of working with the fire suppression industry to lead in the production phaseout of halons and transition to safe alternatives through testing and changes to industry standards. This has taken into consideration the needs and challenges in sectors such as the military, oil and gas, maritime, and aviation to protect critical facilities, equipment, and personnel. We look forward to managing the ER&R program in the same way.

c. Requirements for Servicing and/or Repair of Existing Equipment for Fire Suppression

EPA is requiring the servicing and/or repair of fire suppression equipment to be done with recycled HFCs, including both total flooding systems and streaming applications, starting on January 1, 2026. Covered entities are required to evacuate, as applicable, all equipment used to recover, store, and/or transfer HFCs prior to each use to prevent contamination, arrange for destruction of the recovered HFCs as necessary (*e.g.,* recovered HFCs that are too contaminated to be recycled), and collect and dispose of wastes from recycling process. If the recycling of HFCs is not practical, the disposal of HFCs will help to prevent releases of used HFCs into the atmosphere.

In 2015, data on recycling of HFC fire suppression agents were collected as part of the HEEP, which is a voluntary data collection effort implemented by the fire suppression industry. HEEP collects data on sales of fire suppression agents for recharge in order to estimate annual emissions of HFCs. These data showed that the HFC–227ea, HFC–125, HFC–236fa and HFC–23 were all recycled for fire suppression use.[130] In recent years, approximately 75 percent of HFCs sold for recharge came from recyclers, with 80 percent reported in 2020, based on data submitted voluntarily to HEEP, which may not include all entities in this sector.[131]

As part of servicing and/or repairing fire suppression equipment, recovery and recycling equipment is used to recover HFCs. EPA is also requiring that covered entities must (1) operate and maintain recovery and recycling equipment in accordance with manufacturer specifications to ensure that the equipment performs as specified; (2) repair leaks in HFC storage, recovery, recycling, or charging equipment before use; and (3) ensure that cross-contamination does not occur through the mixing of HFCs that may be contained in similar cylinders. Recovery equipment collects HFCs from equipment, and recycling equipment, which is used during servicing and/or repair, removes contaminants from HFCs. By ensuring that this equipment is functioning properly, HFC releases can be minimized during the recovery and recycling process. The requirements finalized in this rule will ensure that releases from fire suppression equipment are minimized when recycling HFCs during servicing and/or repairing fire suppression equipment.

Comment: One commenter stated that there is no need to require the fire suppression industry to migrate to a

[130] HARC comments on Notice of Data Availability Relevant to Management of Regulated Substances under the American Innovation and Manufacturing Act of 2020 are available in the docket (EPA–HQ–OAR–2022–0606) for this rulemaking at *https://www.regulations.gov.*

[131] HARC Report of the HFC Emissions Estimating Program (HEEP) 2002–2020 Data Collection, October 2022.

recycled agent for servicing existing systems. The commenter stated that most important, protected assets require quick servicing, often within 24 hours, in order to maintain their critical functions. The commenter stated that sometimes, to maintain critical function in a timely manner, newly made HFCs are more expedient. The commenter stated that the high value risk and critical function requirements of many protected facilities supports the continued availability of both options, virgin and recycled, to best manage risk for these facilities.

Another commenter mentioned that the AIM Act has already effectively reduced the use of HFCs in new fire suppression systems beyond the statutory requirements of the Act, reinforcing the use of recycled HFCs for servicing existing systems. This comment is also covered in section IV.F.2.b of this final rule.

As mentioned in section IV.F.2.b of this final rule, one commenter expressed support for EPA's proposal to increase the use of reclaimed and recycled HFCs in new and existing HFC-containing fire suppression equipment. Another commenter also expressed support for the proposal to require the use of recycled HFCs to service existing fire suppression equipment. The commenter stated that as the HEEP data show, recycled HFCs already provide the vast majority of agent used for servicing in the United States. The commenter suggested that the requirement to use recycled HFCs for servicing should begin on January 1, 2028, in order to provide adequate time for any companies still using virgin HFCs for service to make the transition.

Response: As the HEEP data show, recycled HFCs are already extensively being used for servicing. EPA understands this to be already industry practice used by most entities. EPA also appreciates the need for flexibility in supporting critical function of fire suppression equipment and in particular for high value equipment. Therefore, EPA is finalizing a later compliance date than proposed for the use recycled HFCs in the service and/or repair of fire suppression equipment (*i.e.,* January 1, 2026) to provide industry time to adjust to the changes, make any necessary infrastructure changes, and make any necessary changes to existing business contracts. This delay of the compliance date will enable the fire suppression industry to build up additional stock of recycled HFCs to meet demand for servicing and/or repair of fire suppression equipment. While one commenter suggested a compliance date of 2028 for servicing, EPA concludes that an earlier compliance date than 2028 is reasonable for these requirements, given the use of recycled HFCs is already common practice in the fire suppression industry for this application.

Comment: As covered in section IV.F.2.b of this final rule, one commenter mentioned that the final rule should preserve the ability to use substitutes for initial installation and servicing/repair of fire suppression equipment.

Response: As covered in section IV.F.2.b of this final rule, EPA acknowledges the comment. As responded to in section IV.F.2.b of this final rule, nothing in this final rule impedes the use of fire suppression alternatives.

d. Fire Suppression Technician Training

Starting as of January 1, 2026, EPA is requiring that all entities that employ fire suppression technicians who maintain, service, repair, install, or dispose of fire suppression equipment containing HFCs must provide training (as described in this section) and ensure that their fire suppression technicians complete this training. Fire suppression technicians must be trained by June 1, 2026. Fire suppression technicians hired after January 1, 2026, must be similarly trained within 30 days of hiring, or by June 1, 2026, whichever is later. EPA considers this a one-time training requirement. This requirement is intended to control practices, processes, or activities regarding servicing, repair, disposal, or installation of such fire suppression equipment by providing fire suppression technicians with knowledge and skills to minimize releases of HFCs during such practices, processes, or activities, and the requirements involve a regulated substance. Fire suppression technicians are an important part in any effort to control unnecessary HFC emissions from fire suppression equipment while servicing, repairing, installing, or disposing of such equipment. By training fire suppression technicians in the significance of minimizing unnecessary HFC releases from fire suppression equipment and providing information on applicable procedures such as the recovery and recycling or reclamation of HFCs from the fire suppression equipment, technician training supports EPA's effort to reduce HFC emissions from fire suppression equipment.

The HFC fire suppression technician training must be designed to include: (1) An explanation of the purpose of the training requirement, including the significance of minimizing releases of HFCs and ensuring technician safety; (2) an overview of HFCs and environmental concerns with HFCs including discussion of other Federal, State, local, or Tribal fire, building, safety, and environmental codes and standards; (3) a review of relevant regulations concerning HFCs,[132] including the requirements of this section that apply with respect to fire suppression equipment; and (4) specific technical instruction relevant to avoiding unnecessary HFC emissions during the servicing, repair, disposal, or installation of fire suppression equipment.

Comment: A few commenters expressed their support for EPA's proposed training requirement for fire suppression technicians. One of the commenters expressed support for the proposed training requirements for this sector to ensure higher rates of recovery and recycling of HFCs. The commenter stated that the proposed training requirements will be highly valuable to the fire suppression sector which has technicians skilled in the recovery and recycling of HFCs. Another commenter supported enhanced training for fire suppression technicians to facilitate the implementation of the fire protection requirements.

One commenter requested that EPA develop course content of the required training and make it available to the regulated community. The commenter stated that this would ensure consistent course content across the country and be far more cost-effective then having every regulated facility generate training for the technicians that service their regulated fire suppression systems.

Response: EPA acknowledges commenters' support of the training requirement for fire suppression technicians and is finalizing this requirement as proposed with only a change to the compliance date to January 1, 2026, to align with other changes such as the compliance date for the servicing and/repair of fire suppression equipment to be done with recycled HFCs. The Agency acknowledges the request for consistent course content across the country; however, the Agency considers the affected entities able to design effective training on their own taking into consideration their needs and practices, as relevant. That said, on a voluntary basis, EPA could review and provide

[132] These may include, but are not limited to, other EPA regulations, DOT regulations, Occupational Safety and Health Administration (OSHA) regulations, codes and standards of NFPA, and other federal, state, or local fire, building, safety, and environmental codes and standards.

feedback on training programs and materials. The Agency has provided a list of the primary topics to be included in the training: (1) An explanation of the purpose of the training requirement, including the significance of minimizing releases of HFCs and ensuring fire suppression technician safety; (2) an overview of HFCs and environmental concerns with HFCs; (3) a review of relevant regulations concerning HFCs, including the requirements of the HFC emissions reduction program for fire suppression equipment; and (4) specific technical instruction relevant to avoiding unnecessary HFC emissions during the servicing, repair, disposal, or installation of fire suppression equipment at each individual facility. EPA may provide suggested resources to assist entities to develop the training as necessary.

e. Recycling of HFCs Prior to Disposal of Fire Suppression Equipment Containing HFCs

EPA proposed requirements related to the disposal of fire suppression equipment. The intent of these requirements is to ensure that HFCs have been recovered and recycled from the equipment prior to the final step of the disposal of the equipment so that HFCs are not released during the disposal of the equipment. EPA is requiring owners and operators of fire suppression equipment containing HFCs (including an HFC blend) to dispose of this equipment by recovering the HFCs themselves or by arranging for HFC recovery by a fire suppression equipment manufacturer or distributor, or a fire suppressant recycler. EPA is also requiring that owners and operators dispose of HFCs used as a fire suppression agent by sending them for recycling to a fire suppressant recycler or a reclaimer certified under 40 CFR 82.164 or by arranging for its destruction using one of the controlled processes listed in 40 CFR 84.29. Consistent with 40 CFR part 82, subpart H, disposal of HFCs used as a fire suppression agent means the process leading to and including discarding of HFC-containing equipment. The voluntary industry standards that apply to the uses of HFCs in fire suppression equipment, NFPA 2001 for fire suppression systems and NFPA 10 for fire extinguishers, contain no current requirement for the recovery and disposal of HFCs prior to disposal of equipment. Efforts by the industry to minimize emissions of HFCs used in the fire suppression sector have to date been on a voluntary basis. For example, the VCOP includes as part of its emission reduction strategies during storage, handling, and transfer of HFCs, requirements to recover the agents after the end of the equipment's useful life and either recycle or destroy them. These requirements will minimize emissions of HFCs through recovery of the agent prior to disposal of the equipment and ensure that recycling or proper disposal of HFCs occurs broadly within this sector of use. Under the requirements, the owners and operators of this equipment (*e.g.,* specialized fire suppression systems containing HFCs that protect high value equipment, such as electronic server rooms or oil and gas production facilities) must ensure that HFCs are recovered from the fire suppression equipment before it is sent for disposal, either by recovering the HFCs themselves before sending the equipment for disposal or by leaving the HFCs in the equipment and sending it for disposal to a facility (*e.g.,* fire suppression equipment manufacturer, a distributor, or a fire suppressant recycler) operating in accordance with industry standards (*i.e.,* NFPA 10 and NFPA 2001 standards), as applicable. The owners or operators of fire suppression equipment also must recover any HFCs, as part of the disposal of such equipment, by sending them to a fire suppressant recycler operating in accordance with the relevant industry standards, which EPA understands to be the NFPA 10 and NFPA 2001 standards (depending on the type of equipment), by sending them to a reclaimer certified under 40 CFR 82.164, or by arranging for their destruction by a technology that is listed as an approved technology for destruction of the relevant regulated substance in the regulations at 40 CFR 84.29. As part of implementing subsection (h)(1) of the AIM Act, these requirements control practices, processes, or activities regarding the disposal of such fire suppression equipment by establishing certain requirements that must be met as part of the disposal process and involve a regulated substance.

Owners and operators of fire suppression equipment who recover HFCs prior to disposal may already be aware of the importance of HFC recycling given prior communication efforts by the industry and may already take steps to ensure recovery of HFCs prior to disposal. The recycling of HFCs plays an important role in providing the fire suppression sector with continued supply of HFCs for fire suppression equipment during servicing. Industry trade organizations have encouraged owners and operators of fire suppression equipment and those disposing of HFCs to contact fire suppression equipment manufacturers, distributors, or fire suppressant recyclers to ensure that HFCs are safely recovered from equipment and recycled for future use. Therefore, the requirements finalized in this rule are likely consistent with current industry practices. Most fire suppression systems and extinguishers in use today are purchased, installed, and serviced by fire suppression equipment distributors. EPA is aware that there are established distribution channels within the commercial and industrial sectors where these specialized systems are used. Industry representatives have also indicated that the simplest way in their opinion to ensure proper recycling of HFCs is to encourage equipment owners to return equipment containing HFCs to distributors.[133] EPA values using established industry practices where such practices exist and can be used to meet the Agency's intended goals.

Comment: One commenter expressed support for the requirements in sections 84.110(e) and 84.110(f) on the disposal of fire suppression equipment and the disposal of HFCs used in fire suppression. Another commenter also supported the proper disposal of HFC fire suppression equipment and agents.

Response: EPA acknowledges the commenters' support for the requirement to recycle HFCs prior to disposal of fire suppression equipment containing HFCs and is finalizing as proposed requirements to recover and recycle HFCs prior to the final step of disposal of the fire suppression equipment.

f. Recordkeeping and Reporting

EPA is finalizing recordkeeping and reporting requirements on the fire suppression provisions under subsection (h) for HFCs used in the installation of new equipment and servicing and/or repair of existing equipment. EPA is finalizing these recordkeeping and reporting requirements mainly as proposed with some modifications to the requested information to clarify the intent of the regulatory text. As part of implementing subsection (h)(1) of the AIM Act, these provisions control practices, processes, or activities regarding servicing, repair, disposal, or installation of fire suppression equipment, and involve a regulated substance. For example, the

[133] HARC comments, dated November 7, 2022, to Notice of Data Availability Relevant to Management of Regulated Substances Under the American Innovation and Manufacturing Act of 2020 are available in the docket (EPA–HQ–OAR–2022–0606) for this rulemaking at *https://www.regulations.gov.*

requirements control recordkeeping and reporting practices, process, or activities for servicing and repair that involves HFCs.

EPA is requiring covered entities in the fire suppression sector to provide data on HFCs to the Agency. The fire suppression industry is familiar with data collection and reporting, as some of the entities in this industry are voluntarily reporting data to HEEP as mentioned in section IV.F.2.b of this preamble. Relevant reporting entities covered under this requirement include entities that perform first fill of equipment, service (*e.g.,* recharge) equipment and/or recycle regulated substances. Relevant entities include companies, such as equipment manufacturers, distributors, agent suppliers, or installers that recycle regulated substances. Records related to the fire suppression sector must be maintained for three years. Specifically, the covered entities must submit a report to the Agency annually covering the prior year's activity from January 1 through December 31. The first annual report must be submitted to the Agency on February 14, 2027, and subsequent annual reports must be submitted by February 14 of each subsequent year. Each annual report must be submitted electronically, using the Agency's applicable reporting platform. Each annual report must contain basic identification information (*i.e.,* owner name, facility name, facility address where equipment is located) and the following information for each regulated substance:

- The quantity of material (the combined mass of regulated substance and contaminants) sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment;
- The quantity of material (the combined mass of regulated substance and contaminants) in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin;
- The total sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment;
- The total mass in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin; and
- The total mass of waste products the reporting entity sent for disposal, along with information about the disposal facility if waste is not processed by the reporting entity.

Covered entities must maintain an electronic or paper copy of the fire suppression technician training as discussed in section IV.F.2.d, and EPA can request to view a copy of the training on an as needed basis. EPA is also requiring facilities to document that they have provided training to personnel. For example, local personnel records could be annotated, indicating where and when the training occurred. Alternatively, records could be centralized. Where EPA established requirements for recordkeeping, the Agency is requiring that the records be maintained for three years in either electronic or paper format.

As discussed in section IV.F.2.e, EPA is requiring that covered entities maintain records documenting that HFCs are recovered from the fire suppression equipment before the equipment is sent for disposal, either by recovering the HFCs themselves before sending the equipment for disposal or by leaving the HFCs in the equipment and sending it for disposal to a facility (*e.g.,* fire suppression equipment manufacturer, distributor, or a fire suppressant recycler). Such records must be maintained for three years.

The recordkeeping and reporting requirements in this action do not change any recordkeeping and reporting requirements for fire suppressant recycling per 40 CFR 84.31(j) (Subpart A) and EPA is not reopening or revisiting those requirements through this action. If any entity is reporting information to EPA under Subpart A that is also required under the reporting provisions established in this final rule at 84.110(g), EPA will consider the information reported under Subpart A in evaluating whether the corresponding reporting obligations under this final rule have been satisfied. There is one instance where there is overlap between 40 CFR 84.31(j) and in this final rule at 84.110(g). Under 40 CFR 84.31(j), each recycler of a regulated substance used as a fire suppressant must submit a report containing the quantity of each regulated substance held in inventory onsite broken out by recovered, recycled, and virgin. To the extent the information reported by an entity under Subpart A overlaps with the information that must be reported under provisions established in this final rule at 84.110(g), in lieu of reporting the same information twice, in completing the reporting under 84.110(g) the entity may refer to the corresponding information reported under Subpart A and explain how it satisfies the reporting requirements under 84.110(g).

Comment: A couple of commenters expressed concerns about the requirements for reporting and recordkeeping being onerous and unnecessary. The commenters stated that the current requirements under the Allocation Program provide sufficient information for EPA to track the amount of HFCs being used and recycled for fire suppression. The commenters also claimed that the domestic movement of halons or HCFCs used for fire suppression have had no history of illegal activity, while the high GWPs of fire suppression agents make it unlikely that fire suppression equipment would be used to illegally move HFCs. The commenters also claimed that existing reporting, recordkeeping, and testing requirements under 40 CFR 84.31(j) have been challenging for the industry, to a degree that companies in the sector who previously performed HFC recycling in-house no longer perform that service to avoid EPA reporting requirements. The commenters also stated that if the proposed reporting and recordkeeping requirements take effect, companies may choose to not to install or service HFC-based equipment, which they claimed would work against the stated goal of the AIM Act framework rule to stimulate HFC recycling and could lead to increased HFC emissions. Additionally, the commenters stated that the management of halons in the United States over the last several decades has demonstrated a model of collaboration between industry, government, and users, which the commenters maintained has been accomplished with the necessary reporting requirements on manufacture, import, and export. One of the commenters claimed that the degree of reporting and recordkeeping requirements in the existing requirements and the proposed action makes the regulation burdensome, while bringing no environmental benefit. The commenter claimed this burden would further disrupt the market balance currently allowing for environmentally responsible, circular economy, commercial options. The commenter stated that increasing the burden of recordkeeping and reporting beyond what is currently proven successful would provide no value to EPA or industry, and would add what they characterized as unnecessary complexity to an already challenging situation. The other commenter questioned why EPA needs a report of every HFC-based fire protection system or extinguisher that is sold or serviced in the United States.

Response: EPA acknowledges the time and resources that reporters dedicate to fulfilling reporting requirements. EPA considers these recordkeeping and reporting requirements to be a reasonable approach to assessing compliance with requirements under subsection (h) to help ensure the rules serve their intended purposes of minimizing releases of HFCs from fire suppression equipment. Additionally, the fire suppression industry is familiar with data collection and reporting under HEEP, which helps industry minimize emissions by setting benchmarks, among other things. HEEP supports successful implementation of the elements of the VCOP. EPA acknowledges that the fire suppression industry has been voluntarily reporting under HEEP, however because this reporting is voluntary and managed by a third party, EPA could not reasonably be expected to have complete information in order to accurately assess compliance by individual companies subject to this rule. EPA is not asking for information for every individual piece of equipment, but instead on the quantities of HFCs sold, the quantities in inventory onsite including virgin, recovered, and recycled HFCs, and virgin as well as quantities sent for disposal. This information is similar to information already reported by certain members of the industry on a voluntary basis to HEEP. The recordkeeping and reporting requirements will support compliance and improve the overall understanding of the availability of recycled HFCs used in the fire suppression sector. This information may provide data that is helpful in implementing the regulations and assessing compliance. This information may also help to inform future rulemakings under the AIM Act. Consistent with EPA's approach under other AIM Act programs, EPA intends to share data publicly. Additionally, these requirements are limited to entities that perform first fill of equipment, service (*e.g.,* recharge) equipment and/or recycle regulated substances. Relevant entities include companies, such as equipment manufacturers, distributors, agent suppliers, or installers that recycle regulated substances. These covered entities are in the same categories as those that provide information on a voluntary basis to HEEP (*i.e.,* in 2020, 16 companies reported to HEEP). As a result, the Agency disagrees with the commenters' assertion that recordkeeping and reporting would bring no environmental benefit. Under 40 CFR part 84, subpart A, information is collected for the purposes related to the Allocation Program and requested from fire suppression recyclers only. EPA is requesting information from covered entities under this provision to account for the management of HFCs and to minimize releases in the fire suppression sector. EPA intends to limit to the extent practicable duplicative burden between part 84 subparts A and C by using the same reporting systems. If there are any duplicative requirements, entities would only report once. As noted in section II.B of this preamble, recordkeeping and reporting under the AIM Act are also supported by section 114 of the CAA, which applies to the AIM Act and rules promulgated under it as provided in subsection (k)(1)(C) of the AIM Act.

Comment: Another commenter stated that fire suppression systems can accidently be triggered to release the regulated substance (*e.g.,* electronic failure) and are not situations of intentional release or releases due to failure to maintain the system. The commenter suggested that EPA require, under 40 CFR 84.110(g), that the owner/operator maintain documentation for three years from the date of release of any accidental releases of a regulated substance from a fire suppression system that was not a result of failure to maintain the system. The commenter also requested that EPA specify the address or location where to send the report requested in 84.110(g).

Response: EPA acknowledges the suggestion for including the date of release of any accidental releases of a regulated substance from a fire suppression system that was not a result of failure to maintain the system. EPA understands that accidental releases in these fire suppression systems are relatively rare, and any releases are typically addressed quickly due to the nature of the specialty equipment these fire suppression systems are protecting. For these reasons, EPA is not finalizing such a requirement because the Agency does not plan to use this information at this time.

Reports requested in 84.110(g) must be submitted electronically using the Agency's applicable reporting platform.

G. What requirements is EPA establishing for handling disposable cylinders?

1. Requirements for Disposable Cylinders

EPA proposed to require that disposable cylinders containing HFCs and that have been used for the servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment must be sent to an EPA-certified reclaimer or a fire suppressant recycler. EPA also proposed that these entities (*i.e.,* reclaimers and fire suppressant recyclers) must remove all HFCs, including any remaining amount after the cylinders are considered empty for servicing, repair, and installation purposes (*e.g.,* the heel), prior to discarding these cylinders. The Agency proposed a compliance date of January 1, 2025, for requiring that disposable cylinders be sent to a reclaimer or fire suppressant recycler and for the removal of HFCs from disposable cylinders. EPA also proposed that the remaining heel in containers that have been used in the servicing, repair, or installation of equipment would not be considered a virgin regulated substance. Additionally, EPA requested comment on an alternative approach that would involve requiring the final processor of a disposable cylinder to ensure that all regulated substances, including the remaining heel, have been recovered prior to final disposition of the cylinder; or a combination of the lead proposal and this alternate approach. Related to the alternative approach, EPA discussed the consideration of recordkeeping requirements that would be necessary for the alternative approach and requested comments on other relevant factors such as the level of vacuum needed to ensure proper evacuation of the heel and information on recovery machines available to perform the heel removal. EPA also requested comment broadly on the current channels by which disposable cylinders are transported to have the heels removed.

EPA is finalizing aspects of the proposal, with modifications, after consideration of the comments and information received on the proposed rule. First, EPA is requiring that disposable cylinders that contain HFCs and that have been used for the servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment must be sent to a reclaimer, fire suppressant recycler, final processor, or refrigerant supplier for removal of the heel. EPA is also requiring that the removed heel must be sent to an EPA-certified reclaimer for further processing. In the case where disposable cylinders contain a heel of an HFC refrigerant that has flammability characteristics (*i.e.,* class 2 or class 2L), EPA is finalizing that final processors or wholesalers/distributors may remove these heels that would be considered ignitable spent refrigerant under 40 CFR part 266, subpart Q, as long as the recovered ignitable spent refrigerant is sent to an EPA-certified reclaimer

meeting the RCRA alternate standards, as described in section IV.H. The Agency is also delaying the proposed compliance date from January 1, 2025, to January 1, 2028, to allow additional time for implementation (as described in subsequent responses to comments).

Finally, the Agency is establishing an alternate approach informed by comments received on the proposed rule for appropriate levels of evacuation of the heel from disposable cylinders. As discussed in response to comments in this section, EPA received comments suggesting an evacuation level of 15 inches of mercury (in-Hg) for disposable cylinders. After consideration of the comments, EPA is establishing an alternate compliance method where a certified technician evacuates a disposable cylinder to a level of 15 in-Hg (relative to a standard atmospheric pressure of 29.9 in-Hg), certifies that they have done so, and provides a certification statement accompanying the evacuated disposable cylinder to the final processor. If these criteria are met, a certified technician may discard the cylinder to a final processor, and the cylinder would not need further processing or be sent to a reclaimer or fire suppressant recycler.[134] In establishing this alternate compliance method, the Agency does not intend for final processors to accept certification statements from a certified technician if the final processor knows or has reason to know that a certification statement contains falsified information (*e.g.,* if there are clear indications that the heels within a disposable cylinder have not been evacuated properly, such as punctures in the cylinder that would suggest improper venting of the cylinder's heel), it would be inconsistent with the intent of this provision for the final processor to accept those cylinders and the accompanying certification. The certification statement must be signed by the certified technician who removed the heel and accompany each disposable cylinder discarded in this way. If all the disposable cylinders in a shipment were evacuated by the same technician, the technician may provide a single certification that covers each of the cylinders in the shipment. The certification must include the statement and information as provided in 40 CFR 84.116(e). EPA is also finalizing that a final processor who receives a disposable cylinder being discarded in this way must maintain a record of the signed certification statement for three years.

Comment: Many commenters generally supported the proposed requirements to have disposable cylinders sent to certified reclaimers or fire suppressant recyclers for removal of the remaining heel. Some commenters stated that the requirements would support the goals of subsection (h) aimed at minimizing releases and maximizing reclamation. Many other commenters opposed the proposed requirements with a few commenters requesting that EPA eliminate the requirements from the final rule altogether.

Response: EPA acknowledges the comments in support of these provisions and responds that the Agency is finalizing these requirements with additional flexibilities and a later compliance date to ensure effective and efficient implementation. EPA agrees that these requirements are important for meeting the purposes identified in subsection (h) of the AIM Act and promote increased opportunities for reclamation. As discussed in the proposed rule, heels from used disposable cylinders provide an important source of material that can bolster the amount of refrigerant that can be reclaimed. HFC releases of heels are far more likely to occur from disposable cylinders than from other types of cylinders, and those amounts of HFCs released are not available for reclamation. Comments in opposition of the requirements that were proposed are discussed in more detail in this section.

Comment: Some commenters questioned EPA's authority to require that used disposable cylinders be sent to reclaimers or fire suppressant recyclers. One commenter stated that the proposed provision was outside the scope of the authority of subsection (h). The commenter opposed EPA's interpretation of ''any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment . . .'' to cover practices, processes, and activities that may occur before or after the servicing, repair, disposal, or installation of equipment, stating that the interpretation took a limited grant of authority in subsection (h) to an unlimited grant of authority over the entire HVACR supply chain. The commenter stated that the provisions for shipping disposable cylinders containing heels is beyond the authority granted in subsection (h)(1), even it can increase refrigerant reclamation. Another commenter stated that the requirement for used disposable cylinders to be sent only to reclaimers or fire suppressant recyclers was arbitrary and capricious and not adequately justified and that EPA did not properly consider others in the supply chain that could remove the heel from disposable cylinders. Another commenter stated that the authority under subsection (h) does, in fact, allow EPA to establish this provision, as it aligns with the statutory language in subsection (h).

Response: EPA agrees with the commenter's conclusion that this provision aligns with EPA's authority under subsection (h) and disagrees with the comment asserting that EPA is interpreting an unlimited grant of authority of the HVACR supply chain under subsection (h). As described above in this notice and in the proposal, subsection (h) of the AIM Act directs EPA to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves regulated substances, among other things, for purposes of maximizing reclaiming and minimizing the release of a regulated substance from equipment and ensuring the safety of technicians and consumers. EPA interprets this authority to include the comprehensive practice, process, or activity regarding the servicing, repair, disposal, or installation, including aspects that may occur before or after the servicing, repair, disposal, or installation of the equipment. This interpretation is supported by both the text of the provision and the statutory context in which it appears. With respect to the text, Congress authorized EPA to regulate ''any practice, process, or activity *regarding* the servicing, repair, disposal, or installation of equipment'' (emphasis added). The term ''regarding'' is broad and indicates that Congress intended for EPA's authority to encompass not only the actions or events directly involved in the servicing, repair, disposal, or installation of equipment, but also practices, processes, or activities that relate to or concern the servicing, repair, disposal, or installation of equipment. This could include practices, processes, or activities that occur before or after the servicing, repair, disposal, or installation. Similarly, by authorizing regulations to control ''any practice, process, or activity,'' Congress conveyed EPA authority to control actions or

[134] EPA clarifies that under 40 CFR 261.7(b)(2), a container that has held a hazardous waste that is a compressed gas is empty when the pressure in the container approaches atmospheric. Where a disposable cylinder that contained a refrigerant with mild flammability characteristics (*e.g.,* class 2 or 2L) is being discarded using the alternate compliance method, evacuating to a vacuum of 15-in Hg would also meet the requirements for an ''empty container'' under 40 CFR 261.7(b)(2), since the vacuum of 15 in-Hg would be an evacuation level beyond atmospheric pressure.

situations that occur throughout, or at any point, during the relevant practice, process, or activity. This interpretation is also consistent with ensuring that the regulations can fully serve the purposes identified in subsection (h)(1) (''maximizing'' reclamation, ''minimizing'' release, and ''ensuring'' safety), as EPA may need to regulate actions or situations that occur before or after the servicing, repair, disposal, or installation to achieve these purposes. EPA acknowledges the statutory language to promulgate regulations ''as appropriate'' to control such practices, processes, and activities. Based on EPA's interpretation of this provision, subsection (h)(1) authorizes the Agency to develop regulations that include provisions for the handling of HFCs in a disposable cylinder when the cylinder and a portion of the HFCs contained therein were used in the servicing, repair, disposal, or installation of equipment. The use of HFCs in these cylinders is a typical practice during servicing, repair, or installation of equipment and the associated disposal of the cylinder, and typically some HFCs remain in the cylinder after such use, unless steps have been taken to remove them from the cylinder. Accordingly, the disposition of the HFCs remaining in the cylinder is inherent to the use of HFCs in such cylinders in the servicing, repair, disposal, or installation of equipment. Thus, the Agency considers these requirements as establishing appropriate controls for a practice, process, or activity as related to the servicing, repair, or installation of equipment.

Comment: A number of commenters questioned the amount of HFC refrigerant that remains in the heel of disposable cylinders. Some commenters provided information on the amount left in the heels of disposable cylinders based on experience and data. Commenters provided various estimates, including (percentages based on a nominal 30-pound disposable cylinder): 0.1 pounds (~0.33%), 0.3 pounds (1%), 0.5 pounds (~1.67%), 1.25 pounds (~4.16%), and 1.5 pounds (5%). One commenter cited various other estimates including 1.85 percent from CARB, noting this was also corroborated by Heating, Air-conditioning and Refrigeration Distributors International (HARDI), and 0.2 percent to 4.4 percent from Chemours, an HFC producer. The commenter also cited National Refrigerants, a reclaimer, stating that 90 percent of cylinders have a remaining heel of 0.5 pounds (about two percent by weight) or less and that 60 percent have no discernible heel. One commenter provided sample data from UL testing of an SAE J2788 AC Service Machine, noting the net remaining heel was around 50 grams (~0.1 pounds), and was typical of heels in disposable cylinders used in the MVAC industry. Another commenter stated that around two-thirds of used cylinders are completely empty. Other commenters stated that the remaining heel in disposable cylinders is minimal as contractors and technicians have a strong incentive to use as much refrigerant from disposable cylinders as possible. Another commenter provided data on remaining refrigerant in small cans of automotive refrigerant per CARB's regulations, with a remaining amount of 4 percent.

One commenter stated that there were inconsistencies in the draft RIA and supporting draft Cylinder Analysis TSD.[135] Further, the commenter stated EPA did not clearly and consistently identify heel estimates used when assessing potential benefits of the cylinder management requirements. The commenter stated that the proposed rule preamble was not clear in how the heel estimate of 1.25 pounds was concluded, while relevant analyses assumed a heel of 0.96 pounds. The commenter stated that EPA referenced personal communications for the heel estimates but did not make clear the sources of the information or provide them or supporting documentation in the docket for the rulemaking and that other relevant studies are available and could have been used to provide information on concluding an accurate heel estimate. Such studies were provided to EPA in previous comments to the Allocation Framework Rule. The commenter provided studies and related data that they stated could be used to estimate the heel in a disposable cylinder. The commenter also stated that EPA's assumption that 95 percent of all cylinders are vented is an extraordinary assumption, though 95 percent may be feasible if it is based on the number of cylinders that are not returned to companies after they are sold. The commenter continued to state that there is currently no nationally applicable cylinder take-back program, and licensed professionals who use the cylinders would not be expected to return them but, rather, dispose of them properly without illegal venting, such as through recovery of heel with a vacuum pump in the field; in-house refrigerant recovery or recycling; or sending non-refillable cylinders to a reclamation facility. The commenter noted previously available information on rates of cylinder venting.

Response: EPA acknowledges these comments and understands that the estimate of a typical heel in a disposable cylinder may vary. Given the wide variety of estimates from commenters on the amount of heel in a typical disposable cylinder, EPA maintains its central estimate that a typical heel is 4 percent by weight of the cylinder. We have updated the Refrigerant Cylinders: Analysis of Use, Disposal, and Distribution of Refrigerants TSD to more clearly and consistently show this assumption as well as a low and high estimate. In the Economic Impact and Benefits TSD, the Agency also provides a sensitivity analysis using a value of 1.2 percent, as provided by a commenter, which EPA understands to be a possible estimate for the remaining heel in a cylinder. The amount (mass) of an HFC held in a full disposable cylinder varies by HFC, and hence the amount of the heel would vary. Although typical full sizes include 30 pounds (*e.g.,* HFC–134a) and 25 pounds (*e.g.,* R–410A), to be conservative EPA used 24 pounds (*e.g.,* R–404A) as the cylinder size, thus leading to a heel of 0.96 pounds or 0.288 pounds in the sensitivity analysis. As one commenter pointed out, at proposal, EPA had estimated higher heel amounts; this was due to the higher estimates of the charge size of cylinders and has been updated in the Economic Impact and Benefits TSD. EPA further notes that the information on which it was relying for the analyses for the proposed rule was reflected in the draft Cylinder Analysis TSD, which was included in the docket for this rulemaking. As noted, EPA has updated the draft TSD and includes revisions to clarify the source of information that is presented in the TSD and used for relevant calculations. Thus, the relevant information that was considered in developing the proposed rule was available in the docket at the time of proposal. Likewise, the information and data on which the final rule is based is also included in the docket.

In addition to the above sensitivity analysis, EPA performed analyses assuming a much higher number of disposable cylinders, assuming full recovery of a large share of such cylinders, and a combination of all three assumptions. EPA refers to the

[135] EPA further notes that this comment stated that it was incorporating the OMB Pass-Back records in EPA–HQ–OAR–2022–0606–0028 with the stated goal of ensuring that these records would be included within the administrative record for any subsequent judicial review of this rulemaking. EPA responds that section 307(d)(7)(A) of the CAA is clear that the record for judicial review does not contain interagency review materials as described in CAA 307(d)(4)(B)(ii).

Economic Impact and Benefits TSD for additional details and results.

EPA responds to the commenter regarding the venting rate of refrigerant heels in disposable cylinders. EPA is not using the assumption that 95 percent of heels are vented as a basis for its analysis in either the preamble, the Economic Impact and Benefits TSD, or in any other supporting documents. In the Economic Impact and Benefits TSD, EPA provided a cost and emissions reduction analysis for disposable cylinder heels with two venting scenarios: a scenario in which 10 percent of cylinder heels are vented, and a control analysis in which 100 percent of refrigerant heels are vented. See Table K–5 of the TSD. Readers may estimate approximate costs and benefits at different venting scenarios by linearly interpolating between the results of the two scenarios conducted. EPA acknowledges that there are other publicly available estimates of refrigerant venting, including CARB's estimate that 70 percent of disposable cylinders are recycled or disposed of without heel evacuation.

Comment: One commenter expressed concern with the Agency's draft RIA addendum and conclusions regarding sufficiency of the infrastructure necessitated by the proposed new cylinder management and tracking requirements, as well as the time and costs associated with its implementation and broad application across multiple industry sectors; requiring thousands of businesses, including many small businesses, to comply with extensive new obligations on extremely short timelines. The commenter stated that EPA must use relevant data to develop a reasonable estimate of the number of refrigerant cylinders that these thousands of newly regulated entities will be required to manage and track, stating that the assumption that ''4.5 million HFC cylinders will be sold in the United States in 2025'' represents a substantial underestimation that is not based on, and in fact fails to consider, relevant and credible data in the Agency's possession, including comments on the proposed 2021 NRC Ban and confidential sales data provided to the Agency, as well as data from the United States International Trade Commission. The commenter further stated that the Agency's 4.5 million cylinder estimate only represents the number of 30-pound refrigerant cylinders used annually in the United States, and this estimate does not include 15-pound cylinders, 50-pound cylinders, or any other bulk refrigerant containers that would be subject to the proposed rule's cylinder management and tracking requirements, noting that without a reasonable estimate of the universe of refrigerant cylinders potentially impacted, EPA cannot assess small business impacts as required by the Regulatory Flexibility Act (RFA) or the cost of the proposed rule's recordkeeping and reporting requirements under the Paperwork Reduction Act (PRA). The commenter urged EPA reevaluate its conclusions in light of the data provided to the Agency throughout the course of multiple cylinder-related rulemakings and to reconsider the cylinder management. The commenter stated that proposed requirements do not appear to be based on a complete and legally sufficient analysis of the best available data, and that EPA may have overstated the environmental benefits of the proposed cylinder management.

Response: EPA acknowledges this comment and reads it as referring to the proposed requirements for container tracking as well as the requirement to remove heels from disposable cylinders. In response to the former, EPA is not finalizing cylinder tracking requirements in this rule. In response to comments on managing the removal of heels from disposable cylinders, please see the response above related to additional considerations and estimates in the Economic Impact and Benefit TSD.

EPA also responds that the requirements for removing the heels from disposable cylinders before they are discarded are being modified from the proposal, based on comments received on the proposal and further considerations. EPA is finalizing additional flexibilities, including allowing the heels of disposable cylinders to be removed at different points in the reverse supply chain (*e.g.,* by a final processor or a wholesaler/distributor). Further, EPA is delaying the compliance date for these requirements from January 1, 2025, to January 1, 2028, to allow for additional time for industry to become familiar with the regulations and secure necessary connections within the reverse supply chain. EPA is also establishing an alternative approach to allow disposable cylinders that are evacuated to a specified level of vacuum to be discarded with an accompanying certification. EPA provides additional details on these requirements in responses throughout this section. Overall, these modifications provide additional flexibilities as compared to the proposed requirements while also helping to achieve the purposes identified in subsection (h) of the AIM Act.

With respect to the number of cylinders that the requirement to remove heels covers, EPA notes that it has used data from the commenter to perform a sensitivity analysis. See the Economic Impact and Benefits TSD for additional details.

Comment: EPA received some comments related to the data collection and tracking of transporting disposable cylinders and the associate heel recovery. Some commenters were opposed and stated that the proposed tracking and data collection requirements were burdensome. Another commenter expressed concerns that the effectiveness of compliance with the requirements to remove heels from disposable cylinders would be lacking absent adequate tracking provisions. Another commenter expressed support for tracking the cylinders until they reach a reclaimer or fire suppressant recycler.

Response: EPA acknowledges these comments. The Agency is not finalizing, as part of this rulemaking under the AIM Act, the proposed provisions for container tracking of HFCs that could be used in the servicing, repair, and/or installation of refrigerant-containing or fire suppression equipment. However, as discussed in this section, the Agency is finalizing provisions to ensure that used disposable cylinders are properly handled and the removed heels are sent to reclaimers. EPA is including flexibilities, as discussed throughout this section, for the removal of the heel from used disposable cylinders. EPA understands that these flexibilities are, in some cases, consistent with current practices for the management of used disposable cylinders to remove the heel, such that entities in the reverse supply chain are capable of removing the heel and consolidating to a recovery cylinder to send to reclaimers. EPA is also requiring that heels removed from used disposable cylinders must be sent to reclaimers, where the used disposable cylinder is not already being directly sent to a reclaimer. Further, the Agency is establishing an alternate approach allowing certified technicians to certify that a disposable cylinder has been evacuated to a specified level of vacuum and the cylinder can be discarded with no further processing.

Comment: Multiple commenters voiced concerns regarding the ability and capacity of reclaimers to process the influx of many disposable cylinders and remove heels. One commenter requested that EPA consider allowing reclaimers to use a batch method of removing the heels from disposable cylinders and report as a net amount, rather than per cylinder. A couple of commenters noted

that reclaimers may not be prepared and have the capacity to handle the volume of incoming disposable cylinders and that the compliance timeline is inadequate. The commenters stated the need for additional storage space for the cylinders and potential investments in transfer, recovery, and crushing and disposal equipment. Some commenters further stated that the associated costs of these types of equipment may ultimately be passed down in the form of charging to accept disposable cylinders. Another commenter stated that the Agency confounded the distinct actions of removal and reclamation, and this requirement to be responsible for removal and reclaiming the material would be burdensome on reclaimers.

One commenter further expressed uncertainty as to whether EPA-certified refrigerant reclaimers have adequate capacity to manage the volume of HFCs that would be required to be reclaimed or whether that capacity can sufficiently increase within the proposed compliance deadline. The commenter cited that the Agency's solicitation of comments on whether to allow recovery by parties other than certified reclaimers suggests its concern that the current 63 EPA-certified refrigerant reclaimers may not be able to manage timely HFC recovery from 4.5 million estimated cylinders. The commenter further stated that the actual domestic refrigerant cylinder market of nearly twice this size will surely create a massive refrigerant recovery bottleneck that will cascade throughout the refrigeration and HVACR supply chain and could undermine the purpose and intent of the proposed rule.

Response: EPA acknowledges the comments related to logistical concerns with handling the influx of disposable cylinders with the proposed requirements. In response to comments stating concerns about reclaimers having capacity, storage space, and other resources to process the influx of disposable cylinders, the Agency notes it is finalizing modifications to the provisions for handling of used disposable cylinders. As explained in this section, EPA is finalizing flexibilities to these requirements that would achieve the goals of subsection (h) of the AIM Act. These flexibilities would also help alleviate the number of disposable cylinders that would be sent directly to a reclaimer to have the heel removed and processed. Among these provisions, EPA is finalizing that used disposable cylinders can be sent to a final processor or back through the reverse supply chain to have the heels removed and consolidated. EPA recognizes these current channels in the reverse supply chain or the waste distribution chain that make for effective processing of used disposable cylinders and removal of heels for ultimate reclamation or, for fire suppressants, recycling. EPA anticipates that this would reduce the number of individual, used disposable cylinders that a reclaimer receives for heel removal and processing. Further, the Agency is establishing a compliance date of January 1, 2028, as compared to January 1, 2025, in the proposed rule to allow the industry to prepare effectively.

EPA acknowledges there is a value in disposable cylinders and estimates those benefits in the Economic Impact and Benefits TSD. This analysis includes estimated costs for transportation, assumed by truck, as compared to business-as-usual practices. Whether a wholesaler chooses to inventory disposable cylinders that are returned, remove the heels and consolidate them, or expeditiously send them to locations allowed under the final rule, is a business decision; therefore, any value lost due to occupying inventory space is not assessed as doing so is not a requirement in this final rule and EPA does not have information on how to place a value or cost estimate on such inventory space.

In response to the comment about processing removed heels in a batch method as compared to the single cylinder level, EPA views this comment as related to the proposed container tracking requirements. As explained in section I.B, the Agency, at this time, is not taking final action on container tracking requirements, and this rulemaking does not establish reporting requirements for the amount of heels removed by reclaimers at the single cylinder level. Additionally, reclaimers who receive disposable cylinders and remove the heels are not required to record data for each single cylinder received. Reclaimers will continue to report their totals of refrigerant received or reclaimed when reporting under the CAA section 608 programs (40 CFR part 82, subpart F) and the HFC Allocation Program (40 CFR part 84, subpart A).

EPA acknowledges comments related to current reclaimer capacity and meeting supply of reclaimed refrigerants as required to support provisions in this rulemaking. EPA addresses comments related to reclaimed refrigerant supply in section IV.E.2 of this rulemaking. Regarding comments related to uncertainty of reclaimers to process the influx of a volume of HFCs being sourced from heels of disposable cylinders, EPA responds that comments to the proposed rule describe that reclaimers have the capacity to process the volume of HFCs. EPA is aware of reclaimers expanding capacity volume-wise and increasing capacity of advanced separation technologies to effectively process additional material. EPA notes that comments related to uncertainty of reclaimers' capacity received in this rulemaking were related to processing the influx of disposable cylinders and removing heels. The additional flexibilities being finalized related to the handling of used disposable cylinders help to address these concerns (as discussed in responses in this section).

Comment: EPA received multiple comments related to the distribution chains that would support the movement of disposable cylinders to reclaimers. Some commenters stated that the distribution chains for returning recovered materials, as EPA alluded to in the proposed rule, may have difficulty accommodating the increase in magnitude of disposable cylinders per the proposed requirements, since these distribution chains are typically used more for return of recovery cylinders. Other commenters noted that the existing distribution chains could be used to support the movement of disposable cylinders per the proposed requirements. One commenter stated that in current practices, contractors may already be consolidating recovered material into a recovery cylinder (including heels) before taking them to a distributor. Another commenter stated that there are multiple avenues for refrigerant recovery from cylinders, such as current practices to send disposable cylinders to reclaimers or wholesale distribution-operated cylinder recycling programs, and allowing contractors to recover the remaining refrigerant and be compensated for sending the recovered refrigerant to a certified reclaimer. The commenter noted that while programs for returning disposable cylinders to reclaimers exist, this method for recovery of the heel may be inefficient and rely on proximity to a reclaimer.

EPA received many comments on alternate approaches that shared features with the alternate approaches described in the proposed rule, one of which would allow final processors (*e.g.,* landfill operators, scrap metal recyclers) to be the entity to recover heels from disposable cylinders prior to discarding, and another of which would have allowed more than just reclaimers to recover the heel, while still requiring that all the removed material be sent to reclaimers for further processing. Many commenters were supportive of aspects of the alternate approach in

combination with the proposed requirements. One commenter stated that EPA should consider alternatives to send near-empty disposable cylinders to a local appliance disposal outlet in addition to sending directly to a reclaimer. Another commenter supported the implementation of similar regulations to those for small appliance disposal under CAA section 608, such that a final processor is responsible for ensuring the remaining refrigerant is removed from a cylinder either by them or prior to them receiving the cylinder. Another commenter stated they supported alternative approaches to allowing others in the supply chain to remove heels from disposable cylinders provided the entities have associated reporting requirements for total amounts recovered annually. The commenter further noted that the benefits of the alternate approach could help address any increase in transportation emissions or costs related to shipping disposable cylinders. One commenter stated that the alternate approach matches practices that are already occurring effectively where disposable cylinders are collected by recycling companies, distributors, and appliance recyclers. The commenter further stated that there may be cases where entities send disposable cylinders that contained a unique refrigerant to reclaimers ''as is'' rather than recovering and mixing refrigerants in a common recovery cylinder. Another commenter stated that another consideration could be for the cylinders to be sent back to the refrigerant company for proper disposal or recycling.

One commenter stated that the alternate approach may also provide benefits for supermarkets, which may not have direct relationships with reclaimers, but rather rely on third-party service providers. The commenter noted the importance of using the existing channels to send disposable cylinders to distributers or suppliers to then be sent to a final processor or reclaimer.

Some commenters discussed other approaches to be considered for the recovery of heels from disposable cylinders. One commenter supported provisions to recover heels from disposable cylinders in general, but stated that certified technicians should be trained and able to recover heels from disposable cylinders before disposal of the cylinders. The commenter noted the efficiency and reduced transportation burden associated with allowing certified technicians or others (*e.g.,* distributors) to remove and aggregate heels to a recovery cylinder for shipping, rather than shipping many individual disposable cylinders. The commenter stated that EPA should at least conduct a lifecycle analysis of net GHG emissions in various scenarios to understand their environmental impacts. Other commenters stated that EPA could allow any certified technician to recover heels prior to disposal of the cylinder. One commenter also suggested considering associated recordkeeping that could be subject to auditing. The commenter described an approach that would involve contractors and technicians recovering the heels from disposable cylinders prior to disposal and includes suggestions for establishing programs for cylinder returns to wholesalers or distributers. The commenter stated that the approach described could be made less burdensome by extending the program to contractors and disposable cylinder users, in addition to certified technicians, and coordinating with wholesalers, reclaimers, and/or refrigerant suppliers.

One commenter was opposed to the approach to allow a final processor to recover the heel from disposable cylinders, noting this practice could lead to venting remaining heels by metal recyclers or waste disposal facilities. Another commenter, while not opposing the alternate approach, stated it is advantageous to have the disposable cylinders sent to reclaimers, enabling them to promptly remove and reclaim the heel and allowing EPA to gauge success through required reporting.

One commenter stated that establishing collection points, especially in areas with few EPA-certified reclaimers, could help mitigate concerns with costs and logistics, though there may still be some associated costs. Another commenter stated that requiring disposable cylinders to be sent to EPA-certified reclaimers or fire suppressant recyclers would compete for truck space with shipping recovery cylinders that are full of recovered material. Another commenter stated that the logistics and costs of being able to first aggregate heels from disposable cylinders into a larger recovery cylinder would be more efficient, and transporting one larger recovery cylinder would greatly reduce transport of many disposable cylinders.

Response: EPA acknowledges that the current reverse supply chain and waste distribution channels are varied. Many distribution channels for reclaimers are generally more limited to the processing of recovery cylinders to reclaimers, though not exclusively. EPA is also aware that many of these same channels are also currently being used for the transport of disposable cylinders with a remaining heel. As commenters noted, the current channels are effective, as many contractors or technicians may rely on sending used disposable cylinders to a wholesaler or distributer that consolidates and then sends them for further processing to a reclaimer. EPA is finalizing that disposable cylinders with a heel may continue to be sent through these channels with their intermediate steps to ultimately reach a reclaimer, such as through distributors or wholesalers. EPA recognizes that these current practices can be effective and allowing their continued use for processing of used disposable cylinders provides flexibilities to manage the volume of disposable cylinders being transported for recovery of the heel. The Agency notes that it may be appropriate for the distributor or wholesaler to be the entity that recovers and consolidates the heels from disposable cylinders, recognizing the improved logistics of consolidating heels to a single recovery cylinder. Where this practice may be occurring, EPA anticipates that the distributor or wholesaler has demonstrated the capability to remove all of the heel from the disposable cylinder prior to discarding. EPA expects this is reasonable, as commenters have stated this is a common practice that is currently occurring for the processing of a used disposable cylinder. Further, EPA anticipates that distributors or wholesalers that are performing this practice recognize the value in the removed heel that can be sent to a reclaimer.

In this action, EPA is adopting portions of the alternative approach; specifically, EPA is finalizing an option for used disposable cylinders to be sent to final processors (*e.g.,* landfill operators, scrap metal recyclers, etc.) for removal of the heel. As noted earlier in this response, EPA is also finalizing that the reverse supply chain may be utilized for the transport of used disposable cylinders to have the heel removed (*e.g.,* sent to a distributor or wholesaler capable of removing the heel). EPA is establishing requirements that heels removed by final processors or distributors/wholesalers must be sent to a reclaimer or fire suppressant recycler. The added flexibilities should allow those with used disposable cylinders to have additional options for the proper handling of such cylinders. In general, the Agency anticipates that the added flexibility will provide access to discard used disposable cylinders at locations in closer proximity to contractors and

technicians, reducing transportation [136] costs and emissions associated with disposing the used cylinders. Final processors may already be receiving small appliances (*e.g.,* less than five pounds of refrigerant) and consistent with the regulations promulgated under CAA section 608, may already be recovering these refrigerants per those requirements and sending them for reclamation per those requirements. Further, where used disposable cylinders have been sent for processing by a final processor or a distributor or wholesaler, the removed heels would be consolidated into a common recovery cylinder. As commenters stated, this practice could help to improve logistics related to truck space for shipping materials to a reclaimer or fire suppressant recycler for further processing. Therefore, EPA is finalizing these flexibilities for sending the disposable cylinders to the reclaimers, which are intended to result in the proper removal of the heel and to ensure that the HFCs from removed heels are sent to reclaimers or fire suppressant recyclers for further processing and reuse.

EPA acknowledges other comments that suggest that a certified technician be allowed to remove the heel from disposable cylinders. As described more fully in a response later in this section, EPA is finalizing an alternate approach where certified technicians may certify that a heel has been removed from a disposable cylinder to a vacuum level of 15 in-Hg, relative to standard atmospheric pressure of 29.9 in-Hg. In this case, a used disposable cylinder certified to have been evacuated to a vacuum level of 15 in-Hg may be discarded to a final processor without further processing. This alternate approach being finalized by the Agency helps to ensure the contents of disposable cylinders are effectively used and the remaining heel is negligible before the cylinder is discarded.

EPA acknowledges the comments suggesting establishment of collection points for used disposable cylinders to promote further organization for the recovery of heels. The Agency agrees that collection points could be an effective avenue for facilitating the return of disposable cylinders to entities capable of properly removing the heel and disposing of them. EPA is aware of reclaimers that offer services such as collection sites for returning recovered refrigerant, which may include returning used disposable cylinders. The Agency sees these collection facilities and practices as appropriate avenues for discarding cylinders and proper heel removal, so long as they are in compliance with all regulatory requirements, including those being established in this rulemaking.

Finally, EPA is establishing a compliance date of January 1, 2028, which is three years later than the proposed compliance date. The later compliance date will allow additional time for the distribution networks to be established and allow industry to set up necessary contracts and logistics for the transport of used disposable cylinders and the recovery of the remaining heels.

Comment: Many commenters expressed concerns regarding the logistics related to the proposed requirements and consideration of the net benefits (costs and GHGs emissions avoided) when comparing the potential costs and emissions related to transporting the disposable cylinders to reclaimers or fire suppressant recyclers. Some commenters stated that the transportation of the disposable cylinders would incur costs and require complex logistics. The commenters stated that the contractors or technicians using the disposable cylinders may not be located near an EPA-certified reclaimer or a fire suppressant recycler and would be required to travel further than they normally do to dispose of a used cylinder. Further, the commenters stated that the logistics of transporting and handling the used disposable cylinders would require additional labor and coordinating with reclaimers or fire suppressant recyclers within their operating hours. One commenter noted that labor shortages are present in the industry and there may be a challenge in these requirements competing with other revenue-generating activities. Another commenter stated that shipping disposable cylinders to reclaimers is inefficient and noted that others in the supply chain are also capable of removing the heel properly per AHRI Guideline Q. Other commenters stated that the emissions associated with transporting disposable cylinders for heel recovery may exceed those avoided by recovering the heel, and the associated costs may outweigh the value of the recovered refrigerant. Further, other commenters stated that associated costs for collecting disposable cylinders could end up getting passed on to contractors or technicians and then further passed on to customers. Additional commenters expressed concerns about wholesalers' storage space for used disposable cylinders that they would accept to then be sent to a reclaimer.

Response: EPA acknowledges these comments on the logistics of this provision and responds that the Agency is finalizing modifications that would allow for additional flexibilities for proper handling of used disposable cylinders. The final rule allows for additional avenues for the transport of used disposable cylinders and the removal of the heel; for example, as described in this section, sending used disposable cylinders to a final processor or through the reverse supply chain (*e.g.,* distributors or wholesalers) for the removal of the heel to be sent to a reclaimer or fire suppressant recycler. EPA acknowledges the importance of the reverse supply chain and waste distribution chains and the capability of distributors and wholesalers to remove heels or otherwise facilitate the transport of the disposable cylinders to a reclaimer, fire suppressant recycler, or final processor for proper heel recovery and cylinder disposal. These additional avenues provide flexibility and improved logistics for returning disposable cylinders. The Economic Impact and Benefits TSD accompanying this rulemaking provides additional detail on costs and considerations of logistics described in these comments. While comments noted that a person may have limited access to returning a disposable cylinder to a reclaimer or fire suppressant recycler as proposed, it is likely that person would have access to a distributor, wholesaler, or final processor where they can transport the disposable cylinder. Further, this additional accessibility includes the consideration of proximity and other logistics, such as cutting down on the overall number of disposable cylinders that would be in transit. These considerations would reduce the overall transportation distance needed to bring these disposable cylinders to proper disposal and the number of trips, by allowing the consolidation of heels by other entities in the distribution chain. Thus, overall emissions associated with transportation of the disposable cylinders would be reduced. Further, EPA is aware that some reclaimers operate collection sites or offer services to pick up recovered refrigerant, which could be an additional avenue that provides a closer cylinder return option for returning disposable cylinders to reclaimers.

Allowing the use of the typical avenues for processing disposable cylinders (*e.g.,* through distributors or wholesalers) and the inclusion of the alternate approach to allow final processors to recover heels and dispose

[136] EPA addressed transportation related costs in the draft Economic Impact and Benefits TSD and further addresses such costs in the Economic Impact and Benefits TSD accompanying this final rule.

cylinders would also alleviate concerns related to labor and coordination with reclaimers to accept cylinders. These flexibilities would make use of existing avenues to transport and process disposable cylinders and remove heels as they are sent along to reclaimers or fire suppressant recyclers for further reprocessing. EPA recognizes that factors such as available labor will be a consideration for covered entities as they decide among the expanded available compliance options on removal of heels and proper discarding of disposable cylinders. EPA is aware that reclaimers often buy back recovered refrigerant, and the Agency expects that this practice would also be relevant to returned disposable cylinders with remaining heels or with heels that have been recovered and consolidated from disposable cylinders. Others may choose to send cylinders to final disposal entities. Reclaimers may choose to expand the use of collection points or work with distributors. The final rule provides additional flexibility while still increasing the removal of heels from disposable cylinders for further reclamation.

Related to storage of flammable refrigerants at wholesaler facilities, as discussed in section IV.H, EPA is finalizing requirements that allow final processors or those in the reverse supply chain (*e.g.,* distributors or wholesalers) to manage ignitable spent refrigerant removed from disposable cylinders under the finalized RCRA alternative standards, which include emergency preparedness and response requirements to address the risk of fire from the storage of flammable refrigerants. As part of compliance with the RCRA alternative standards, final processors or those in the reverse supply chain (*e.g.,* distributors or wholesalers) that remove heels of ignitable spent refrigerants are required to send the materials to an EPA-certified reclaimer that is in compliance with the RCRA alternative standards. The criteria of the RCRA alternative standards are such that handling of these used cylinders is done so properly and safely.

Comment: One commenter recommended the Agency withdraw the proposed requirements for disposable cylinders and consider re-proposing in a separate action.

Response: EPA responds that the Agency is finalizing these requirements with a later compliance date and increased flexibility for achieving the outcome. The Agency notes that recovering the heels from disposable cylinders is an important opportunity to help achieve the guiding goals of subsection (h) to minimize releases and maximize reclaim. The heels in disposable cylinders provide an important source of recovered refrigerant that will be necessary to help support the supply of reclaimed HFCs as the phasedown progresses and the required uses of reclaimed HFCs per this rulemaking become effective.

Comment: EPA received multiple comments about the proposed compliance dates for these requirements. Some commenters stated that the proposed compliance date of January 1, 2025, would be difficult to meet. One commenter stated that the compliance date should be no earlier than January 1, 2028, due to supply chain constraints and new processes and equipment needed in the supply chain. Another commenter stated that contracts that are already in place would need to be revised or established per this provision, but could not be done so until the regulation is final. Setting up these contracts would take longer than the anticipated time between the regulation being finalized and the proposed compliance date of January 1, 2025. The commenter suggested that the compliance date be 18 months from the final regulation being published in the **Federal Register**. Another commenter stated that these provisions should not be in effect until reclaimers are able to sufficiently secure the resources (*e.g.,* recovery equipment, storage/warehouse space) and logistics (*e.g.,* agreements with scrap metal recyclers to accept the empty disposable cylinders) needed for implementation. The commenter stated that this is not practical in terms of the proposed compliance date.

Response: EPA acknowledges these comments and considerations. Consistent with commenters' suggestions, the Agency is finalizing a later compliance date. The Agency is establishing a compliance date of January 1, 2028, with these logistical and implementation challenges in mind. The delayed compliance date should allow those affected in the transport of disposable cylinders and the reclaimers and fire suppressant recyclers that receive the cylinders to develop the infrastructure and business relationships needed to comply with the more flexible approach in the final rule.

Comment: One commenter expressed support for the Agency's proposal that the remaining heel in disposable cylinders not be treated as virgin material, noting that residual material may deviate from specifications and that recovered residual material should not be exempt from any current reclaimer reporting requirements. Another commenter stated that the remaining heel seems as though it would still be virgin refrigerant. The commenter stated that a reclaimer could recover and verify the condition of the refrigerant. Further, the commenter stated that the recovered heels could be an additional stock of virgin material available to the market.

Response: EPA acknowledges these comments and, as explained in section IV.A.2, is revising the definition of ''virgin regulated substance.'' EPA is not including an exclusion to the definition for recovered heels from containers. The Agency is, however, finalizing to not consider recovered heels towards the total virgin percentage in reclaimed HFCs, as described in section IV.E.2. As EPA understands, the removed heels from disposable cylinders may be recovered into recovery cylinders for consolidation. While best practices would dictate that the one type of HFC or HFC blend is recovered into a recovery cylinder, this may not always be the case. Removed heels may end up in a recovery cylinder containing one or more other substances. In the case reclaimers are the ones to remove the heels from used disposable cylinders, they will typically reprocess the recovered heels to ensure the recovered materials are brought to the required purity specifications for reclaimed refrigerants.

Further, the Agency notes that material recovered and reclaimed from disposable cylinders must be reported under current reclaimer reporting requirements (*i.e.,* reporting per 40 CFR part 82, subpart F and 40 CFR part 84, subpart A). Heels directly removed by reclaimers, but not yet reclaimed, are considered as material received and should be reported as such under current reporting for material received by reclaimers. Likewise, for fire suppressant recyclers, any heels directly recovered, but not yet recycled, should be reported as recovered material per the reporting requirements established in this rulemaking (see section IV.F.2.f).

Comment: One commenter stated that a ban on disposable cylinders would have been more effective for reducing releases and maximizing the reclaim of regulated substances. Another commenter stated that EPA improperly alluded to having the statutory authority to reinstate a ban on non-refillable cylinders by stating in the proposed rule that the Agency is ''not at this time proposing'' to ban non-refillable cylinders.

Response: EPA acknowledges these comments. The Agency did not propose to ban the use of disposable cylinders in this rulemaking and reiterates that it is not establishing such a ban in this final rule. The statement in the proposed rule

that EPA was ''not at this time proposing'' to establish a prohibition like the one at issue in *HARDI* v. *EPA,* 71 F.4th 59, 68 (D.C. Cir. 2023) was intended to describe the Agency action under consideration and how it differed from the prohibition in the Allocation Framework Rule. In the proposal, the Agency acknowledged that the prohibition had been vacated in the *HARDI* decision, as the court found that EPA had not cited adequate authority to support it. Further, as noted in response to a comment below, the Agency is acting consistent with the *HARDI* decision. Because the Agency did not propose and is not finalizing such a ban as part of this action, it need not address whether it would have authority to do so here. EPA notes that the provisions to require removal and reclaim of heels from disposable cylinders are effective to help mitigate the release of the remaining heel to the atmosphere while providing a source of recovered refrigerant to be available for reclamation.

Comment: One commenter suggested that the requirements for disposable cylinders be expanded to refillable cylinders as well. The commenter noted potential issues of not requiring that refillable cylinders be handled by reclaimers or have required heel recovery, which included potential venting or discarding of the refillable cylinder improperly.

Response: EPA acknowledges this comment and understands the value of ensuring removal of the refrigerant left in heels of refillable cylinders. EPA notes that the risk of venting heels and improper management after use is more common to disposable cylinders, given they are discarded and not reused. Refillable cylinders are refilled and reused, so a requirement to remove refrigerant heels is unnecessary if the cylinder is being refilled with the same refrigerant. In cases where the refillable cylinder would be filled with a different refrigerant, the remaining refrigerant would need to be properly removed to ensure the cylinder was completely emptied before refilling with a different refrigerant, which EPA understands is a standard practice to avoid mixing refrigerants in a refillable cylinder. Thus, EPA notes these requirements are more appropriate for disposable cylinders.

Comment: One commenter mentioned that the proposal was unclear about who is responsible for sending the disposable cylinder to a reclaimer and asked if it was the equipment owner/operator or a contractor.

Response: EPA is establishing requirements based on the cylinders that have been used in the servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment. Ultimately, the responsibility would likely fall on the person using or managing the disposable cylinder of refrigerant or fire suppressant. In most cases, the technician or contractor performing the process, practice, or activity related to servicing, repair, or installation is the user of the disposable cylinder. In other cases, the contractor or technician may report to the location (*e.g.,* a supermarket) that manages its own supply of refrigerant in disposable cylinders. In this case, the responsibility of sending the disposable cylinder may fall on the equipment owner/operator; however, they may arrange agreements with the contractor or technician to be the person sending the disposable cylinder. The logistics of sending the disposable cylinder may depend on the different practices that are used. In the case one of these entities has a working business relationship with a reclaimer, it would be feasible for that entity to manage sending the disposable cylinders to a reclaimer. In other cases, it may be more logistical to have the person who purchases the refrigerant be responsible for the return of the disposable cylinder if they typically are already returning disposable cylinders to their wholesaler or distributor, who would then be responsible for returning the removed heels or disposable cylinders to a reclaimer. Finally, as described above, EPA is finalizing, in conjunction, aspects of the alternate approach to allow disposable cylinders to be sent to final processors for the heel removal, and EPA is also finalizing that used disposable cylinders may be transported through the reverse supply chain (*e.g.,* a distributor or a wholesaler) for the removal of the heel. A contractor, technician, or an equipment owner/operator may wish to establish agreements with a final processor or utilize any existing business relationships they have with distributors or wholesalers to manage the disposable cylinders for heel removal and ultimately sending the removed heels to reclaimers or fire suppressant recyclers.

Comment: One commenter stated that when recovery machines are used for refrigerants, the refrigerant lubricates the machines; however, this lubrication will not occur in a machine strictly doing heel removal, and such a machine will have a shorter lifespan.

Response: EPA is aware that recovery machines are used in practice to remove refrigerant from equipment and can be used to remove heels from disposable cylinders. EPA assumes that a recovery machine will be used for each of these practices, and not strictly one or the other. Further, the Agency anticipates that recovery machines will have proper maintenance to ensure that they are running efficiently and are properly operated throughout their useful lifetime.

Comment: One commenter stated that the proposed regulatory text contained conflicting language about the ownership of recovered refrigerant, surplus refrigerant, and disposable containers with heels. The commenter states that the language should be clarified to not exclude companies important to the supply chain that purchase or accept recovered gas or salvage and recycling companies.

Response: EPA acknowledges this comment. The Agency did not intend to propose to limit so that only one avenue (*i.e.,* sending used disposable cylinders to reclaimers or fire suppressant recyclers) would be available to send disposable cylinders to reclaimers or fire suppressant recyclers. EPA is aware of and has reviewed comments on the significance of other components of the reverse supply chain (*e.g.,* distributors or wholesalers) to the transport of disposable cylinders to reclaimers and fire suppressant recyclers. The Agency also notes that it is finalizing provisions to allow the used disposable cylinders to be sent to a final processor or through the reverse supply chain for removal of the heel and ultimately sending the recovered material to a reclaimer.

Comment: Two commenters stated that the Agency should define when a cylinder is considered empty and is considered to no longer contain a regulated substance, which could reduce the need to send all disposable cylinders for heel removal. One such commenter suggested that a disposable cylinder could be considered empty when the cylinder approaches atmospheric pressure, as consistent with RCRA regulations; and that the pressure of the cylinder would be documented. Further, the commenter stated that EPA should state in the regulation how a reclaimer would determine that all remaining contents of a disposable cylinder have been removed, and if there is a specified pressure level that should be met. The other commenter stated that EPA must be clear by what is meant to remove all substances from a cylinder, noting current requirements for removing refrigerants from equipment to acceptable levels.

Other commenters suggested requiring that heels from disposable cylinders be evacuated to a level of a minimum 15 in-Hg. One commenter

stated that EPA could require records be kept for anyone evacuating a cylinder, including quantity of cylinders evacuated and disposed of by refrigerant type.

Response: EPA acknowledges this comment and understands that the industry is seeking clarity on a finite specification of the required level of heel removal from a disposable cylinder. EPA notes that there are longstanding requirements under 40 CFR part 82, subpart F, for evacuation levels of refrigerants from appliances using certified recovery machines. These requirements include evacuating to various levels of vacuum on appliances depending on the types of appliances and range from 0 to 15 in-Hg. EPA is also aware of AHRI Guideline Q on recovery and proper recycling of refrigerant cylinders.[137] AHRI Guideline Q defines an empty state for disposable cylinders as being evacuated to a vacuum of 15 in-Hg (relative to a standard atmospheric pressure of 29.9 in-Hg). EPA is not establishing a specified level of evacuation for disposable cylinders in this rulemaking. However, EPA is establishing an alternate compliance option that makes use of the evacuation level described in AHRI Guideline Q. Where a used disposable cylinder is evacuated to a level of 15 in-Hg (relative to a standard atmospheric pressure of 29.9 in-Hg), a person may discard of the cylinder, and the cylinder does not require further processing or need to be sent to a reclaimer or fire suppressant recycler, if they provide a certification statement during transport to a final processor. EPA is aware that the certified recovery machines are capable of achieving the level of vacuum of 15 in-Hg to remove the heels from disposable cylinders. Where a cylinder is not evacuated to 15 in-Hg or a certification is not provided, the requirements for sending a disposable cylinder for heel removal to a reclaimer, fire suppressant recycler, or final processor or through the reverse supply chain apply. In addition, in the case of disposable cylinders containing ignitable refrigerant, such cylinders must meet the RCRA definition of empty container [138] in 40 CFR 261.7 or be managed under the applicable RCRA standards. EPA is assessing these comments and considering a separate rulemaking as related to comments requested in the ANPRM for considerations for technicians.

Comment: While emphasizing *HARDI* v. *EPA,* one commenter expressed concern that EPA has yet to amend the CFR in accordance with the D.C. Circuit's binding vacatur, and indicated the absence of any conforming revisions to the CFR creates significant uncertainty throughout the industry.

Response: EPA responds that any action in response to *HARDI* v. *EPA* is outside the scope of this rulemaking, and thus comments related to such action require no response. For purposes of public awareness, the Agency notes that it is acting consistent with the *HARDI* decision and is not implementing or enforcing the QR code and tracking requirements for all cylinders containing HFCs found at 40 CFR 84.23. EPA has prepared a rulemaking (89 FR 73588, September 11, 2024) to remove this requirement from the CFR.

Comment: One commenter provided alternate considerations to address concerns of heel emissions from disposable cylinders. The commenter described their experience in cylinder design and adaptation for class A2L refrigerants, noting a resealable pressure relief valve and left-handed threads to avoid inadvertent connection to a refrigerant with flammability characteristics. Further, the commenter proposed equipping disposable cylinders with a resealable pressure relief valve to prevent fugitive emissions. The commenter also stated that disposable cylinders could be redesigned with a redundant pressure-tight seal to prevent venting by using a self-sealing valve that controls gas flow and could prevent venting. The self-sealing valve would be similar to that for small cans of automotive refrigerant. The commenter also suggested developing and deploying equipment for heel recovery and preparation of disposable cylinders for disposal. The commenter states that it may be possible to reduce venting of heels by making heel recovery and cylinder recovery easier and less time consuming. Beyond the cylinders, the commenter suggested other means of addressing venting heels, including the development of a disposable cylinder buyback program, which the commenter states could be more effective than the proposed requirements if left to be led by industry. The commenter also stated options such as heel recovery and recycling programs internal to companies, contractor-led programs where cylinders are evacuated to 15 in-Hg prior to disposal, or programs where refrigerant producers and packagers establish a seller take-back administered at local levels by wholesale customers. Finally, the commenter recommended that EPA consider labeling for disposable cylinders that includes a warning and disposal instructions.

Other commenters suggested that the disposable cylinders could be made of recyclable materials.

Response: The Agency appreciates the commenter's suggestions on considerations for alternative cylinder designs to minimize emissions. EPA intends to evaluate the information provided for any potential future rulemakings. While materials for the disposable cylinders are outside of the scope of this rulemaking, EPA notes that the cylinders are made of steel, which can be recycled.

Regarding alternate considerations beyond cylinder design, EPA appreciates these comments and suggestions. The Agency provided responses to similar suggestions in comment responses in this section. For example, EPA is addressing flexibilities of transporting used disposable cylinders to reclaimers and fire suppressant recyclers by including the alternate approach to allow final processors to accept disposable cylinders and recover the heel and establishing that the recovery of the heel may occur at other points in the reverse supply chain (*e.g.,* wholesalers and distributors). These entities are those that are capable of removing the heel from disposable cylinders and thus have access to the proper recovery machines. EPA also notes that while establishing collection sites may improve logistics of returning disposable cylinders for recovery of the heel, the Agency is not the appropriate entity to establish such sites under a regulatory action. Further, EPA is establishing an alternate approach considering an evacuation level of 15 in-Hg, as described earlier in this section. The Agency appreciates the suggestion to establish a labeling requirement for disposable cylinders that would describe safe and proper disposal of the cylinder. EPA is not at this time establishing such labeling requirements, but may consider such a requirement in a future rulemaking. The Agency also notes that the manufacturers of these cylinders could

[137] Air-Conditioning, Heating, and Refrigeration Institute, Guideline Q: Content Recovery & Proper Recycling of Refrigerant Cylinders, 2016. Available at: *https://www.ahrinet.org/system/files/2023-06/AHRI_Guideline_Q_2016_0.pdf.*

[138] EPA clarifies that under 40 CFR 261.7(b)(2), a container that has held a hazardous waste that is a compressed gas is empty when the pressure in the container approaches atmospheric. Where a disposable cylinder that contained a refrigerant that exhibits the hazardous characteristic of ignitability under 40 CFR 261.21 (generally expected to include all flammable refrigerants; *i.e.,* Class 2, 2l, and 3) is being discarded using the alternate compliance method, evacuating to a vacuum of 15-in Hg would also meet the requirements for an "empty container" under 40 CFR 261.7(b)(2), since the vacuum of 15 in-Hg would be an evacuation level beyond atmospheric pressure.

provide additional information on their labels if they choose to do so, as long as that information is not counter to the requirements established by this final rule.

2. Small Cans of Refrigerant

EPA did not propose that small cans [139] of refrigerant with self-sealing valves (*i.e.,* those that qualify for exemption from the sales restriction under 40 CFR 82.154(c)(ix)) must be sent to a reclaimer for disposal after use. EPA did not receive adverse comments on this proposed approach and is finalizing as proposed. EPA is accordingly not applying the modified requirements for disposable cylinders as described in section IV.G.1 to small cans of refrigerant. EPA edited the regulatory text at section 84.116(g) to clarify that the requirements do not apply to small cans.

H. How is EPA establishing RCRA refrigerant recycling alternative standards?

EPA is finalizing standards under 40 CFR part 266, subpart Q, that apply instead of the full RCRA Subtitle C hazardous waste requirements to certain ignitable spent refrigerants that are recycled for reuse. The purpose of these standards is to help reduce emissions of ignitable spent refrigerants to the lowest achievable level by maximizing the recovery and safe recycling of such refrigerants during the service, repair, and disposal of appliances.

1. Nomenclature Used in This Section

This section uses the term ''ignitable spent refrigerant'' to describe the refrigerants that are potentially subject to RCRA hazardous waste regulation under the current rules, and that will now be subject to the applicable RCRA alternative standards for refrigerants when recycled for reuse under the final rule. ''Ignitability'' is one of the RCRA hazardous waste characteristics and is used to identify waste that may pose a risk to human health and the environment due to its potential to cause fires if improperly managed.[140] The characteristic of ignitability is defined in 40 CFR 261.21. As discussed in more detail below in this section, ''ignitable'' is similar, but not identical, to the term ''flammable'' as used in ASHRAE Standard 34–2022. ''Spent'' is used in the same context as ''spent material,'' which is defined in 40 CFR 261.1(c)(1) as ''any material that has been used and as a result of contamination can no longer serve the purpose for which it was produced without processing.'' Thus, an ''ignitable spent refrigerant'' is a used refrigerant that cannot be reused without first being cleaned, and that exhibits the hazardous characteristic of ignitability per 40 CFR 261.21.

In addition, the terms ''reclaim'' and ''recycle'' have different regulatory purposes and definitions under RCRA than under the CAA and the AIM Act. Under RCRA, a material is ''reclaimed'' if it is processed to recover a usable product, or if it is regenerated. Examples are recovery of lead values from spent batteries and regeneration of spent solvents (see 40 CFR 261.1(c)(4)). Reclamation is one of the four types of ''recycling'' identified in 40 CFR 261.2(c) that can involve management of a solid waste under RCRA. Materials that are solid waste under RCRA are potentially subject to RCRA hazardous waste requirements.

In contrast, under title VI of the CAA and its implementing regulations, ''reclaim'' is a more precise term, requiring the reclaimed refrigerant to meet regulatory specifications based on AHRI Standard 700–2016, while ''recycle'' means to extract refrigerant from an appliance and clean it for reuse in equipment of the same owner without meeting all of the CAA requirements for reclamation. See those definitions in 40 CFR 82.152. Similarly, under the AIM Act, ''reclaim; reclamation'' is defined in subsection (b)(9) of the Act, and that definition refers to the purity standards under AHRI Standard 700–2016 (or an appropriate successor standard adopted by EPA Administrator) and the verification of purity using, at a minimum, the analytical methodology described in that standard. ''Recycle'' is not defined in the AIM Act.

To avoid confusion when discussing what regulatory requirements apply to ignitable spent refrigerant, for the purposes of the final RCRA alternative standards, EPA is using the term ''recycle for reuse'' as defined at 40 CFR 266.601 to mean to process an ignitable spent refrigerant to remove contamination and prepare it to be used again. This umbrella term includes reclaiming ignitable spent refrigerants as defined in the context of the RCRA regulations at 40 CFR 261.1(c), and either reclaiming or recycling refrigerants as defined in 40 CFR 82.152. ''Recycle for reuse'' would not include recycling that involves burning for energy recovery or use in a manner constituting disposal (use in or on the land) as defined in 40 CFR 261.2(c), or sham recycling as defined in 40 CFR 261.2(g).

2. Background

On February 13, 1991, EPA promulgated an interim final rule excluding spent chlorofluorocarbon (CFC) refrigerants from the definition of hazardous waste under RCRA when recycled for reuse (56 FR 5910). EPA was concerned that subjecting used CFC refrigerants to RCRA hazardous waste regulations would result in increased venting of these refrigerants, resulting in increased levels of ODS in the stratosphere. As described above in section III.C, EPA promulgated a series of rules implementing provisions under CAA title VI to phase out class I and class II ODS, including CFCs used as refrigerants, and establishing standards applicable to the use, disposal, and recycling of ODS refrigerants and their substitutes. Some of these acceptable substitutes are flammable and likely to exhibit the hazardous waste characteristic of ignitability found in 40 CFR 261.21.[141] As described in section I.B, ASHRAE Standard 34–2022 assigns a safety group classification for each refrigerant which consists of two alphanumeric characters (*e.g.,* A2 or B1). The capital letter indicates the toxicity class (''A'' for lower toxicity), and the numeral denotes the flammability. ASHRAE recognizes three classifications and one subclass for refrigerant flammability. The three main flammability classifications are Class 1, for refrigerants that do not propagate a flame when tested as per the ASHRAE 34 standard, ''Designation and Safety Classification of Refrigerants;'' Class 2, for refrigerants of lower flammability; and Class 3, for highly flammable refrigerants, such as certain hydrocarbon refrigerants. ASHRAE recently updated the safety classification matrix to include a new flammability subclass 2L, for flammability Class 2 refrigerants that

[139] Small cans of refrigerant, that typically contain two pounds or less of regulated substances, are commonly used by individuals to service their own MVACs. This do-it-yourself (DIY) servicing practice is unique to the MVAC subsector within the RACHP sector.

[140] EPA 1980, *Background Document for the Hazardous Waste Characteristic of Ignitability,* May 2, 1980, p.7 *https://www.epa.gov/hw/background-document-hazardous-waste-characteristic-ignitability.*

[141] ''Flammability'' as identified by the ASHRAE standards and ''ignitability'' as identified by the RCRA 40 CFR 261.21 standard are both intended to capture the potential for a substance to cause fires. However, since the methodology used under these two systems differs, EPA is using ''flammability'' when describing the ASHRAE standard and ''ignitability'' when describing wastes that are regulated under RCRA when they meet the ignitable characteristic in § 261.21 and therefore are subject to hazardous waste management requirements. In general, a flammable substance would be presumed to be also ignitable under RCRA unless testing were to demonstrate otherwise.

burn very slowly.[142] Since 2010, EPA's SNAP program has listed a number of flammable substitute refrigerants that have ASHRAE safety classifications of A3 (higher flammability, lower toxicity refrigerants such as propane or isobutane) or A2L (lower flammability, lower toxicity refrigerants such as HFC–32 or HFO–1234yf).

The standard for flammability under ASHRAE Standard 34–2022 does not correspond precisely with the RCRA standards for ignitability found in 40 CFR 261.21, but in general, refrigerants with a flammability Class of 2 or 3 are expected to be ignitable under RCRA. Spent refrigerants with a flammability class of 2L may or may not be ignitable hazardous waste, depending on the specific chemical(s) used in the refrigerant and contamination of the refrigerant during use. Note that even refrigerants that do not exhibit the RCRA characteristic of ignitability as a virgin material could become ignitable with use, especially if contaminated with oil or other lubricants, posing a risk of fire if mismanaged.[143] Similarly, the flash point of a refrigerant that is a blend of two or more chemicals can change if there is a leak during operation or during recovery and storage, when the refrigerant from multiple appliances is combined, or if the recovery process is incomplete, potentially changing the hazardous waste characteristic of the spent refrigerant when collected.

It should be noted that these ignitable spent refrigerant substitutes do not fall under the 40 CFR 261.4(b)(12) RCRA exclusion for refrigerants, since that exclusion is limited to CFC refrigerants.[144] The applicability of RCRA to flammable refrigerants is also discussed in the 2016 SNAP final rule (81 FR 86799–86800, December 1, 2016). Consistent with that discussion, EPA does not consider incidental releases of spent refrigerant that occur during the service and repair of appliances subject to CAA section 608 to be disposal of a hazardous waste under RCRA. However, ignitable spent refrigerant from commercial and industrial appliances (*i.e.,* non-household appliances) will be classified as hazardous waste and will need to be managed under the applicable RCRA regulations (40 CFR parts 260 through 270) when recovered (*i.e.,* removed from an appliance and stored in an external container) or disposed of. These requirements include RCRA hazardous waste generator notification and on-site accumulation standards, emergency preparedness and other requirements, hazardous waste manifest and transportation requirements for the ignitable spent refrigerant, and RCRA permit requirements for refrigerant recyclers that store the refrigerant prior to recycling, unless the refrigerants are recycled for reuse under 40 CFR part 266, subpart Q, as described later in this section.

3. Final Alternative RCRA Standards for Ignitable Spent Refrigerants Being Recycled for Reuse

Similar to EPA's concerns expressed in the 1991 rulemaking establishing the CFC refrigerant recycling exclusion, EPA is concerned that applying the full RCRA hazardous waste requirements to substitute refrigerants that exhibit the hazardous characteristic of ignitability would discourage recycling and could result in an increase in releases of ignitable refrigerants, including HFC ignitable refrigerants, contrary to the goals of RCRA. The Agency separately notes that such releases would also be contrary to one of the purposes of regulations under subsection (h)(1) of the AIM Act, which is to minimize releases of HFCs from equipment. Moreover, inadvertently incentivizing releases of refrigerants would be contrary to RCRA section 3004(n), which requires EPA to control air emissions from hazardous waste management, as may be necessary to protect human health and the environment. Finally, the current requirements for recovery of refrigerants under the CAA section 608 rules are more stringent than the recycling requirements under the RCRA 40 CFR 261.6, recyclable materials rules, and help ensure that ignitable spent refrigerants are legitimately recycled for reuse, as well as address the flammability risks posed by ignitable spent refrigerants.

For the reasons stated above, EPA is finalizing standards under 40 CFR part 266, subpart Q, applicable to certain ignitable spent refrigerants that are recycled for reuse that will apply instead of the full RCRA Subtitle C hazardous waste requirements. The purpose of these standards is to help reduce emissions of ignitable spent refrigerants to the lowest achievable level by maximizing the recovery and safe recycling of such refrigerants during the service, repair, and disposal of appliances.

EPA proposed that 40 CFR part 266, subpart Q, RCRA alternative standards would apply to HFCs and substitutes that are lower flammability (*i.e.,* that do not belong to flammability Class 3). In this final action, consistent with the proposal, EPA is keeping the applicability of the alternative standards to the lower flammability substitutes because of the lower risk of fire from the collection and recycling for reuse of these refrigerants, and the greater market value of these refrigerants, which supports the conclusion that these spent refrigerants will be recycled for reuse and not stockpiled, mismanaged, or abandoned. In the context of hazardous secondary materials recycled under RCRA, EPA has found that a low market value for a reclaimed product can increase the likelihood of mismanagement and abandonment occurring during hazardous waste recycling activities.[145]

Lower flammability spent refrigerant means a spent refrigerant that is not considered highly flammable. Highly flammable refrigerants include, but are not limited to the following chemicals: butane, isobutane, methane, propane, and/or propylene. EPA did not receive comments on the proposed definition of "lower flammability spent refrigerant." However, the Agency is modifying the definition in this final rule to provide examples of refrigerants that are considered highly flammable.

a. Comments on the RCRA Alternative Standards and Changes Made in Response to Comments

EPA received 17 public comments on the proposed RCRA alternative standards. All comments were supportive of EPA finalizing alternative standards that are specifically designed for ignitable spent refrigerant being recycled for reuse instead of imposing the standard RCRA Subtitle C hazardous waste requirements on these waste streams. Accordingly, EPA is finalizing these standards largely as proposed.

However, several comments raised concerns regarding applying the speculative accumulation limit to storage of ignitable spent refrigerants at reclamation facilities.[146] As noted in the

[142] ASHRAE Fact Sheet *Update on New Refrigerants Designations and Safety Classification* November 2022. *https://www.ashrae.org/file%20library/technical%20resources/bookstore/factsheet_ashrae_english_november2022.pdf.*

[143] S N Kopylov et al 2019 IOP Conf. Ser.: Earth Environ. Sci. 272 022064; *https://iopscience.iop.org/article/10.1088/1755-1315/272/2/022064.*

[144] EPA did not reopen the original CFC refrigerant recycling exclusion and did not request comment on 40 CFR 261.4(b)(12).

[145] U.S. EPA, A Study of the Potential Effects of Market Forces on the Management of Hazardous Secondary Materials Intended for Recycling, November 2006, available at *https://www.regulations.gov/document/EPA-HQ-RCRA-2002-0031-0358.*

[146] See comment numbers EPA–HQ–OAR–2022–0606–0084, EPA–HQ–OAR–2022–0606–0085, EPA–HQ–OAR–2022–0606–0102, EPA–HQ–OAR–2022–0606–0109, EPA–HQ–OAR–2022–0606–0111, EPA–

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proposal (88 FR 72275, October 19, 2023), restrictions on speculative accumulation have been an important element of the RCRA hazardous waste recycling regulations since they were originally promulgated on January 4, 1985 (50 FR 634 through 637). According to this regulatory provision, the person accumulating the hazardous secondary material must demonstrate that the material is recyclable and that during a calendar year (beginning January 1) the amount of such material that is recycled or transferred to a different site for recycling is at least 75 percent by weight or volume of the amount of the hazardous secondary material present at the beginning of the calendar year (January 1).

Comment: Commenters stated that requiring reclaimers to process 75 percent of these refrigerants within one year would be very challenging for most reclaimers. In particular, commenters noted that due to a very small initial installed equipment base and low equipment service rates in the first years of the HFC phasedown, limiting the accumulation period to a one-year maximum would require processing of extremely small quantities, which would be an inefficient use of reclaimer resources.

Response: EPA notes that there is an existing provision at 40 CFR 260.31(a) that allows facilities to petition EPA for an extension of the speculative accumulation time limit if the applicant demonstrates that sufficient amounts of the material will be recycled or transferred for recycling in the following year. Applicants must follow the procedures in 40 CFR 260.33.

However, given that the potential limitations in the quantities available to be processed would be an industry-wide issue during the first years of the HFC phasedown, EPA agrees with the commenters that a delayed compliance date for the speculative accumulation requirement is warranted. This delayed compliance date is a more efficient use of resources than requiring each affected facility to petition the Agency for an extension and would allow time to build up supply to make reclamation more economical for the reclamation facility.

Accordingly, EPA is delaying the compliance date for the speculative accumulation time limit until the calendar year 2029. Up until January 1, 2029, reclamation facilities may accumulate ignitable spent refrigerants without recycling them for reuse as long as the other requirements of the alternative RCRA standards are met. The speculative accumulation limits would then begin to apply during calendar year 2029. In other words, by December 31, 2029, reclaimers must reclaim 75 percent of the inventory of ignitable spent refrigerant that was present on-site on January 1, 2029. If they will be unable to meet this deadline, they may submit a petition for an extension under 40 CFR 260.31 using the procedures in 40 CFR 260.33, or they must manage their inventory of ignitable spent refrigerant as hazardous waste.

Comment: One commenter requested clarification on how the new RCRA alternative standards would apply to persons who receive refrigerants from off-site but do not recycle them for reuse.[147]

Response: EPA agrees that if a facility receives ignitable spent refrigerant but does not recycle it for reuse, then it should not be subject to the proposed standard that requires off-site facilities to maintain certification by EPA under 40 CFR 82.164. (See 88 FR 72275, October 19, 2023). However, if such a facility stores the ignitable spent refrigerant for more than 10 days in the normal course of transportation,[148] the same requirements regarding speculative accumulation and the risks of fire and explosions that EPA identified in the proposal concerning off-site facilities receiving and accumulating ignitable spent refrigerants would still apply (88 FR 72275–72276, October 19, 2023). Thus, in the final rule EPA is including clarifying language to explain that persons who receive ignitable spent refrigerants from off-site, and are not a transfer facility that stores the refrigerants for less than 10 days before sending the refrigerant to another site to be recycled for reuse must: (1) Meet the emergency preparedness and response requirements of 40 CFR part 261, subpart M; and (2) not speculatively accumulate the ignitable spent refrigerant per 40 CFR 261.1(c). This could include those in the reverse supply chain (*e.g.,* distributors or wholesalers) or final processors who receive disposable cylinders and remove heels and consolidate them before discarding the cylinder (see section IV.G.1).

Comment: Finally, one commenter suggested a number of technical corrections and editorial clarifications to the proposed regulatory language for the alternative RCRA standards including a suggestion that EPA remove the term ''alternative,'' since the new requirements are not optional.[149]

Response: EPA has made revisions to the language in response to these suggestions. In regard to the comment requesting that EPA remove the description of the new RCRA standards as ''alternative,'' EPA agrees with the comment that they are not optional for persons who wish to recycle ignitable spent refrigerant for reuse. However, the new standards do provide an alternative to the requirements for hazardous waste disposal at 40 CFR parts 262 through 270, and the term was used extensively in the proposed rule and communications materials. Thus, EPA is maintaining the description of the new 40 CFR part 266, subpart Q, as ''alternative standards'' to distinguish them from the RCRA hazardous waste disposal standards, but has removed the term from the subpart Q standards themselves. For more information on public comments on the proposed RCRA alternative standards, and EPA's responses, please see *RCRA Alternative Standards for Ignitable Spent Refrigerants: Response to Comments Document* available in the docket.

b. Scope of the Final RCRA Alternative Standards

The RCRA alternative standards at 40 CFR part 266, subpart Q, apply to HFCs and substitutes that do not belong to flammability Class 3. Class 3 refrigerants are highly flammable refrigerants that include, but are not limited to, any of the following chemicals: butane, isobutane, methane, propane, and/or propylene. The alternative standards are limited to lower flammability substitutes (Class 1, 2 and 2L)[150] because of the lower risk of fire from the collection and recycling for reuse of these refrigerants, and the greater market value of these refrigerants, which supports the conclusion that these spent refrigerants will be recycled for reuse and not stockpiled, mismanaged, or abandoned. In the context of hazardous waste recycled under RCRA, EPA has found that a low market value for a reclaimed product can increase the likelihood of mismanagement and abandonment

HQ–OAR–2022–0606–0113, and EPA–HQ–OAR–2022–0606–0159 in the docket.

[147] See comment number EPA–HQ–OAR–2022–0606–0152 in the docket.

[148] Facilities that store less than ten days in the normal course of transportation are considered to be transfer facilities as defined in 40 CFR 260.10 and are generally not subject to RCRA requirements. See 40 CFR 263.12.

[149] See comment number EPA–HQ–OAR–2022–0606–0091 in the docket.

[150] Class 1 refrigerants are nonflammable and generally not expected to be ignitable, and therefore not subject to RCRA requirements. However, if a spent Class 1 refrigerant were ignitable due to contamination with oil or other lubricants, it would be subject to the alternative RCRA standards.

occurring during hazardous waste recycling activities.

EPA did not receive any comments on the proposed definition of ''lower flammability spent refrigerant'' but, in order to provide greater clarity and simplify implementation, in lieu of referring to the ANSI/ASHRAE standard, EPA is including in the regulatory definition the list of specific chemicals that are considered Class 3 ''highly flammable'' refrigerants and therefore are not lower flammability refrigerants.

c. Requirements of the RCRA Alternative Standards

The specific standards EPA is finalizing for ignitable spent refrigerants being recycled for reuse for further use in equipment of the same owner, or by the owner of the recovery equipment in compliance with MVAC standards in 40 CFR part 82, subpart B, are (1) the ignitable spent refrigerants are recovered (*i.e.,* removed from an appliance and stored in an external container) and/or recycled for reuse using equipment that is certified for that type of refrigerant under 40 CFR 82.36 or 40 CFR 82.158; and (2) the ignitable spent refrigerants are not speculatively accumulated as defined in 40 CFR 261.1(c).

The specific standards that EPA is finalizing for facilities receiving refrigerant from off-site to be recycled for reuse are (1) the reclaimer must maintain certification by EPA under 40 CFR 82.164; (2) the facility must meet the applicable emergency preparedness and response requirements of 40 CFR part 261, subpart M; and (3) the ignitable spent refrigerants must not be speculatively accumulated as defined in 40 CFR 261.1(c). These requirements are included as part of the RCRA alternative standard in order to ensure that the ignitable spent refrigerants are legitimately recycled for reuse in a way that is protective of human health and the environment. For facilities that receive ignitable spent refrigerant from off-site and store the refrigerant for more than 10 days and then send the refrigerant on to a reclaimer to be recycled for reuse: (1) The facility must meet the applicable emergency preparedness and response requirements of 40 CFR part 261, subpart M; and (2) the ignitable spent refrigerants must not be speculatively accumulated as defined in 40 CFR 261.1(c).

The requirement that the recovery and/or recycling equipment be certified for that type of refrigerant and appliance under 40 CFR 82.36 (for MVAC systems), or 40 CFR 82.158 (for recycling for reuse in appliances by the same owner) specifically addresses the ignitability hazard during refrigerant recovery and recycling for reuse at MVAC recycling operations in compliance with 40 CFR part 82, subpart B, or for recycling for reuse in appliances by the same owner. In particular, appendix B4 to subpart F of 40 CFR part 82—Performance and Safety of Flammable Refrigerant Recovery and/or Recycling Equipment—requires all recovery and/or recycling equipment to be tested to meet standards for the test apparatus, test gas mixtures, sampling procedures, analytical techniques, and equipment construction that will be used to determine the performance and safety of refrigerant recovery.

The requirement that the spent refrigerant regulated under the new alternative standards not be speculatively accumulated per 40 CFR 261.1(c) will help prevent over-accumulation, mismanagement, and abandonment of the spent refrigerant. Restrictions on speculative accumulation have been an important element of the RCRA hazardous waste recycling regulations since they were originally promulgated on January 4, 1985 (50 FR 634 through 637). According to this regulatory provision, hazardous secondary materials as defined in 40 CFR 260.10 (which would include ignitable spent refrigerants) are accumulated speculatively if the person accumulating them cannot demonstrate that the material is potentially recyclable. Further, the person accumulating the hazardous secondary material must demonstrate that during a calendar year (beginning January 1), the amount of such material that is recycled or transferred to a different site for recycling is at least 75 percent by weight or volume of the amount of the hazardous secondary material present at the beginning of the calendar year (January 1). Hazardous secondary materials to be recycled must be placed in a storage unit with a label indicating the first date that the material began to be accumulated, or the accumulation period must be documented through an inventory log or other appropriate method. Otherwise, the hazardous secondary material is considered to be speculatively accumulated and not eligible for the alternative standards in 40 CFR part 266, subpart Q.

Facilities that are unable to comply with the speculative accumulation time limits do have the option of petitioning EPA for a variance per 40 CFR 260.31(a), using the procedures in 40 CFR 260.33, to extend the timeframe for one year. However, as noted in the discussion of public comments in section IV.H.3.a of this preamble, EPA is aware that the availability of ignitable spent refrigerants may be limited during the early years of the HFC phasedown, and accordingly is delaying the compliance date for speculative accumulation at reclamation facilities until calendar year 2029. Therefore, up until January 1, 2029, reclamation facilities may accumulate ignitable spent refrigerants without recycling them for reuse as long as the other requirements of the RCRA alternative standards are met. The speculative accumulation limits would then begin to apply during calendar year 2029. In other words, by December 31, 2029, reclaimers must reclaim 75 percent of the inventory of ignitable spent refrigerants that was present on January 1, 2029. If they will be unable to meet this deadline, they may submit a petition for an extension under 40 CFR 260.31 using the procedures in 40 CFR 260.33, or they must manage their inventory of ignitable spent refrigerants as RCRA hazardous waste.

The requirement that facilities receiving refrigerant from off-site to be recycled for reuse maintain certification by EPA under 40 CFR 82.164 helps ensure that the recycler is experienced in proper refrigerant reclamation techniques and will manage the spent refrigerant in a manner that minimizes releases, with an explicit limit under the CAA section 608 rules of no more than 1.5 percent of the refrigerant released during the reclamation process (see 40 CFR 82.164(a)(3)). The certification requirement also helps with the transparency of the RCRA alternative standards since the list of EPA-certified refrigerant reclaimers is publicly available on EPA's website.[151] In addition, these facilities are certified reclaimers under CAA section 608 and must follow recordkeeping and reporting requirements per 40 CFR 82.164(d) including (1) maintaining records of the names and addresses of persons sending them material for reclamation and the quantity of the material (the combined mass of refrigerant and contaminants) sent to them for reclamation; and (2) reporting annually the quantity of material sent to them for reclamation by refrigerant type, the mass of refrigerant reclaimed by refrigerant type, and the mass of waste products. Finally, EPA-certified refrigerant reclaimers must verify that each batch of reclaimed refrigerant meets the specifications in the regulations (40 CFR 82.164(a)(2)), which

[151] EPA-Certified Refrigerant Reclaimers *https://www.epa.gov/section608/epa-certified-refrigerant-reclaimers.* Last updated June 13, 2024.

helps ensure that the reclamation process is legitimate recycling under the RCRA regulations.

EPA notes that reclaimed refrigerant that does not meet the required specifications would be considered an off-specification (''off-spec'') commercial chemical product under 40 CFR 261.2(c). If there is an allowable use for the off-spec reclaimed refrigerant and the material is used as an effective substitute for commercial product, it may be exempt from RCRA under the use/reuse provisions of 40 CFR 261.2(e). If the off-spec reclaimed refrigerant goes to further legitimate reclamation, it could also be exempt from RCRA under 40 CFR 261.2(c)(3). If the ignitable, off-spec reclaimed refrigerant cannot be either legitimately reused or further reclaimed, it would need to be managed as a hazardous waste.

EPA further notes that persons who reclaim HFCs that are listed as regulated substances under the AIM Act must meet the recordkeeping and reporting requirements as set forth in 40 CFR 84.31(a) and 84.31(i).

Finally, including the requirement that facilities receiving refrigerant to be recycled for reuse, or that store the refrigerant for more than 10 days before sending it on to be recycled for reuse, must meet the RCRA standards under 40 CFR part 261, subpart M, Emergency Preparedness and Response for Management of Excluded Hazardous Secondary Materials, addresses the risks posed specifically by ignitable spent refrigerants, which are a subset of hazardous secondary materials.[152] Facilities receiving ignitable spent refrigerants from other parties for recycling for reuse will be subject to this additional emergency preparedness requirement because these third-party recyclers will receive ignitable spent refrigerants from multiple sources and are likely to store greater volumes for longer time periods than companies that recycle for reuse in appliances by the same owner or as part of an MVAC refrigerant recovery and recycling system in compliance with 40 CFR part 82, subpart B. These emergency preparedness and response requirements include maintaining appropriate emergency equipment on-site, having access to alarm systems, maintaining needed aisle space, making arrangements with local emergency authorities, and having a designated emergency coordinator who is responsible for responding in the event of an emergency. This requirement will help protect human health and the environment in the event of a fire or other emergency at the facility. Under the final rule, all facilities receiving ignitable spent refrigerant from off-site, except for 10-day transfer facilities, must meet the emergency preparedness and response requirements under 40 CFR 261.410 and 40 CFR 261.420, which include general personnel training requirements for facilities (40 CFR 261.420(g)).

4. RCRA Very Small Quantity Generator Wastes

Very Small Quantity Generators (VSQGs) generate less than 100 kilograms of hazardous waste per month and one kilogram or less per month of acutely hazardous waste and are subject to a limited set of Federal RCRA Subtitle C hazardous waste regulations, provided that they comply with the conditions set forth in 40 CFR 262.14. Among those conditions is that the VSQG must either treat and dispose of its hazardous waste in an on-site facility or ensure delivery to an off-site facility listed in 40 CFR 262.14(a)(5). Included in this list is a facility that (1) beneficially uses or reuses, or legitimately recycles or reclaims, its waste; or (2) treats its waste prior to beneficial use or reuse, or legitimate recycling or reclamation.

For ignitable spent refrigerant regulated under the new RCRA alternative standards, EPA is finalizing a conforming change to 40 CFR 262.14(a)(5) to require that these refrigerants be sent to a facility that meets the requirements of 40 CFR part 266, subpart Q if sent off-site for recycling. This revision incorporates into the RCRA regulations that VSQGs' ability to send ignitable spent refrigerants for recycling for reuse is limited to facilities that meet EPA's certification requirements in 40 CFR 82.164. This revision does not affect refrigerants not subject to the new RCRA alternative standards (*e.g.,* ignitable spent refrigerants that are not sent off-site to be recycled for reuse).

EPA notes that while this change is more stringent than the current RCRA regulations, VSQGs would experience no additional burden since under the CAA section 608 rules, all reclaimers receiving used ODS refrigerants or non-exempt substitute refrigerants from off-site for reclamation must meet EPA's certification requirements in 40 CFR 82.164.

5. RCRA Regulation of Exports and Imports of Certain Ignitable Spent Refrigerants

The RCRA alternative standards are limited to ignitable spent refrigerants that are recycled for reuse in the United States, and they require that off-site recycling for reuse be performed at an EPA-certified reclaimer per 40 CFR 82.164. Therefore, ignitable spent refrigerants intended for export would not qualify for the RCRA alternative standards, and would instead be regulated under the full RCRA Subtitle C requirements, including the relevant hazardous waste export requirements in 40 CFR part 262, subpart H.

Ignitable spent refrigerants that are imported would qualify for alternative RCRA standards, as long as the imported refrigerants meet the requirements of the RCRA alternative standards, including being recycled for reuse at an EPA-certified reclaimer per 40 CFR 82.164. This provision does not amend, reopen or otherwise affect any of the requirements for regulated substances established under the AIM Act that are codified at 40 CFR part 84, subpart A.

6. Applicability of Alternative Standard in RCRA-Authorized States

Under section 3006 of RCRA, EPA may authorize a State hazardous waste program to operate in lieu of the Federal program within the State. Following authorization, EPA maintains its enforcement authorities, although authorized States have primary enforcement responsibility for their authorized programs. The standards and requirements for state authorization are found in 40 CFR part 271.

Prior to the enactment of the HSWA, an authorized state hazardous waste program operated entirely in lieu of the Federal program in that state. The Federal requirements no longer applied in the authorized state, and EPA could not issue permits for any facilities in that state. When new, more stringent, or broader Federal requirements were promulgated, the state was obligated to adopt equivalent authorities under state law within specified time-frames. However, new requirements did not take effect in an authorized state until the state adopted such equivalent authorities, and these requirements did not become part of the authorized program enforceable by EPA until EPA authorized them.

In contrast, with the enactment of RCRA section 3006(g), which was added by HSWA, new Federal requirements and prohibitions imposed pursuant to HSWA authority take effect in

[152] Per 40 CFR 260.10, ''hazardous secondary materials'' means a secondary material (*e.g.,* spent material, by-product, or sludge) that, when discarded, would be identified as hazardous waste under 40 CFR part 261. Ignitable spent refrigerant meets this definition.

authorized states at the same time that they take effect in unauthorized States. EPA is directed by section 3006(g) to implement HSWA-based requirements and prohibitions in authorized States until EPA authorizes equivalent State authorities. While States must still adopt state-law equivalents to HSWA-based requirements and prohibitions to retain final authorization, until the States do so, and EPA authorizes the state-law equivalents, EPA implements and enforces these provisions in authorized States.

Authorized states are required to modify their programs when EPA promulgates Federal requirements that are more stringent or broader in scope than existing Federal requirements. RCRA section 3009 allows the States to impose standards more stringent than those in the Federal program (see also 40 CFR 271.1). If EPA promulgates a Federal requirement that is less stringent or narrower in scope than an existing requirement or of equivalent stringency, authorized States may, but are not required to, adopt a new equivalent requirement regardless of whether or not it is promulgated under HSWA authority.

7. Effect on State Authorization

The RCRA regulations described in this final rule are promulgated under the authority of HSWA and are more stringent than the existing Federal regulations. Thus, the standards will be applicable on the rule's effective date in all States and will be implemented and enforced by EPA until the States receive authorization. These RCRA regulations add a new subpart, Q, to 40 CFR part 266, *Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities*, and are being finalized under the authority of HSWA due to their purpose of reducing air emissions from the management of ignitable spent refrigerants, in accordance with EPA's mandate to control air emissions from hazardous waste management, as may be necessary to protect human health and the environment, per RCRA section 3004(n), which was promulgated under HSWA. In addition, the changes to the VSQG Regulations in 40 CFR 262.14 are being promulgated under RCRA section 3001(d)(4), also a HSWA provision.

The final alternative standard establishes a ''cradle-to-cradle'' management system for ignitable spent refrigerants being recycled for reuse and includes requirements that are more stringent than the current applicable RCRA recycling requirements in 40 CFR 261.6(c), which exempts the recycling process itself from RCRA regulation. This final management system includes the requirement that refrigerant be recovered and/or recycled for reuse in appliances by the same owner using equipment that is certified for that type of refrigerant and appliance under 40 CFR 82.36 or 82.158, and that the recovered refrigerant be sent off-site to be recycled for reuse at a facility certified by EPA under 40 CFR 82.164. Both of these provisions are more stringent than the existing RCRA recycling requirements. In addition, the revisions to the VSQG regulations in 40 CFR 262.14 specify that VSQGs' ability to send ignitable spent refrigerant for recycling for reuse is limited to facilities that meet EPA's certification requirements in 40 CFR 82.164 and are more stringent than the current standard. These certifications in 40 CFR 82.164 involve a number of requirements for reclamation that are more stringent than those under the RCRA hazardous waste program, including an explicit limit of no more than 1.5 percent of the refrigerant released during the reclamation process (see 40 CFR 82.164(a)(3)). In addition, these certified reclaimers must follow recordkeeping and reporting requirements per 40 CFR 82.164(d), including (1) maintaining records of the names and addresses of persons sending them material for reclamation and the quantity of the material (the combined mass of refrigerant and contaminants) sent to them for reclamation and (2) reporting annually the quantity of material sent to them for reclamation by refrigerant type, the mass of refrigerant reclaimed by refrigerant type, and the mass of waste products. Finally, EPA-certified refrigerant reclaimers must verify that each batch of reclaimed refrigerant meets the specifications in the regulations (40 CFR 82.164(a)(2)), which helps ensure that the reclamation process is legitimate recycling under the RCRA regulations. These alternative standards are designed to function as a system that is better tailored to the reclamation of ignitable spent refrigerants than the RCRA requirements in 40 CFR 262–270, and when considered as a whole are more stringent when compared to the previously applicable RCRA recycling requirements.

Moreover, as stated above, authorized States are required to modify their programs when EPA promulgates Federal regulations that are more stringent or broader in scope than the authorized State regulations. Because the revisions in this rule are considered to be more stringent than the existing Federal requirements, authorized States must modify their programs to adopt regulations equivalent to the provisions contained in this final RCRA rule.

I. MVAC Servicing and Reprocessed Material

EPA did not propose, and therefore is not establishing requirements focused on implementing subsection (h)(2)(B) for MVAC servicing facilities that currently reclaim or recycle recovered MVAC refrigerant in this action. As stated at proposal, EPA understands that under current industry practices, a variety of things might occur once refrigerant has been recovered from an MVAC system. For example, in some situations, MVAC servicing facilities recover refrigerant from the MVAC, recycle it consistent with EPA's regulations under CAA section 609, and return the recycled refrigerant to the same MVAC for continued use by the same owner.[153] In other circumstances, however, EPA understands that the recovered MVAC refrigerant is recycled and used in servicing a different MVAC system with a different owner (*e.g.,* to charge or recharge such a system), thereby in effect selling or transferring the refrigerant to a new owner. See 40 CFR 82.34(d)(2). Additionally, the Agency understands that there are circumstances where refrigerant recovered from MVAC systems is reclaimed before it is reused, sold, or transferred to a new owner.

The servicing and repair of MVAC systems with HFCs and HFC substitutes (*e.g.,* HFO–1234yf and R–744 (CO_2)) have long been subject to certain requirements that are separate from those that apply for the servicing and repair of stationary appliances. Regulations under CAA section 609 require that section 609-certified technicians use equipment approved pursuant to the standards at 40 CFR 82.36 to service and repair MVAC systems. Under those existing regulations, recovered refrigerant can either be recycled on-site or off-site using approved equipment designed to both recover and recycle refrigerant certified to meet SAE J2099.[154] SAE J2099 establishes the minimum level of refrigerant purity (*e.g.,* 98 percent for HFO–1234yf) required for the certification of on-site recovery and recycling machines per SAE J2843 and SAE J2788. Refrigerant from reclamation

[153] Another example of an instance where there is no change in ownership is the off-site servicing and recharge of MVAC systems for a fleet of trucks that are owned by the same company.

[154] SAE International, 2012. SAE J2099: Standard of Purity for Recycled R–134a (HFC–134a) and R–1234yf (HFO–1234yf) for Use in Mobile Air-conditioning Systems.

facilities that is used for the purpose of recharging MVACs must be at or above the standard of purity (*i.e.,* 99.5 percent) level defined in AHRI Standard 700, and EPA understands that such reclamation typically occurs off-site. See 40 CFR 82.32(e)(2).

Due to the longstanding practice of on-site recycling of single-component MVAC refrigerants, some industry stakeholders [155] questioned the need to reclaim recovered MVAC refrigerant to meet the purity level described in AHRI Standard 700–2016 as specified in the definition of the terms ''reclaim'' and ''reclamation'' in subsection (b)(9) of the Act. They noted that equipment certified to meet SAE J2099 is rated to clean and separate material in contaminated refrigerant to a 98 percent purity level, which provides the same level of performance and durability as virgin refrigerant for purposes of use in MVACs. They also pointed out the ambiguity in the phrase ''(or an appropriate successor standard adopted by the Administrator)'' in the definition of ''reclaim'' and ''reclamation'' in the AIM Act. While there may be a variety of situations that could lead to the adoption of a successor standard by the Administrator within the meaning of subsection (b)(9), in EPA's view one such circumstance would be if AHRI published a subsequent standard or addendum regarding the reprocessing of a recovered regulated substance to a specified purity standard and the analytical methodology to verify the purity of that regulated substance, and that standard were adopted by the Administrator as a successor standard.

EPA is aware that AHRI is in consultations with SAE International, the Mobile Air Climate Systems Association (MACS), and other industry stakeholders to develop a standard (or update an existing standard) that may be more appropriate for MVAC servicing than AHRI Standard 700–2016.[156] If such a standard is finalized, EPA intends to review it, and any supporting information, and consider what implications it might have for potential approaches that the Agency might consider in future rulemakings to implement subsection (h)(2)(B) for MVAC systems. Additionally, the Agency could consider establishing its own purity standard and analytical methodology for verification of the purity of recovered regulated substances, as well as specifying minimum equipment requirements for MVAC systems under subsection (h). Among other things, such a standard could be based on consideration of input from stakeholders and consensus standards bodies. EPA could consider adopting any such standard in a future rulemaking. In light of the time needed to develop such standards (whether developed by EPA or standard-setting organizations) and for EPA to consider whether they are appropriate for the Agency to adopt as successor standards in the context of subsection (h), as well as the implications that such standards might have on the regulations that EPA might propose to implement subsection (h)(2)(B) for MVAC systems, EPA did not propose such regulations. Instead, EPA intends to issue proposed regulations for this sector at a later date, once it has additional clarity on the development of such a successor standard and its likely content. Additionally, the Agency may need to consider potential approaches for the recycling and/or reclaiming of MVAC refrigerant blends, which may include regulated substances and/or substitutes for regulated substances, particularly given use of blends would be a significant departure from industry past practice for MVAC systems.

Comment: One commenter stated that they support the AIM Act and engaged early with EPA to share their ongoing process for ''phasing out HFCs.'' The commenter stated that their members fully support the goals of phasing HFCs out of their vehicles sold in the United States, and that their member companies have been undergoing this transition for many years.

Response: EPA acknowledges these comments and their support of the AIM Act. To the extent that these comments relate to EPA actions under other provisions of the AIM Act, such as the HFC phasedown or restrictions under subsection (i) of the AIM Act, they are beyond the scope of this rulemaking and thus require no further response.

Comment: Three commenters supported the Agency's decision to not issue requirements under subsection (h)(2)(B) for MVAC servicing facilities. One commenter noted that the MVAC sector is unique, with regulations under 40 CFR part 82, subpart B, allowing recovered and recycled refrigerant to be returned to the same MVAC for continued use by the same owner or used to service a different MVAC system. Another commenter stated that implementing requirements under the AIM Act for the MVAC sector or requiring the return of refrigerant heel in disposable cylinders to reclaimers would have a significant cost impact with limited environmental benefits. The commenter further stated that SAE standards already require section 609-certified technicians to recover the refrigerant heel in disposable cylinders and that refrigerant heel amounts are less than one pound under SAE J2788 standards specifications performed in laboratory testing.

Response: EPA acknowledges these comments. EPA did not propose and is not finalizing requirements in this rulemaking under subsection (h)(2)(B) of the AIM Act for MVAC servicing facilities that currently reclaim or recycle recovered MVAC refrigerant. Thus, EPA need not further address the points in these comments related to such requirements.

Comment: A few commenters expressed support of EPA's decision to give time for SAE, AHRI, MACS, other industry stakeholders, and/or other entities to consider a new purity standard for MVAC systems. One commenter noted that the ''appropriate successor standard'' provision under the AIM Act would allow the current practice of on-site recycling of MVAC refrigerant prior to transfer of ownership to continue through either a modified version of AHRI 700 or, preferably, an updated version of SAE J2099. Another commenter stated that they supported the Agency's decision to defer to AHRI and SAE to develop an updated standard or standards and mentioned that AHRI has a long track record of developing robust industry standards and is best poised to update Standard 700–2016. One commenter stated that SAE is currently reviewing and revising SAE J2099 to address concerns in the auto sector about using purity-based refrigerant compositions rather than performance-based metrics as a basis for decisions on whether a vehicle must be recovered, or if the material can be recycled.

Response: EPA acknowledges these comments. As noted previously, EPA did not propose and is not finalizing requirements under subsection (h)(2)(B) of the AIM Act for MVAC servicing facilities that currently reclaim or recycle recovered MVAC refrigerant in this rulemaking. Thus, EPA need not further address the points in these comments related to such requirements. Further, as explained earlier in this section, EPA intends to consider issuing such proposed regulations for this sector at a later date. The Agency reminds stakeholders that the regulatory provisions under CAA sections 608 and

[155] March 6, 2023, EPA meeting with Mobile Air Climate Systems (MACS) Association and SAE International. Meeting materials available in the docket (EPA–HQ–OAR–2022–0606) for this rulemaking at *https://www.regulations.gov.*

[156] Letter to EPA from AHRI, Alliance for Automotive Innovation, Alliance for Responsible Atmospheric Policy, and MACS dated June 9, 2023. Available in the docket (EPA–HQ–OAR–2022–0606) for this rulemaking at *https://www.regulations.gov.*

609 continue to apply and cover both servicing and end-of-life for MVAC systems.

Comment: One commenter stated that EPA should require 100 percent reclaimed refrigerant in all small containers of MVAC refrigerant by 2027, consistent with CARB's Small Container of Automotive Refrigerant regulation. The commenter stated that after conversations will stakeholders, they anticipate that there will be enough supply of reclaimed HFC–134a to meet demand for the refrigerant.

Response: EPA responds that the Agency did not propose and is not finalizing use of 100 percent reclaimed refrigerant in small containers of MVAC refrigerant. For reasons explained in section IV.E, the requirements related to the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs in the final rule are limited to stationary equipment.

V. How is EPA treating data reported under this rule?

Consistent with EPA's commitment to transparency in program implementation, as well as to proactively encourage compliance, support enforcement of program requirements and enable third-party engagement to complement EPA's enforcement efforts, The Agency is finalizing requirements for the treatment and release of data that it will collect. EPA is finalizing certain categorical emission data and confidentiality determinations for individual reported data elements that EPA will collect through this rulemaking. This action identifies certain information categories that must be submitted to EPA and will be subject to disclosure to the public without further notice because the information has been determined to be either ''emission data'' under 40 CFR 2.301(a), or the Agency has found that the information does not meet the standard for confidential treatment under Exemption 4 of the Freedom of Information Act (FOIA). EPA has also identified certain other categories of information that may be entitled to confidential treatment. For information EPA is not determining in this rulemaking to be emission data or not otherwise entitled to confidential treatment, EPA will apply the 40 CFR part 2 process for establishing case-by-case confidentiality determinations. As explained further in the following discussion, the emission data and confidentiality determinations in this action are intended to increase the efficiency with which the Agency responds to FOIA requests and to provide consistency in the treatment of the same or similar information. Establishing these determinations through this rulemaking provides predictability for both information requesters and submitters. The emission data and confidentiality determinations in this rule will also increase transparency, as well as supporting compliance with, and enforcement of, the program's requirements.

A. Background on Determinations of Whether Information Is Entitled to Treatment as Confidential Information

1. Confidential Treatment of Reported Information

Regulated entities that must submit information to EPA frequently claim that some or all of that information is entitled to confidential treatment and therefore exempt from disclosure under Exemption 4 of the FOIA.[157] Exemption 4 exempts from disclosure ''trade secrets and commercial or financial information obtained from a person [that is] privileged or confidential.'' [158] In order for information to meet the requirements of Exemption 4, EPA must find that the information is either: (1) A trade secret, or (2) commercial or financial information that is: (a) Obtained from a person, and (b) privileged or confidential.

Generally, when the Agency has information that it intends to disclose publicly that is covered by a claim of confidentiality under FOIA Exemption 4, EPA has a process to make case-by-case or class determinations under 40 CFR part 2 to evaluate whether such information qualifies for confidential treatment under the exemption.[159] [160] In this action, EPA is providing clarity concerning certain categorical emission data and confidentiality determinations for some information that must be submitted to EPA under these requirements. For those determinations, that information would be subject to disclosure to the public without further notice.

The U.S. Supreme Court decision in *Food Marketing Institute* v. *Argus Leader Media,* 139 S. Ct. 2356 (2019) (*Argus Leader*) addresses the meaning of ''confidential'' within the context of FOIA Exemption 4. The Court held that ''[a]t least where commercial or financial information is both customarily and actually treated as private by its owner and provided to the government under an assurance of privacy, the information is 'confidential' within the meaning of Exemption 4.'' [161] The Court identified two conditions ''that might be required for information communicated to another to be considered confidential.'' [162] Under the first condition, ''information communicated to another remains confidential whenever it is customarily kept private, or at least closely held, by the person imparting it.'' [163] The second condition provides that ''information might be considered confidential only if the party receiving it provides some assurance that it will remain secret.'' [164] The Court found the first condition necessary for information to be considered confidential within the meaning of Exemption 4, but did not address whether the second condition must also be met.

Following the issuance of the Court's opinion in *Argus Leader,* the U.S. Department of Justice (DOJ) issued guidance concerning the confidentiality prong of Exemption 4, articulating ''the newly defined contours of Exemption 4'' post- *Argus Leader.*[165] Where the government provides an express or implied indication to the submitter prior to or at the time the information is submitted to the government that the government would publicly disclose the information, then the submitter generally cannot reasonably expect confidentiality of the information upon submission, and the information is not entitled to confidential treatment under Exemption 4.[166] Information will not be kept confidential and will be disclosed publicly if it is determined to not be entitled to confidential treatment in this rule. This is aligned with the Supreme

[157] 5 U.S.C. 552(b)(4).

[158] 5 U.S.C. 552(b)(4).

[159] 40 CFR 2.205.

[160] This approach of making categorical determinations for a class of information is a well-established Agency practice. Prior examples of rules where EPA has made such categorical determinations include *Confidentiality Determinations for Data Required Under the Mandatory Greenhouse Gas Reporting Rule and Amendments to Special Rules Governing Certain Information Obtained Under the Clean Air Act* (76 FR 30817) (May 26, 2011); *Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards* (88 FR 4296) (January 24, 2023); and *Renewable Fuel Standard (RFS) Program: RFS Annual Rules* (87 FR 39600) (July 1, 2002).

[161] *Argus Leader,* 139 S. Ct. at 2366.

[162] *Id.* at 2363.

[163] *Id.* (internal citations omitted).

[164] *Id.* (internal citations omitted).

[165] ''Exemption 4 After the Supreme Court's Ruling in *Food Marketing Institute* v. *Argus Leader Media* and Accompanying Step-by-Step Guide,'' Office of Information Policy, U.S. DOJ, (October 4, 2019). Available at: *https://www.justice.gov/oip/exemption-4-after-supreme-courts-ruling-food-marketing-institute-v-argus-leader-media.*

[166] See *id.;* see also ''Step-by-Step Guide for Determining if Commercial or Financial Information Obtained from a Person is Confidential under Exemption 4 of the FOIA,'' Office of Information Policy, U.S. DOJ, (updated October 7, 2019). Available at: *https://www.justice.gov/oip/step-step-guide-determining-if-commercial-or-financial-information-obtained-person-confidential.*

Court's decision, and the subsequent DOJ guidance that the government's assurances that a submission will be treated as *not* confidential should dictate the expectations of submitters. Based on the finalized determinations, submitters are on notice before they submit any information that EPA has determined that the identified data elements outlined in Tables 2, 3, and 4 below, as well as in the memorandum provided in the docket for this action titled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule,* will not be entitled to confidential treatment upon submission and may be released by the Agency without further notice. As a result, submitters do not have a reasonable expectation that the information will be treated as confidential; rather, they have the reasonable expectation that the information will be disclosed.

As described further below, EPA is making categorical confidentiality determinations for some of the data that will be submitted to EPA because these data contain information that is not entitled to confidential treatment. The reason this information is not entitled to confidential treatment is that either it is not the type of information that submitters customarily keep private or closely held, it is already publicly available, or it is discernible information that is self-evident or readily observable through reverse engineering by a third party.

Comment: One commenter stated that EPA's requirements with respect to confidential data are responsible and appropriate. Another commenter recommended that EPA consider the scope, cost, and effort for the Agency to publish and maintain such information and that EPA consider modifying its publications to be on an annual or other basis if the burden of publication becomes too great to maintain.

Response: EPA acknowledges the general support for the proposal. The Agency did consider scope and cost for data collection in the information collection request (ICR) available in the docket of this final rulemaking. As noted above, the Agency is committed to data transparency and intends to maintain and publish (*e.g.,* post on EPA's website) with an appropriate frequency.

Comment: A few commenters discussed the proposed container tracking data elements. One commenter stated that EPA peremptorily proposed to find that certain categorical information is either "emission data" and should be treated as such pursuant to 40 CFR 2.301(a) or that this type of information does not qualify for confidential treatment under Exemption 4 of the FOIA. The commenter further stated that this would treat the covered information as releasable without further notification to the submitter. This commenter disagreed with these proposed determinations and with EPA's proposed conclusion that data elements associated with the proposed tracking system were not the type of information that is customarily closely held or kept private by companies. The commenter also disagreed with EPA's proposed conclusion that this information meets the regulatory definition of "emissions data" within 40 CFR 2.301(a)(2)(i). Another commenter supported the proposed rule's data collection requirements and encouraged EPA to expand the public availability of data on the composition and volumes of refrigerants on the U.S. market, including expanded transparency requirements for virgin producers in order to facilitate EOL fractionation and reclamation.

Response: EPA interprets the first comment to relate to the proposed confidentiality determinations for the data elements related to the container tracking requirements that were included in section V.C of the proposal. As discussed in section I.B, the Agency is not finalizing container tracking requirements at this time and thus is not making final determinations on the confidential treatment of those data elements in this rulemaking. Accordingly, the Agency need not respond to comments regarding the proposed confidentiality determinations for the container tracking system in this rulemaking. However, EPA notes that the commenter has presented only general objections to EPA's proposed determinations that these data elements were emissions data or did not qualify for confidential treatment, and the comment did not identify which particular data elements it views as entitled to confidential treatment or not qualifying as emissions data. The commenter also did not provide any information to support their assertions that the proposed determinations would result in the "disclosure of much information that is not public" [167] and that would result in harm; moreover, the commenter provided no substantiation to show that this information is customarily treated as confidential. This lack of specificity would impede EPA's effort to evaluate the commenter's concerns with respect to any particular data elements. Insofar as commenters disagree with proposed determinations that information is not entitled to confidential treatment, they should highlight the particular data element or elements where they disagree with the proposed determination and provide information regarding how that data element is customarily and actually treated by them and by their industry sector to support their assertions. Without such information, EPA is unable to fully assess the commenters' concerns, particularly when the data elements include information where EPA can discern no apparent reason for thinking that the information would typically be treated as confidential by the submitter (*e.g.,* information that is already publicly available or is not generally claimed as confidential by the industry sector). Further, the fact that only one commenter objected to the proposed determinations may indicate that the information is not customarily closely held or kept private.

EPA acknowledges the other commenter's support of the data collection requirements and availability of public data to extent that it is covered in this final rule. Data regarding production is outside the scope of this rule but may already be available at the HFC data hub.[168]

2. Emission Data Under Section 114 of the Clean Air Act

The AIM Act provides that, "[s]ections 113, 114, 304, and 307 of the CAA (42 U.S.C. 7413, 7414, 7604, 7607) shall apply to this section and any rule, rulemaking, or regulation promulgated by the Administrator pursuant to this section as though this section were expressly included in title VI of that Act (42 U.S.C. 7671 *et seq.*)." The CAA states that "[a]ny records, reports or information obtained under [section 114] shall be available to the public." [169] Thus, the CAA begins with a presumption that information submitted to EPA will be available to be disclosed to the public. It then provides a narrow exception to that presumption for information that "would divulge methods or processes entitled to protection as trade secrets." The CAA further narrows this exception by excluding "emission data" from the category of information eligible for confidential treatment. While the CAA does not define "emission data," EPA has done so by regulation at 40 CFR 2.301(a)(2)(i).

EPA releases, on occasion, some of the information submitted under CAA

[167] See comment number EPA–HQ–OAR–2022–0606–0085 at 25.

[168] Available at: *https://www.epa.gov/climate-hfcs-reduction/hfc-data-hub.*

[169] CAA section 114(c); 42 U.S.C. 7414(c).

section 114 to parties outside of the Agency of its own volition, through responses to requests submitted under the FOIA,[170] or through civil litigation. Generally, when the Agency has information that it intends to disclose publicly and that is covered by a claim of confidentiality under FOIA Exemption 4, EPA has a process to make case-by-case or class determinations under 40 CFR part 2. This process includes an evaluation of whether such information is or is not emission data, and whether it otherwise qualifies for confidential treatment under FOIA Exemption 4.[171] The regulations at 40 CFR 2.301 define emission data.

In this action, EPA is applying the regulatory definition of ''emission data'' in 40 CFR 2.301(a)(2)(i) and finding that certain categories of source information are not entitled to confidential treatment because they qualify as emission data. By finalizing these determinations, that information is subject to disclosure to the public without further notice. As relevant to the determinations that are being finalized in this action, a ''source'' for purposes of the definition in 40 CFR 2.301 is generally the equipment covered by a regulatory requirement, such as a refrigerant-containing appliance or fire suppression equipment. EPA's broad general definitions of emission data also exclude certain information related to products still in the research and development phase or products not yet on the market except for limited purposes. Thus, for example, 40 CFR 2.301(a)(2)(ii) excludes information related to ''any product, method, device, or installation (or any component thereof) designed and intended to be marketed or used commercially but not yet so marketed or used.'' This specific exclusion from the definition of emission data is limited in time. Data related to this exclusion are not implicated in this rulemaking because data reported under this rule relate to equipment currently in use.

B. Data Elements Reported to EPA Under the Leak Repair Provisions

Consistent with EPA's commitment to transparency in program implementation, EPA has reviewed the data elements in the chronically leaking appliance report and the other ad hoc reports required under the leak repair requirements to see if information under the umbrella of those data elements could be considered entitled to confidential treatment. EPA is treating certain data elements under the leak repair provisions as not entitled to confidential treatment. Tables 2 and 3 outline individual data elements that will not be handled as confidential, emission data, or otherwise not entitled to confidential treatment. Additional information on these determinations is provided in the memorandum titled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule,* which is available in the docket for this action. There may be additional reasons not to release individual data elements determined to not be entitled to confidential treatment, for example if it is personally identifiable information (PII). The Agency will separately determine whether any data should be withheld from release for reasons other than business confidentiality before data are released.

TABLE 2—DETERMINATION OF CONFIDENTIALITY STATUS FOR DATA ELEMENTS RELATED TO REPORTS ON CHRONICALLY LEAKING APPLIANCES

Description of data element	Confidentiality status and rationale[a]
Identification information (owner or operator, facility name, facility address where appliance is located).	No confidential treatment/Emission data.
Appliance ID or description (for facilities with multiple appliances)	No confidential treatment/Emission data.
Refrigerant-containing appliance type (comfort cooling or other, IPR, or commercial refrigeration).	No confidential treatment/Emission data.
Refrigerant type	No confidential treatment/Emission data.
Full charge of appliance (pounds)	No confidential treatment/Emission data.
Annual percent refrigerant loss	No confidential treatment/Emission data.
Dates of refrigerant addition	No confidential treatment/Emission data.
Amounts of refrigerant added	No confidential treatment/Emission data.
Date of last successful follow-up verification test	No confidential treatment/Emission data.
Explanation of cause of refrigerant losses (Narrative)	No confidential treatment/Emission data.
Description of the repair actions taken (Narrative)	No confidential treatment/Emission data.
Whether a retrofit or retirement plan has been developed for the appliance, and, if so, the anticipated date of retrofit or retirement.	No confidential treatment/Emission data.

[a] EPA provides rationale of the confidentiality determination in the memorandum titled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule entitled ''Phasedown of Hydrofluorocarbons: Management of Certain Hydrofluorocarbons and Substitutes under Subsection (h) of the American Innovation and Manufacturing Act of 2020'',* which is available in the docket (EPA–HQ–OAR–2022–0606) of this rulemaking at *https://www.regulations.gov.*

TABLE 3—DETERMINATION OF CONFIDENTIALITY STATUS FOR DATA ELEMENTS RELATED TO OTHER LEAK REPAIR NOTIFICATIONS AND EXTENSION REQUESTS

Description of data element	Confidentiality status and rationale[a]
Extension of time to complete repairs: Identification and address of the facility; the name of the owner or operator of the refrigerant-containing appliance; the leak rate; the method used to determine the leak rate and full charge; the date the refrigerant-containing appliance exceeded the applicable leak rate; the location of leak(s) to the extent determined to date; any repairs that have been performed thus far, including the date that repairs were completed; the reasons why more than 30 days (or 120 days if an industrial process shutdown is required) are needed to complete the repairs; and an estimate of when the repairs will be completed. If the estimated completion date is to be extended, a new estimated date of completion and documentation of the reason for that change must be submitted to EPA within 30 days of identifying that the completion date must be extended.	No confidential treatment/Emission data.

[170] 5 U.S.C. 552.

[171] 40 CFR 2.301(a)(2)(i).

TABLE 3—DETERMINATION OF CONFIDENTIALITY STATUS FOR DATA ELEMENTS RELATED TO OTHER LEAK REPAIR NOTIFICATIONS AND EXTENSION REQUESTS—Continued

Description of data element	Confidentiality status and rationale[a]
Relief from the obligation to retrofit or retire a refrigerant-containing appliance: The date that the requirement to develop a retrofit or retirement plan was triggered; the leak rate; the method used to determine the leak rate and full charge; the location of the leak(s) identified in the leak inspection; a description of repair work that has been completed; a description of the repairs that have not been completed; a description of why repairs were not conducted within the applicable time frame; and a statement signed by an authorized company official that all identified leaks will be repaired and an estimate of when those repairs will be completed (not to exceed one year from date of the plan).	No confidential treatment/Emission data.
Extension of time to complete the retrofit or retirement of a refrigerant-containing appliance: Identification of the refrigerant-containing appliance; name of the owner or operator; the leak rate; the method used to determine the leak rate and full charge; the date the refrigerant-containing appliance exceeded the applicable leak rate; the location of leak(s) to the extent determined to date; any repairs that have been finished thus far, including the date that repairs were finished; a plan to finish the retrofit or retirement of the refrigerant-containing appliance; the reasons why more than one year is necessary to retrofit or retire the refrigerant-containing appliance; the date of notification to EPA; and an estimate of when retrofit or retirement work will be finished.	No confidential treatment/Emission data.
Notification of exclusion of purged refrigerants that are destroyed from annual leak rate calculations: The identification of the facility and a contact person, including the address and telephone number; a description of the refrigerant-containing appliance, focusing on aspects relevant to the purging of refrigerant and subsequent destruction; a description of the methods used to determine the quantity of refrigerant sent for destruction and type of records that are being kept by the owners or operators where the appliance is located; the frequency of monitoring and data-recording; and a description of the control device, and its destruction efficiency.	No confidential treatment/Emission data.

[a] EPA provides the rationale for the confidentiality determination in the memorandum titled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule entitled "Phasedown of Hydrofluorocarbons: Management of Certain Hydrofluorocarbons and Substitutes under Subsection (h) of the American Innovation and Manufacturing Act of 2020"*, which is available in the docket (EPA–HQ–OAR–2022–0606) of this rulemaking at *https://www.regulations.gov.*

Information contained within these data elements would categorically not be eligible for confidential treatment because it is either readily apparent or easily ascertainable by an outsider (*e.g.,* owner name, facility name, facility address where appliance is located, appliance ID or description, and appliance type (comfort cooling, IPR, or commercial refrigeration)) or it is considered emission data under 40 CFR 2.301 (*e.g.,* refrigerant type, full charge of appliance, annual percent refrigerant loss, dates of refrigerant addition, amounts of refrigerant added, date of last successful follow-up verification test, explanation of cause of refrigerant losses, repair actions taken, and whether a retrofit or retirement plan been developed for the appliance, and, if so, the anticipated date of retrofit or retirement); or it fits into both categories. Similarly, the items included in a request for an extension for leak repair, request for relief from the obligation to retrofit or retire an appliance, request for an extension of time to complete the retrofit or retirement of an appliance, and notification of exclusion of purged refrigerants that are destroyed from annual leak rate calculations are likewise not eligible for confidential treatment because this information is readily ascertainable or easily observable by an outside entity, or is considered emission data under 40 CFR 2.301, or both. EPA notes that in these provisions, the source of the emissions would be the regulated equipment, and in the case of all of these notifications these data are necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of any emission that has been emitted by the source and/or information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of the emissions which, under the leak repair provisions, the source was authorized to emit; and a general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources (including, to the extent necessary for such purposes, a description of the device, installation, or operation constituting the source).

C. Data Elements Related to Fire Suppression

As described in section IV.F of this document, EPA is finalizing reporting requirements related to the use of regulated substances in the fire suppression sector. These reporting requirements allow for the monitoring of program implementation and of compliance with the requirements.

EPA is requiring that certain entities in the fire suppression sector provide data to EPA that are similar to the data they already voluntarily collect and report to HEEP as mentioned in section IV.F. Relevant reporting entities covered under this requirement include entities that perform first fill of equipment, service (*e.g.,* recharge) equipment, and/or recycle regulated substances. Relevant entities include companies, such as equipment manufacturers, distributors, agent suppliers, or installers. EPA is finalizing that the covered entities report annually: (1) The quantity of each regulated substance held in inventory on-site broken out by recovered, recycled, and virgin; (2) the quantity of material (the combined mass of regulated substance and contaminants) by regulated substance sold and/or recycled for the purpose of installation of new equipment and servicing (*e.g.,* recharge) of fire suppression equipment; (3) the total mass of each regulated substance sold and/or recycled; and (4) the total mass of waste products sent for disposal, along with information about the disposal facility if waste is not processed by the reporting entity. Table 4 presents a more granular description of these data elements, together with their confidentiality status. There may be additional reasons not to release individual data elements determined to not be entitled to confidential treatment, for example if they are PII. The Agency will separately determine whether any data should be withheld from release for reasons other than business confidentiality before data are released.

EPA has determined that these data are emission data as described at 40 CFR 2.301 because they provide a general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources. As a separate alternative basis, EPA has determined that these data are not entitled to confidential treatment because they are not closely held as confidential by the submitter. Additional information on the rationale for these determinations is provided in a memorandum entitled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule,* available in the docket for this action.

TABLE 4—DETERMINATION OF CONFIDENTIALITY STATUS FOR DATA ELEMENTS RELATED TO REPORTS ON FIRE SUPPRESSION

Description of data element	Confidentiality status and rationale [a]
Identification information (owner name, facility name, facility address where equipment is located)	No confidential treatment/Emission data.
For each regulated substance, quantity of material (the combined mass of regulated substance and contaminants) sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment.	No confidential treatment/Emission data.
For each regulated substance, quantity of material (the combined mass of regulated substance and contaminants) in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin.	No confidential treatment/Emission data.
Total mass of each regulated substance sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment.	No confidential treatment/Emission data.
Total mass of each regulated substance in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin.	No confidential treatment/Emission data.
Total mass of waste products the reporting entity sent for disposal, along with information about the disposal facility if waste is not processed by the reporting entity.	No confidential treatment/Emission data.

[a] EPA provides rationale of the confidentiality determination in the memorandum titled *Confidentiality Determinations and Emission Data Designations for Data Elements in the Final Rule entitled "Phasedown of Hydrofluorocarbons: Management of Certain Hydrofluorocarbons and Substitutes under Subsection (h) of the American Innovation and Manufacturing Act of 2020",* which is available in the docket (EPA–HQ–OAR–2022–0606) of this rulemaking at *https://www.regulations.gov.*

VI. What are the costs and benefits of this action?

A. Background

EPA is providing information on the costs and benefits for the provisions related to managing regulated substances and their substitutes in this rule. The analyses, presented in the Economic Impact and Benefits TSD and the RIA addendum, are contained in the docket to this rule and are intended to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders. The RIA addendum includes estimates of the SC–HFCs in order to quantify climate benefits, for the purpose of providing useful information to the public and to comply with E.O. 12866. Although EPA is using the SC of HFCs for purposes of that assessment, this action does not rely on those estimates as a record basis for the Agency action, and EPA would reach the conclusions made in this final rule even in the absence of the social costs of HFCs.

The climate benefits and compliance costs stemming from this final rule include those related to:

(1) the provisions on leak repair, leak detection, ALD systems, and recordkeeping and reporting related to these provisions;

(2) the amendments to the RCRA hazardous waste regulations;

(3) requirements regarding the management of disposable cylinders for HFCs;

(4) requiring the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs, along with recordkeeping requirements verifying that reclaimed refrigerant contains no more than 15 percent, by weight, virgin HFCs; and

(5) minimizing emissions of HFCs from certain types of fire suppression equipment including the service, repair, or initial charging of such equipment with recycled HFCs.

As detailed in the RIA addendum, EPA finds that in some cases specific provisions of the rule would result in compliance costs for industry, while in other cases they may result in cost savings. Provisions that result in a net cost savings may still be considered part of the economic benefits attributable to this rule, under the assumption that these activities would not otherwise be undertaken at the same scale or rate of adoption in the absence of regulation. More discussion of these assumptions and supporting literature may be found in section 3.2.2 of the Allocation Framework Rule RIA.

From the Agency's analyses, EPA provides the costs and benefits associated with the management of regulated substances and their substitutes under the AIM Act as well as those associated with the RCRA alternative standard requirements for hazardous waste. These analyses—as summarized below—highlight economic cost and benefits, including benefits from leak repair and emissions reductions.

Given that the provisions EPA is finalizing concern HFCs, which are subject to the overall phasedown of production and consumption under the AIM Act, EPA relied on its previous estimates of the impacts of already finalized AIM Act rules as a starting point for the assessment of costs and benefits of this rule. Specifically, the Allocation Framework Rule (86 FR 55116, October 5, 2021), the 2024 Allocation Rule (88 FR 46836, July 20, 2023), and the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023) are assumed as a baseline for this rule. In this way, EPA analyzed the incremental impacts of this rule, attributing benefits only insofar as they are additional to those already assessed in the Allocation Framework Rule RIA, the 2024 Allocation Rule RIA Addendum, and the 2023 Technology Transitions Rule RIA Addendum (collectively referred to as "Allocation and 2023 Technology Transitions Rules" in this discussion). Climate benefits presented in the RIA addendum are based on changes (increases or reductions) in HFC emissions compared to the 2023 Technology Transitions Rule

compliance case [172] (*i.e.,* after consideration of the Allocation Framework Rule, the 2024 Allocation Rule, and the 2023 Technology Transitions Rule).

EPA estimated the climate benefits for this rule using a set of estimates of the social cost of each HFC (SC–HFC, or collectively referred to as SC–HFCs) that is affected by the rule. The SC–HFCs is the monetary value of the net harm to society associated with a marginal increase in HFC emissions in a given year, or the net benefit of avoiding that increase. In principle, the SC–HFC includes the value of all climate change impacts (both negative and positive), including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk and natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services. The SC–HFC, therefore, reflects the societal value of reducing emissions of the gas in question by one metric ton and is the appropriate value to use in conducting benefit-cost analyses of policies that affect HFC emissions. In practice, data and modeling limitations restrain the ability of SC–HFC estimates to include all physical, ecological, and economic impacts of climate change, implicitly assigning a value of zero to the omitted climate damages. The estimates are, therefore, a partial accounting of climate change impacts and likely underestimate the marginal benefits of abatement.

The monetization of climate benefits in this analysis uses the same HFC-specific SC–HFC estimates as used in the proposal RIA and in the estimation of the benefits in prior AIM Act analyses including the Allocation Framework Rule RIA. That is, for the primary benefits analysis in the final RIA addendum, EPA uses SC–HFC estimates that are consistent with the methodology underlying estimates of the social cost of other GHGs (carbon dioxide (SC–CO_2), methane (SC–CH_4), and nitrous oxide (SC–N_2O)), collectively referred to as SC–GHG, presented in the *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under* Executive Order 13990 published in February 2021 by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG).[173] These SC–GHG estimates were recommended for use until updated estimates are available that reflect recent advances in the scientific literature on climate change and its economic impacts and incorporate recommendations made by the National Academies of Science, Engineering, and Medicine.[174] As a member of the IWG involved in the development of the February 2021 SC–GHG TSD, EPA agrees with the explanation in the TSD that it is appropriate for agencies to use the same set of four values drawn from the SC–GHG distributions based on three discount rates as were used in regulatory analyses between 2010 and 2016 and subject to public comment (2.5 percent, three percent, and five percent), plus a fourth value, selected as the 95th percentile of estimates based on a three percent discount rate. EPA also agrees with the explanation provided in the February 2021 TSD that the use of the social rate of return on capital (seven percent under the 2003 Office of Management and Budget (OMB) Circular A–4 guidance) to discount the future benefits of reducing GHG emissions inappropriately underestimates the impacts of climate change for the purposes of estimating the social cost of GHGs. For purposes of capturing uncertainty around the SC–HFC estimates applied in this analysis, we emphasize the importance of all four values for each HFC affected by the rule.

In addition, in an Appendix to the final RIA addendum, EPA presents the monetized climate benefits of the final rule using a new set of SC–HFC estimates that reflects recent advances in the scientific literature and addresses the National Academies' updating recommendations. The methodology underlying these updated SC–HFC estimates is consistent with the SC–GHG estimates used in EPA's 2023 RIA for the Final Oil and Gas New Source Performance Standards (NSPS)/Emissions Guidelines (EG) Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review." Specifically, the draft updated methodology incorporates new literature and research consistent with the National Academies' near-term recommendations on socioeconomic and emissions inputs, climate modeling components, discounting approaches, and treatment of uncertainty, and an enhanced representation of how physical impacts of climate change translate to economic damages in the modeling framework based on the best and readily adaptable damage functions available in the peer reviewed literature. As EPA noted in the proposal for this rule, EPA presented and solicited public comment on this updated methodology within a sensitivity analysis in the regulatory impact analysis of EPA's November 2022 supplemental proposal for oil and natural gas emissions standards.[175] EPA also conducted an external peer review of the accompanying technical report that explains the methodology underlying the new set of estimates. Complete information about the public comments and external peer review, including the peer reviewer selection process, the final report with individual recommendations from peer reviewers, and EPA's response to both public comments and peer reviewer recommendations is available on EPA's website,[176] as well as in the RIA addendum for this rule.

B. Estimated Costs and Benefits of the Final Rule

1. Total Incremental Costs and Benefits of the Final Rule

As discussed above, the HFC Allocation and 2023 Technology Transitions Rules serve as the status quo from which incremental impacts of this final rule are evaluated. As detailed in the RIA and subsequent RIA addenda for these previous rules, EPA modeled multiple potential compliance pathways to meeting the requirements of these rulemakings. In one scenario, EPA assumed that industry would comply with previous AIM Act regulations as outlined in the 2023 Technology Transitions Rule RIA Addendum [177] without undertaking some improvements to leak repair and refrigerant recovery practices in

[172] As detailed in the 2023 Technology Transitions RIA Addendum, EPA analyzed both a base case and high additionality scenario towards compliance with that rule. The discussion here utilizes the 2023 Technology Transitions high additionality case for comparison purposes to provide a conservative assessment. Further details are provided in the RIA addendum for this rule and the Economic Impact and Benefits TSD.

[173] Interagency Working Group on Social Cost of Greenhouse Gases, United States Government (IWG 2021), 86FR 24669, available at *https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf.*

[174] National Academies of Sciences, Engineering, and Medicine. Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide. The National Academies Press, 2017, doi: 10.17226/24651.

[175] Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (87 FR 74702, December 6, 2022).

[176] Available at: *https://www.epa.gov/environmental-economics/scghg.*

[177] In the 2023 Technology Transitions RIA Addendum, EPA analyzed a "base case" and a "high additionality" scenario. The former is used to analyze the base case scenario for this rule. See the RIA addendum and the Economic Impact and Benefits TSD for additional details.

response to these previous rulemakings and as a means of achieving the overall HFC phasedown cap. Because these improvements are not required to meet previous AIM Act regulations, in the Agency's base case scenario for the estimated incremental impacts of the ER&R rule, EPA has also included them in the baseline. However, since whether industry undertakes such improvements is ultimately uncertain, EPA has also provided an alternative scenario in the RIA addendum where some improved leak repair and refrigerant recovery practices are included in the baseline, thus illustrating a potential lower bound of incremental impacts.

The present value of the net benefits of the final ER&R rule is equal to the sum of the net costs or benefits of the various provisions in each year from 2026 through 2050, discounted to 2024 (the year in which this rule is being finalized). In the base case, EPA estimates the provisions of this rule will result in cumulative incremental emissions reductions of approximately 120 $MMTCO_2e$ from 2026 through 2050, and the present value of economic benefits of avoiding the damages associated with those emissions is estimated at $8.4 billion (discounted to 2024 using a three percent discount rate).[178] EPA estimates the present value of compliance costs associated with this rulemaking to be $1.5 billion at a two percent discount rate, $1.3 billion at a three percent discount rate, or $0.9 billion at a seven percent discount rate. When including the economic benefits of avoided climate damages, the net benefits of the rule are therefore estimated to range from $6.9 billion (two percent discount rate for compliance costs) to $7.5 billion (seven percent discount rate for compliance costs). These estimates are summarized in Table 5 below along with annual, undiscounted values for select years.

TABLE 5—SUMMARY OF UNDISCOUNTED ANNUAL VALUES, PRESENT VALUES, AND EQUIVALENT ANNUALIZED VALUES SELECT YEARS FOR THE 2026 THROUGH 2050 TIMEFRAME FOR ESTIMATED COMPLIANCE COSTS, BENEFITS, AND NET BENEFITS FOR THE ER&R RULE (MILLIONS OF 2022$, DISCOUNTED TO 2024)—BASE CASE SCENARIO [a b c d e f g]

Year	Climate benefits	Costs			Net benefits		
2026	$428	$92			$336		
2030	676	102			574		
2035	613	86			526		
2040	466	67			399		
2045	315	51			264		
2050	263	52			211		
Discount rate	3%	2%	3%	7%	2%	3%	7%
Present value [f]	$8,356	$1,499	$1,335	$884	$6,857	$7,021	$7,471
Equivalent annualized value (EAV) [f]	480	77	77	76	403	403	404

[a] Benefits include only those related to climate. Climate benefits are based on changes (reductions) in HFC emissions and are calculated using four different estimates of the social cost of HFCs (SC–HFCs): model average at 2.5 percent, three percent, and five percent discount rates; 95th percentile at three percent discount rate. For presentational purposes of this table, the benefits associated with the average SC–HFC are shown at a three percent discount rate. More details can be found in the RIA addendum for the final rule.

[b] Rows may not appear to add correctly due to rounding.

[c] The annualized present value of costs and benefits are calculated as if they occur over a 25-year period.

[d] The present value (PV) for the net benefits column is found by taking the difference between the PV of climate benefits at three percent and the PV of costs discounted at seven percent, three percent or two percent. Because the SC–HFC estimates reflect net climate change damages in terms of reduced consumption (or monetary consumption equivalents), the use of the social rate of return on capital (seven percent under OMB Circular A–4 (2003)) to discount damages estimated in terms of reduced consumption would inappropriately underestimate the impacts of climate change for the purposes of estimating the SC–HFC.

[e] Costs represent compliance with the regulations and include potential savings from reducing refrigerant purchases. See the RIA addendum and the Economic Impact and Benefits TSD for additional information.

[f] Present value and EAV are for the years 2026 through 2050.

[g] Benefits presented in this table do not include potential savings from amended RCRA regulations, which are separate from the regulations under subsection (h)(1) of the AIM Act. See Table 6 below for an estimate of combined AIM Act and RCRA net benefits.

The provisions that contribute to the total net benefits of the final rule are those covering leak inspections, leak repair, installation of ALD systems, reduced emissions and use of recycled HFCs in the fire suppression sector, management and ultimate evacuation of disposable cylinders, and the required servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs, and all associated recordkeeping and reporting requirements. Estimated costs, benefits, and resulting net benefits are provided by type of provision in Table 6 below.

TABLE 6—SUMMARY OF PRESENT VALUE COSTS, BENEFITS, AND NET BENEFITS BY REGULATORY PROVISION (MILLIONS OF 2022$, DISCOUNTED TO 2024)—BASE CASE SCENARIO

Provision	Climate benefits (3%)	Costs (savings) (2%)	Costs (savings) (3%)	Costs (savings) (7%)	Net benefits (3% benefits, 2% costs)	Net benefits (3% benefits, 3% costs)	Net benefits (3% benefits, 7% costs)
Leak Repair And ALD	$6,176	$1,285	$1,146	$760	$4,891	$5,031	$5,417.
Fire Suppression	14	$15	$13	$7	($1)	$1	$7.
Cylinder Management	2,165	($195)	($169)	($101)	$2,360	$2,335	$2,266.
Use of Reclaimed HFCs for Servicing [a].		$43	$38	$23	($43)	($38)	($23).
Recordkeeping & Reporting		$350	$308	$195	($350)	($308)	($195).
Total (AIM Act) [b]	8,356	$1,499	$1,335	$884	$6,857	$7,021	$7,471.

[178] Unless stated otherwise, costs and benefits in this section are presented in 2022 dollars.

TABLE 6—SUMMARY OF PRESENT VALUE COSTS, BENEFITS, AND NET BENEFITS BY REGULATORY PROVISION (MILLIONS OF 2022$, DISCOUNTED TO 2024)—BASE CASE SCENARIO—Continued

Provision	Climate benefits (3%)	Costs (savings) (2%)	Costs (savings) (3%)	Costs (savings) (7%)	Net benefits (3% benefits, 2% costs)	Net benefits (3% benefits, 3% costs)	Net benefits (3% benefits, 7% costs)
RCRA Alternative Standard Requirements [c].	.....	$0 to ($40)	$0 to ($35)	$0 to ($22)	$0 to $40	$0 to $35	$0 to $22.
Total (AIM Act + RCRA) [b]	.....	$1,459 to $1,499	$1,300 to $1,335	$863 to $884	$6,857 to $6,897	$7,021 to $7,056	$7,471 to $7,493.

[a] As detailed in the RIA addendum, reclaim requirements may lead to additional emissions reductions by inducing increased recovery of refrigerant at servicing and disposal that may otherwise be released or vented. In the base case scenario, EPA does not estimate an increase in these avoided emissions beyond baseline assumptions. See the RIA addendum for additional analysis related to this assumption.
[b] Rows may not appear to add correctly due to rounding.
[c] RCRA alternative standard requirements are part of the RCRA regulations, which are separate from the regulations under subsection (h)(1) of the AIM Act. Potential RCRA-related benefits presented in this table are included here for informational purposes.

2. Estimating Costs and Benefits Based on Affected Equipment and Appliances

As detailed in the RIA addendum, the number, charge sizes, leak rates, and other characteristics of affected RACHP and fire suppression equipment, and the benefits realized through the requirements of this rulemaking, were estimated using EPA's Vintaging Model.[179] For example, for RACHP equipment covered by the rule's leak repair and ALD system provisions, the requirements are assumed to lead to leaking systems being repaired earlier than they otherwise would have been, leading to reduced emissions of HFCs. The reduction in HFC emissions results in climate benefits due to reduced climate forcing as calculated by multiplying avoided emissions by the social cost of each SC–HFC.

In the years 2026 through 2050, the final rule's leak repair and ALD system provisions in particular would prevent an estimated 88.5 $MMTCO_2e$ in HFC emissions, and the present value of the economic benefit of avoiding the damages associated with those emissions is estimated at $6.2 billion (in 2022 dollars, discounted to 2024 using a three percent discount rate). These benefits, as well as those resulting from other provisions contained in the final ER&R rule, are estimated to decrease over time due to the HFC phasedown and the transition out of the higher-GWP HFCs, lowering the average GWP of avoided future emissions. For example, it is estimated that the leak repair and ALD system provisions would prevent approximately 5.6 $MMTCO_2e$ of HFC emissions in 2030, which decreases to approximately 3 $MMTCO_2e$ of HFC emissions in 2040.

Some provisions contained in the final rule are also estimated to yield cost savings.[180] For example, reducing HFC emissions due to fixing leaks earlier would also be anticipated to lead to savings for system owner/operators, as less new refrigerant would need to be purchased to replace leaked refrigerant. In 2026, it is estimated that the proposed leak repair and ALD system provisions would lead to savings of approximately $19.5 million (in 2022 dollars).

The compliance costs of the leak repair and inspection requirements in particular include the costs of purchasing and operating ALD systems, costs of required inspections, and the costs of repairing leaks earlier than would have been necessary without the provisions. When combined with the refrigerant savings, in the years 2026 through 2050, these provisions would result in net compliance costs with a present value estimated at $1.15 billion (2022 dollars, discounted to 2024 at a three percent discount rate). More details on underlying assumptions for these estimates can be found in the RIA addendum for the final rule and its accompanying appendices.

Comment: One commenter stated that the regulations put in place by EPA will provide health benefits to technicians and their consumers. The commenter also stated that there will be environmental benefits since the HFC Phasedown Program encourages recycling HFCs to reduce GHG production rates.

The commenter also noted that for this transition, States are providing incentive programs to help companies adjust to the new standards proposed by EPA. The commenter mentioned that California and Delaware have programs to increase the use of low-GWP refrigerants. The commenter stated that this is a great way to show support for the proposed rule because it is evident that businesses will lose a significant portion of funding with the transition to eco-friendly refrigerants.

The commenter further stated that they wished the proposed rule had more data on the environmental and health impacts of not switching to more eco-friendly HFCs instead of "briefly" discussing it.

Response: EPA acknowledges the commenter's support for this rule. EPA's modeling for this rule focused on how the rule would impact GHG emissions and the HFC marketplace. The Agency acknowledges the comments on the environmental benefits of the HFC Phasedown Program and moreover the global HFC phasedown under the Montreal Protocol's Kigali Amendment but notes that this is outside the scope for this rulemaking, as EPA did not propose to revise regulations to phase down HFCs in this rulemaking. In response to comments on State HFC-management programs, EPA acknowledges the presence of state-level HFC management programs and has referenced some of those programs at various points in this rulemaking, for informational purposes and additional context. For example, EPA cited CARB's refrigerant management program when discussing charge-size thresholds for ALD systems in section IV.D.1. EPA further notes that requirements and incentives of such State programs are also outside the scope of this rulemaking, as those are developed and implemented by State regulators rather than EPA.

Comment: One commenter stated that the costs in EPA's costs and benefits analysis for entering records is grossly underestimated, and a more accurate estimate would be 10 minutes. The commenter asserted that the 10-minute

[179] EPA. 2024. EPA's Vintaging Model representing the Allocation Framework Rule as modified by the 2024 Allocation Rule RIA Addendum. VM IO file_v4.4_02.04.16_Final TT Rule 2023 High Addition.xls.

[180] As discussed in section I.C. of this preamble, the RIA addendum for this rule assumes that in some cases cost savings may accrue to industry as a result of regulatory measures. In some cases, measures are assumed to result in a net cost to regulated entities, while in other cases, measures are assumed to result in a net savings. More details on these assumptions are included in the RIA addendum. For additional discussion on market failures that may lead to forgone savings to industry in the absence of regulatory measures, please see section I.C. of this preamble as well as section 3.2.2 of the Allocation Rule RIA.

estimate includes the assumption that the service contractor is recording entries correctly the first time and the record-keeping software loads immediately. The commenter additionally stated that due to the number of small appliances that will be added to the recordkeeping burden, recordkeeping burden will increase by 50 to 100 percent.

Response: EPA notes that the commenter is not specific in regard to which particular record entry cost assumption they claim is an underestimate. EPA has included estimated recordkeeping and reporting costs as a part of total estimated compliance costs in the RIA addendum. These estimates include cost burden assumptions derived from the ICR (EPA ICR Number 2778.01, *https://www.regulations.gov/document/EPA-HQ-OAR-2022-0606-0025*), which estimated labor hours ranging from minutes to up to 40 hours per requirement, depending on the specific recordkeeping or reporting requirement. EPA has not received specific data or information indicating that any of these assumptions need to be revised upward in any particular case, and the comment does not provide any information or data to support the assertion that 10 minutes would be a more accurate assumption for the estimate with which they disagree with. Nonetheless, based on the provisions EPA is finalizing in this rule, the Agency has adjusted the ICR for the final rule accordingly (EPA ICR Number 2778.02), available in the docket for this rulemaking. Regarding the recordkeeping burden for small appliances, EPA acknowledges that the inclusion of refrigerant-containing appliances with charge sizes of 15 pounds or more for the leak repair provisions in this rulemaking may increase recordkeeping burden compared to the recordkeeping burden if the ER&R regulations were to only cover equipment with charge sizes of 50 pounds or more. EPA's rationale for the 15-pound charge size is discussed in section IV.C.2 of the preamble.

Comment: Another commenter expressed concern that if finalized in its current form, the proposed rule would place significant and disproportionate burdens on the grocery industry and other retailers, and that new compliance and administrative burdens created by the proposed rule would lead to increased costs of doing business, which would ultimately be passed on to consumers. The commenter stated that the proposed new requirements would have significant costs that are not accounted for in the Economic Impact and Benefits TSD or in the RIA addendum to the Allocation Framework Rule RIA. The commenter noted several drivers of compliance costs:

- Tight compliance timeframes that will necessitate allocation of personnel and financial resources.
- Increased demand for and limited supply of reclaimed and/or recycled HFCs.
- Increased demand for and limited supply of ALD systems.
- The installation, training, and maintenance costs associated with ALD installation.
- The need to re-train technicians and maintenance personnel.
- Required retrofit or retirement of appliances with leaks that cannot be repaired in accordance with the proposed repair standard.

The commenter further stated that the Technology Transitions regulatory program will place a significant strain on supply chains and technicians, driving up costs, and that EPA's proposal to impose additional sweeping, mandatory system repair requirements in the near future will further drive a surge in demand for technicians, equipment, and refrigerants. The commenter added that the proposed new requirements, and their varying compliance timeframes, applicability thresholds, recordkeeping, and reporting requirements, will introduce administrative complexity, and that this additional burden is particularly pronounced for the commenter's members which are managing compliance for different sites in multiple States, each with different types of regulated appliances.

The commenter further asserted that the requirements in the proposed rule were unnecessary and would add significant regulatory burdens for little practical gain. The commenter suggested that as the phasedown will create a limited supply of HFCs in future years, businesses will already be well-incentivized to conduct repairs, minimize leaks, and use reclaimed HFCs, meaning that the regulatory mandates proposed are unnecessary. The commenter claimed that the costs and administrative burdens associated with the proposed rule are not justified for equipment that will be obsolete by the end of the HFC phasedown mandated in the AIM Act.

Response: Congress directed the Agency in subsection (h)(1) of the AIM Act to promulgate certain regulations, and that the authority conveyed under subsection (h) is separate from, but in addition to, authority Congress conveyed under other provisions of the Act. EPA is establishing the ER&R program to implement subsection (h), consistent with the directive given by Congress. Further, as discussed in greater detail throughout this preamble, this rulemaking is designed to serve the purposes identified in subsection (h)(1) of the AIM Act of maximizing reclamation, minimizing the release of regulated substances from equipment, and ensuring the safety of technicians and consumers. EPA did not propose and is not making any changes to the 2023 Technology Transitions Rule; comments with respect to the costs of that rule are out of scope for this rule and require no further response. However, EPA notes that the updated analysis of the costs of the ER&R Rule incorporated the effects of the 2023 Technology Transitions Rule as the baseline from which incremental costs and benefits were estimated.

While EPA has included estimates of the costs and benefits of this rulemaking in the RIA addendum (and reevaluated the costs and benefits of the final rule under two principal scenarios and provided sensitivity analyses around these estimates), to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, that analysis does not form a basis or rationale for any of the provisions promulgated in this rulemaking. To the extent that EPA has considered the results of analyses of the impacts of the provisions of the ER&R program in this rulemaking, those results are reflected in the Economic Impact and Benefits TSD. Further, while certain provisions of the AIM Act do expressly mention the consideration of certain costs, such as subsections (i)(4)(B) and (i)(4)(C), in this rulemaking, the Agency is neither addressing those provisions nor reopening regulations already promulgated under that separate authority. Nothing in the AIM Act requires EPA to consider costs or identify any particular cost-based metric or analytical approach for use in evaluating and establishing regulations to implement subsection (h). Subsection (h)(1) does, however, identify particular purposes that the regulations promulgated under that subsection are to serve, and EPA has focused on serving those purposes in adopting the requirements in this rulemaking. EPA further responds that many of the potential drivers of compliance costs cited by the commenter are uncertain; however, EPA has nonetheless endeavored to include such drivers in its assessment of compliance costs to the extent practicable and based on best available data as detailed in the Economic Impact and Benefits TSD. For

example, regarding costs associated with ALD systems, as noted in the RIA addendum, EPA has included the capital expenditure to purchase the hardware (*e.g.,* detector, sensors), plus installation costs and operations and maintenance costs associated with annual system maintenance, certification, and data tracking/storage. EPA has also included potential costs associated with retrofit or retirement of equipment with leaks that cannot be repaired, as detailed in the RIA addendum and Economic Impact and Benefits TSD. Finally, regarding the need to re-train technicians and personnel, EPA has included labor costs associated with ALD, leak inspection and repair, cylinder management, and fire suppression activities required by this rule. EPA acknowledges that regular training is an integral part of the job requirements of affected technicians and personnel. The comments did not provide, and EPA is not aware of, data indicating that training requirements contained in this rule would translate into increased labor hours or labor rate assumptions beyond those already included in the analysis contained in the RIA addendum and Economic Impact and Benefits TSD.

Regarding compliance timeframes, EPA notes that for many of the provisions contained in the final rule they have been extended relative to those contained in the proposed rulemaking, which has the effect of partially mitigating potential fast cash outlays related to compliance deadlines, allowing such costs to be spread over additional time, and allowing additional time for identifying suppliers, obtaining equipment, adjusting supply chains, or acquiring technicians and other personnel training as needed, as well as other steps that are necessary for compliance.

Regarding supply of reclaimed HFCs, EPA has provided data based on results from its Vintaging Model in both the proposed and final rule RIA addendum on the amount of reclaimed refrigerant that would be required to meet the requirements of the rule. EPA notes that this amount is significantly lower in the final rule, principally because the Agency is not finalizing, at this time, requirements for the initial charge of refrigerant-containing equipment with reclaimed HFCs and also because EPA is not finalizing, at this time, the servicing and/or repair of refrigerant-containing equipment in one of the four proposed RACHP subsectors. Although EPA responds to one comment providing analysis on supply of reclaimed refrigerants in section IV.E.1, this commenter did not provide data to EPA indicating that there would be a shortfall in supply of reclaimed refrigerant, nor does EPA anticipate such a shortfall based on estimated supply and demand of refrigerant using the Vintaging Model. For more information regarding supply of reclaimed HFCs, see responses to comments in section IV.E.1 and IV.E.2.

Regarding supply of ALD systems, EPA has extended the compliance deadline for the installation and use of ALD systems for both new and existing IPR and commercial refrigeration appliances above 1,500 pounds. EPA has also narrowed the scope of affected existing IPR and commercial refrigeration refrigerant-containing appliances to such appliances that were installed after January 1, 2017. This will ensure that there is an adequate supply of ALD systems for entities affected by the ALD installation and use requirements in this final rule. Further discussion on the supply of ALD systems can be found in section IV.D.1.

Although the 2023 Technology Transitions Rule is not addressed or reopened in this final rule, as the commenter claimed, provisions of that rule may lead retailers in the future to use alternatives that would not be subject to the provision of this rule. (*e.g.,* alternatives that do not include a regulated substance or otherwise have a GWP equal to or below 53). Based on its analysis, EPA finds that the 2023 Technology Transitions Rule has the effect of reducing estimated compliance costs associated with the final ER&R Rule. As industry transitions away from higher-GWP HFCs in response to the 2023 Technology Transitions Rule it is expected to reduce the overall amount of equipment effected by the final ER&R Rule requirements (*i.e.,* appliances that use an HFC or substitute for an HFC with a GWP greater than 53). However, EPA disagrees with the commenter's assertion that the requirements are unnecessary and notes that the justification for the requirements are explained in the sections of the preamble discussing the respective requirements, as well as in the relevant sections of the proposal. EPA also disagrees with the commenters' assertions that the requirements will result in little practical gain. EPA's analysis describing the benefits of these requirements can be found in the RIA addendum and the Economic Impact and Benefits TSD for this rule.

EPA also disagrees with the commenter's assertions that equipment covered under this rule's provisions will become obsolete due to the HFC phasedown under the AIM Act, and that the rule's provisions are therefore adding unnecessary regulatory burden without providing additional benefits. Provisions promulgated in this rulemaking have compliance dates beginning between 2026–2030 and cover a broad range of new and existing equipment that will use regulated substances or substitutes for a regulated substance with GWPs greater than 53 after the last phasedown step is scheduled to occur in 2036. While these compliance dates overlap with the compliance timelines established for new equipment under the 2023 Technology Transitions Rule, some new refrigerant-containing equipment purchased after the applicable compliance date for the sector or subsector in the 2023 Technology Transitions Rule will still use regulated substances or substitutes with GWPs greater than 53 and thus will be subject to the regulations established under the ER&R program. Additionally, existing equipment that is not subject to requirements under the 2023 Technology Transitions Rule will still be subject to the ER&R program's provisions until the end of its useful life. Thus, by promulgating regulations intended to maximize reclamation and minimize release of HFCs from equipment in this rulemaking, EPA is addressing equipment, practices, and activities that are not specifically addressed under other AIM Act programs.

Comment: Two commenters opposed EPA's use of climate benefits in the analysis. The commenters claimed that the purpose of the AIM Act is to promote American manufacturing, not to regulate GHGs, and stated that the statute itself never mentions GHGs or climate change, which the commenters stated was for good reason, since the divisiveness of climate change policy prevented Congress and the Executive from reaching consensus on any policy explicitly directed at climate change. Instead, the commenters asserted that the law (as evident in the title ''`Innovation and Manufacturing' '') focused on the economic benefits to certain U.S. chemical manufacturers, including fostering innovation in the chemicals industry. The commenters further pointed to EPA's statement that the social cost of carbon is not a record basis for the Agency action, which they alleged to be an acknowledgement that EPA cannot legally take climate benefits into account. One of the commenters stated that EPA expressly disclaims any reliance on the ''High Additionality'' scenario as the legal basis of the proposed rule.

This commenter further claimed that there is zero benefit from mandating the

use of reclaim gas in various RACHP subsectors, citing Table 8 of the proposed rule, and that EPA glosses over the lack of any benefit in its cost-benefit analysis for the reclaim provisions. The commenter further claimed that contrary to its duty to use reasoned decision making, EPA fails to engage in any substantive discussion of why an agency would adopt a rule (such as the reclaim mandate) that has no benefits that the government can legally promote. The commenter claimed that the AIM Act is not a climate law, that climate change is not part of the AIM Act, and that climate change cannot be considered as a justification for implementing regulations under the statute. The commenter concluded that EPA has failed to explain why a regulation with no economic or environmental benefit should be added to the regulatory burden on the refrigerant sector, and that the rule is arbitrary and capricious.

The other commenter stated that EPA's cost-benefit analysis improperly considers assumed climate benefits and foreign benefits while failing to consider overwhelming cost-benefit imbalances to U.S. manufacturers, and that adequate data was not gathered from impacted industries. The commenter asserted that climate benefits were not Congress' goal, that climate change is not part of the AIM Act and may not be considered as a justification for implementing regulations under the statute, and that given the statutes [sic] sole focus on American manufacturing, EPA's use of cost-benefit analysis of climate change benefits to justify the refrigerant management requirements is based on improper considerations. Accordingly, the commenter stated EPA should remove the discussion of climate benefits from the rulemaking record and rely solely on the core cost-benefit considerations, which they asserted overwhelmingly militate against the proposed rulemaking. The commenter stated that the rulemaking proposal makes clear that the costly burden on refrigeration users would not be justified, except if EPA uses the asserted benefits of climate change as a justification for the rule. Further, the commenter claimed that EPA may not use supposed climate benefits for foreign countries or residents of foreign countries as a basis for regulation of domestic industries, citing *E.E.O.C.* v. *Arabian Am. Oil Co.,* 499 U.S. 244, 254 (1991).

The commenter also claimed that EPA's cost-benefit analysis is incomplete, and that since the purpose of the AIM Act, and therefore EPA's rulemaking, is focused solely on American innovation and manufacturing, EPA must assess the costs and benefits of the proposed HFC management rule in relation to the proposed rule's potential impact on the U.S. manufacturing sector. The commenter stated that this analysis should include an assessment of how certain chemical producers of HFC substitutes are benefiting from the AIM Act in general and the management rule in particular, and that EPA's analysis should disclose how the chemical industry that produces substitute chemicals as replacements for HFCs currently used in IPR and other refrigeration equipment might benefit as a result of the government's intervention into the refrigerant sector through product bans. A third commenter stated that the value proposition of implementing the proposed rule is significant but suggested that a further analysis of the $3.7 billion that EPA estimated in total costs is needed.

Response: With regard to reasons explained in greater detail in the prior response and elsewhere in this rulemaking, the Agency has included estimates of the costs and benefits of this rulemaking in the RIA addendum (and reevaluated the costs and benefits of the final rule under two principal scenarios and provided sensitivity analyses around these estimates), to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, that analysis does not form a basis or rationale for any of the provisions EPA is promulgating in this rulemaking. The Agency did not rely on the ''High Additionality'' scenario performed for the proposed rule, just as it did not rely on *any* other scenario performed, as a basis or rationale for this rulemaking. Likewise, we are not relying on any scenario performed for the final rule to justify the regulations finalized in this rule. To the extent these comments assume that this rule is based on the monetized climate benefits reflected in the RIA addendum, those assumptions are based on a mistaken premise. As explained in the proposal and in section I.C of this preamble, while EPA included estimated climate benefits in the RIA addendum that were calculated using SC–HFCs, EPA did not rely on those estimates of the monetized climate benefits of the estimated HFC emissions reductions as a record basis for the Agency's action and would reach the conclusions in this rule even in the absence of the SC–HFCs. In clarifying the role of these analyses in the decision making for this rule, EPA is not taking any position on what SC–HFC benefits it could or could not take into account as a legal matter, but rather is simply describing, as a factual matter, its approach in this rule. In addition, as explained throughout this preamble, this rulemaking is designed to serve the purposes identified in subsection (h)(1) of the AIM Act of maximizing reclamation and minimizing the release of regulated substances and ensuring the safety of technicians and consumers. To the extent that these comments are intended to suggest that EPA cannot consider effects on GHG emissions in promulgating regulations under subsection (h), that position is at odds with the plain text of the Act. For example, as explained previously, HFCs are potent GHGs and subsection (h)(1) directs EPA to establish certain regulations for purposes which include minimizing releases of HFCs from equipment.[181] Thus, subsection (h)(1) on its face authorizes EPA to regulate certain GHGs and to focus on minimizing certain sources of emissions of those GHGs, indicating that Congress intended for EPA to address these GHG emissions under subsection (h).

With respect to the commenter's assertion that EPA may not rely on climate benefits for foreign countries or residents of foreign countries as a basis for regulating domestic industries, EPA responds that it is not clear what relevance this assertion has to this rulemaking. As noted previously, EPA is not relying on the quantification of climate benefits in the RIA addendum as a record basis for this rulemaking. Further, while the commenter cites *E.E.O.C.* v. *Arabian Am. Oil Co.,* 499 U.S. 244, 254 (1991), it is unclear what bearing that decision is to convey with respect to this rule, as it addresses whether Title VII of the Civil Rights Act of 1964 applies extraterritorially to regulate the employment practices of United States employers who employ United States citizens abroad, and the commenters have offered no further explanation. To the extent the commenter was indicating that EPA may not use the global SC–HFC estimates in the RIA addendum, EPA addressed accounting for global damages in EPA's ''Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific

[181] The comments emphasize the appearance of the terms ''innovation'' and ''manufacturing'' in the title of the AIM Act, but ''headings and titles are not meant to take the place of the detailed provisions of the text.'' *Bhd. of R.R. Trainmen* v. *Balt. & O.R. Co.,* 331 U.S. 519, 528 (1947).

Advances'' (Nov. 2023).[182] For additional discussion on this issue, EPA also refers the commenter to Appendix A of the response to public comments document available in the docket for ''Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review.'' [183] With respect to the commenter's position that there are ''zero benefits'' from reclaim, EPA disagrees. In the RIA addendum and Economic Impact and Benefits TSD, while we conservatively do not attribute emission reductions from such provisions, we do estimate a reduction in consumption of HFCs. Regardless, the purpose of these provisions is not to provide a specific benefit; rather, as already explained, the purpose is to help fulfill in a reasonable manner the purposes identified in subsection (h)(1), including the purpose of maximizing reclamation.

Furthermore, the Agency refers the reader to some publicly available information which may be of interest to these commenters. Information on the production and consumption of HFCs is provided on EPA's HFC Data Hub.[184] While information on chemical producers' ''benefits'' are not reportable under AIM Act regulations, EPA invites the commenter to refer to company reports including filings with the U.S. Securities and Exchange Commission. For the manufacturing sector, EPA also directs the commenters to a 2018 industry-commissioned study titled *Economic Ratification of the Kigali Amendment,*[185] which found significant economic benefits in terms of increased manufacturing output and job creation.

Lastly, regarding one commenter's request for the Agency to conduct further analysis of the $3.7 billion in estimated costs, EPA has reevaluated the final rule and included information on the costs and benefits in the Economic Impact and Benefits TSD. Although the commenter was not specific on what costs a further analysis should include, EPA has provided further information to comply with Executive Orders and has also included the RIA addendum in the docket, though the Agency is not relying on that as a fact basis for the decisions in the final rule.

Comment: One commenter stated that they did not carefully reproduce the estimated savings and benefits as would have been done if there had been more time for comments, but claimed that the estimated savings assumption ''would not be expected to decrease over time, as the cost of refrigerant would not decrease with the average GWP.'' The commenter suggested that it is possible that the cost of refrigerant will decrease over time as it has in the past and as there is more extensive use of non-fluorinated alternatives.

Response: EPA agrees that the cost of refrigerants may decrease over time, but also notes it may increase over time as HFCs are phased down. In light of this uncertainty and for consistency and comparability with prior analyses, in the RIA addendum and Economic Impact and Benefits TSD EPA has applied a constant cost for new refrigerant (of $4 per pound) equal to that used in previous analyses under the AIM Act. EPA further notes that a slightly higher cost (of $4.40 per pound) was applied for reclaimed refrigerant. More details on these assumptions and resulting estimated costs and benefits, and a sensitivity study of the cost of reclaimed refrigerant, can be found in the RIA addendum and Economic Impact and Benefits TSD, which are available in the docket for this rule.

Comment: One commenter stated that they are a champion of LRM, a climate change mitigation strategy aimed at detecting and repairing refrigerant leaks; recovering, reclaiming, and destroying refrigerant; and designing and installing equipment with high energy efficiency and lower-GWP refrigerants. The commenter shared that LRM can have a profound climate impact, with the potential to mitigate 91 gigatons of CO_2e globally by 2100, with a tenth of those emissions reductions happening in the United States.

Response: EPA acknowledges the commenter's perspective. The Agency notes that several of the strategies mentioned by the commenter are similar to requirements being finalized in this rule. While outside the scope of this rulemaking, EPA also notes that the Agency has restricted the use of higher GWP substances in multiple RACHP, foams, and aerosol subsectors in the 2023 Technology Transitions Rule (88 FR 73098, October 24, 2023).

Comment: One commenter requested that EPA confirm the impacts of the technology transitions mandates that were considered in the proposed rule, and if they were not considered, the commenter requests that EPA reconsider the impacts of technology transitions in a supplemental rulemaking.

Response: EPA responds that the 2023 Technology Transitions Rule was not final at the time of the proposed rulemaking and thus was not included in the baseline for the costs and benefits analysis completed for the proposal. However, given the 2023 Technology Transitions Rule has since been finalized, the impacts of that rule are assumed in the baseline for the costs and benefits analysis conducted for this final rule. These assumptions are detailed in the RIA addendum that is available in the docket for this rulemaking.

Comment: Several commenters, in broad support of the proposal, stated that the rule's requirements enhance LRM and implement activities and practices which assist in preventing leaks and encourage the recovery and reclamation of HFCs. The commenters highlighted their joint report ''The 90 Billion Ton Opportunity: Lifecycle Refrigerant Management.'' One of the commenter's stated that minimizing leaks from appliances and ensuring the recovery, reclamation, and destruction of refrigerants at EOL could avoid the emissions of 9.2 billion $MTCO_2e$ by 2100 in the United States alone. The commenter stated that the widespread adoption of LRM globally could avoid emissions up to 91 billion $MTCO_2e$ by 2100.

Response: EPA acknowledges the commenters' broad support for the rule. As described elsewhere in this preamble, this rule is designed to serve the purposes identified in subsection (h)(1) of the AIM Act, including minimizing releases of HFC from equipment and maximizing reclamation.

Comment: One commenter stated that owners and operators of systems of all sizes will incur economic benefits from promptly repairing leaks. The commenter stated that better maintenance of systems through leak repair will save owners and operators money by reducing the amount of HFC needed to service existing systems and ensure the viability of refrigerated products.

Response: As it is consistent with the analysis that EPA prepared for the final rule, EPA agrees that owners and operators of equipment subject to this final rule may incur economic benefits through prompt leak repair. EPA provided an analysis of different charge size thresholds for leak repair in the draft TSD, *Analysis of Economic Impact and Benefits of the Proposed Rule* (see Appendix F of docket item number EPA–HQ–OAR–0606–0023 attachment 2). Further discussion of the rationale

[182] Available at: *https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf.*

[183] Available at: *https://www.regulations.gov/document/EPA-HQ-OAR-2021-0317-4009.*

[184] Available at: *https://www.epa.gov/climate-hfcs-reduction/hfc-data-hub.*

[185] Inforum and JMS Consulting, 2018. Economic Impacts of U.S. Ratification of the Kigali Amendment. Available at: *https://www.alliancepolicy.org/site/usermedia/application/6/Kigali_Economic_Report.pdf.*

for the 15-pound charge size threshold is explained in section IV.C.2. of this preamble.

Comment: Another commenter expressed support for EPA's proposed leak detection and repair requirements. The commenter noted that these proposed requirements will have positive benefits for the atmosphere and climate and will help ease demand for servicing gas.

Response: As it is consistent with the analysis that EPA prepared for the final rule, EPA agrees with these statements.

Comment: One commenter in support of the leak repair and ALD provisions in the proposal stated that many New York businesses would experience savings upwards of $13 million by 2025 by lowering overall refrigerant and energy costs.

Response: EPA acknowledges the commenter's support for the leak repair and ALD requirements and agrees that refrigerant management will lead to savings on refrigerant and energy costs. Although EPA did not analyze the effects on New York or any other State individually, please see the Economic Impact and Benefits TSD for an analysis of the country as a whole.

Comment: One commenter asserted that lowering the charge threshold to five pounds would yield significant additional avoided GHG emissions. The commenter mentioned that most of the additional reductions are estimated to come from road transport refrigeration units, which, under the 2023 Technology Transitions Rule, are not yet required to transition to low-GWP refrigerant alternatives and have high estimated annual leak rates. The commenter noted that road transport refrigeration units merit being subject to additional leak management requirements. Another commenter similarly stated that lowering the charge size threshold would provide additional emissions benefits from the road transport sector. The commenter further stated that a five-pound threshold would avoid emissions totaling 86 $MMTCO_2e$ by 2050 with annual refrigerant savings of $1,080,000.

Response: EPA explains the Agency's decision to set a leak repair charge size threshold of 15 pounds rather than 5 pounds in section IV.C.2 in this final rule. EPA provided estimates of the compliance costs and emissions reductions of the proposed leak repair and inspection requirements using various charge size thresholds in the RIA addendum and Economic Impact and Benefits TSD associated with the proposed rule for informational purposes and to comply with Executive Orders. EPA notes that in these documents as updated for this final rule the Agency assessed the impacts of road transportation refrigeration units using reclaimed refrigerant for servicing or repair. Additionally, as a point of clarification, EPA notes that while the 2023 Technology Transitions Rule did not set a GWP limit for all refrigerated transport, it did ban many high-GWP blends containing regulated substances, including R–404A, which was the primary blend previously used, in certain refrigerated transport subsectors, beginning January 1, 2025.

Comment: Three commenters expressed concern that lowering the applicability threshold for the leak repair requirements would significantly increase costs for sources. One of the commenters mentioned that even EPA's analysis indicated that lowering the threshold to 15 pounds, or even 30 pounds, would not be cost-effective. Another commenter stated that with the 15-pound threshold that EPA proposed, the number of covered appliances for one of its' members' enterprises would increase more than ten-fold (from 600 to 6,100 individual units). The commenter claimed that such a dramatic increase in the number of covered appliances could result in approximately $1 billion in additional capital costs to the company over the next 10 years. The commenter further stated that another member estimates that conducting site surveys of all of its stores to identify newly covered appliances under the "15-pound threshold" would cost roughly $500 to $1,000 per site, depending on location and size. When multiplied across many sites, this would lead to significant costs just to identify newly covered equipment. The commenter stated that as a practical matter, regulating small, packaged units, VRF systems, and mini-splits would greatly increase the recordkeeping burden on owners and operators under the regulations, and would increase costs for inspections and carrying out retrofit and/or retirement plans. The commenter stated that many HVAC appliances contain multiple circuits within a unit, each with its own recordkeeping obligations and leak rates. This increases compliance costs and makes it more difficult to fix, repair, and/or retrofit appliances.

EPA also received another comment similarly claiming that the rule would impose a financial burden to food retailers due to the increased number of affected appliances. Specifically, the commenter estimates that audits of stores to determine which appliances would be subject to the leak repair requirements would cost between $1,000 and $2,000 dollars per supermarket and upwards of $700 dollars for convenience stores, further estimating a total cost of $258,872,850 to the food retail industry. The commenter also expressed concern that many smaller appliances would need to be added to a company's recordkeeping, because appliances not previously covered under CAA section 608 would not have had their full charge data captured. The commenter claimed that some companies may have voluntarily kept records of appliances under 50 pounds, however these records would not have been kept with the same rigor as recordkeeping required under CAA section 608. The commenter estimates the costs of reweighing smaller refrigerant-containing appliances to determine full charge will cost individual stores a minimum of $1,287 which industry-wide would result in an additional $81,534,800 in compliance costs.

Response: EPA is finalizing the 15-pound charge size threshold as proposed for the leak repair requirements in this final rule after consideration of a number of factors, including information regarding where HFCs or their substitutes are currently being used in refrigerant-containing appliances and where they are expected to be used in the coming years. EPA also considered, for example, changes to the market for refrigerant-containing appliances over time, design elements of different types of refrigerant-containing appliances with different charge sizes and their respective propensity to leak (*e.g.,* whether equipment is hermetically sealed), and whether refrigerant-containing appliances at specific charge sizes are typically repaired or disposed of. As previously stated, in the RIA addendum and Economic Impact and Benefits TSD for the proposed rulemaking the Agency assessed different thresholds. These assessments were prepared to provide additional information, increase transparency to the public, and comply with Executive Orders. EPA did not consider the cost-effectiveness of a specific charge size threshold in its reasoning for finalizing the 15-pound charge size threshold for the leak repair provisions; however, for informational purposes the Agency provided the cost assessments at different charge thresholds in the Draft Economic Impact and Benefits TSD associated with the NPRM. Further discussion on the charge size threshold for the leak repair provisions in this final rule can be found in section IV.C.2.

Regarding one commenter's assertion that the rule would institute additional recordkeeping and compliance costs for certain HVAC appliances, the Agency

refers the commenter to further discussions on the exemption of refrigerant-containing appliances used in the residential and light commercial air conditioning and heat pumps subsector in section IV.C.2. EPA notes that several of the refrigerant-containing appliances the commenter describes (*e.g.,* mini-splits) may be considered a part of the residential and light commercial air conditioning and heat pumps sector and thus are exempt from the leak repair requirements in this final rule. EPA disagrees with the commenters' assessments of capital costs associated with complying with the leak repair provision and with the comments related to site surveys and store audits. Owners and operators will need to review an inventory of equipment and assess which equipment is subject to the rule's leak repair requirements regardless of where the threshold is set. Supermarkets and other entities should be able to ascertain which appliances are at or above the 15-pound threshold. Furthermore, owners or operators most likely have records of refrigerant-containing appliances that would allow them to determine if the full charge was at or above the 15-pound threshold. For instance, owner's manuals might provide the OEM's assessment of the full charge, or service records from when the equipment was installed and first filled or checked might provide the necessary information. The Agency understands that most stand-alone units would be below 15 pounds but to the extent that certain stand-alone units are above the 15-pound threshold owners or operators should be able to easily determine the charge size and type of refrigerant being used via a manufacturer label. Further, if an owner or operator is using the same make and model of refrigerant-containing appliance then they would not need to verify each individual appliance. Remote condensing units (*e.g.,* supermarket cold rooms) may also have charge sizes at or above 15 pounds but as previously stated, previous records, manufacturer labels, and other information readily available should make the determination of the charge size for any such appliances uncomplicated. The recordkeeping for owners and operators is similar in nature to those required under the CAA section 608 regulations. Therefore, most owners and operators should already be familiar with the requirements being applied in the rule. The total estimated recordkeeping and reporting costs are provided in the Economic Impact and Benefits TSD and the assumptions for the various leak repair and inspection actions anticipated are likewise provided in Appendix A of the TSD. EPA does not anticipate that it would typically be necessary to conduct full store audits of appliances or reweigh appliances in the way the commenters suggest for these reasons. EPA notes that in this final rule, the Agency delayed the date by which an owner or operator must determine the full charge of appliances containing 15 or more pounds of refrigerant and keep records of such, from 60 days after publication until January 1, 2026, and that such change allows owners and operators to collect the required information in the normal course of business. Thus, EPA disagrees with the asserted cost estimates for determining which appliances are subject to leak repair under the final rule, even in the absence of voluntary recordkeeping of refrigerant-containing appliances which may be subject to the leak repair requirements.

Comment: One commenter claimed that technician and equipment shortages and complexity of supermarket systems will make compliance with the one-year retrofit or retirement requirements difficult. The commenter also stated that the retrofits complying with the 2023 Technology Transitions Rule will further complicate compliance with the rule's deadline. Thus, the commenter asserts that owners or operators will incur significant excess costs to meet the retrofit or retirement requirements in the rule.

Response: EPA disagrees that 12 months is not enough time for an owner or operator to implement their retrofit or retirement plan as required under this rule, and further notes that the rule allows owners or operators to seek extensions if certain criteria are met. Owners or operators have up to 30 days to repair commercial refrigeration appliances (or 120 days if an industrial process shutdown is required) and extensions can be requested if certain criteria are met. During the leak repair process an owner or operator would know if a refrigerant-containing appliance is unable to be repaired and would therefore require retrofit or retirement. As discussed in section IV.A.2, EPA under the definition of "retrofit" being finalized in this rule, retrofitted refrigerant-containing appliances will not be required to transition to lower-GWP alternatives. The Agency, however, still encourages owners or operators that are retrofitting refrigerant-containing appliances to transition to a lower-GWP refrigerant. Further, in response to the commenter's concerns with complying with the 2023 Technology Transitions Rule, we note that restrictions on retrofits are not included in that rule and thus disagree with the commenters' assertion that that rule would complicate compliance with this rule's deadlines for retrofit or retirement plans. Additionally, the Agency notes that the commenter did not provide detailed information or data to support—or to allow EPA to more fully assess—the commenter's claims regarding potential technician and equipment shortages and how these factors would affect compliance with the retrofit and retirement requirements in the final rule or lead to excess costs.

Comment: The commenter recommended that EPA follow CARB's leak repair timeline of 14 days from the initial detection of the leak to ensure that any detected leak is repaired in a timely fashion because this approach reduces both emissions and additional refrigerant costs to appliance owners and operators.

Response: EPA agrees that the quicker a leak is repaired, the more emissions and additional refrigerant costs would be mitigated (up to the time that the entire charge has leaked out). EPA does not agree with the commenter that it would be appropriate to establish a 14-day repair timeline for the requirements in this rule. The amount of time provided to repair a leak and the reasoning for that decision is provided in section IV.C.3.b of this preamble. For analysis purposes, as explained in the RIA addendum and Economic Impact and Benefits TSD, EPA estimated that leaks would be noticed and repaired early due to the provisions of this rule.

Comment: Another commenter expressed support for EPA's proposed leak detection and repair requirements. The commenter noted that these proposed requirements will have positive benefits for the atmosphere and climate and will help ease demand for servicing gas.

Response: EPA agrees that leak detection and repair requirements will have a beneficial impact on the environment and has provided estimated benefits of these impacts in the Economic Impact and Benefits TSD. EPA agrees that the detection and repair of leaks is effective in reducing the quantity of gas necessary for servicing existing equipment.

Comment: One commenter stated that EPA significantly underestimated the costs of installing ALD systems. The commenter stated that EPA's cost estimates for direct ALD systems do not include all the types of costs that owners or operators will incur. The commenter recommended that EPA develop cost estimates that also consider the following:

- Reviewing the ALD system requirements,
- preparing the process design for equipment installation, which includes safety and electrical reviews,
- preparing bid packages and reviewing bids,
- developing detailed mechanical designs (which would include the hardware/software needed to tie the systems to control houses and panels that may need to be modified),
- project cost estimating,
- management reviews,
- construction contracting,
- field installation, and
- testing.

With regards to indirect ALD systems, the commenter noted that EPA indicated that indirect systems have been installed in some retail stores but did not provide any information on applications in industrial facilities. The commenter suggested that the cost estimate for indirect ALD systems is orders of magnitude below what the actual costs will be because indirect ALD systems require specialized monitoring systems and require constant monitoring from complex logic systems to detect losses. The commenter also expressed concern that the TSD for ALDs did not include any references to discussions with equipment suppliers about actual fully installed appliances and recommended that EPA take steps to develop more realistic costs estimates before finalizing the proposed rule. The commenter also stated that EPA's reference for the cost estimates, ''Abt Associates, Supplemental Automatic Leak Detect System Draft Analysis, 2023, prepared for EPA Stratospheric Protection Division,'' was not included in the docket.

Response: EPA responds that the commenter did not provide information on how their examples of costs apply to the costs associated with the installation and use of direct ALD systems nor did the commenter provide estimates of such costs. While EPA agrees to that project planning would need to take place to decide if an owner or operator would prefer to use and indirect or direct ALD system (including planning for the placement of refrigerant sensors) EPA disagrees that these actions would drastically increase the cost estimates provided in the RIA addendum and Economic Impact and Benefits TSD. Furthermore, some of the costs cited by the commenter like testing, installation, and construction contracting would reasonably fall under the installation cost estimates *Unit Cost Assumptions* Table in the RIA addendum and Economic Impact and Benefits TSD.

Regarding the commenter's statements on the installation and use of indirect ALD systems in industrial applications, EPA notes that the information provided on indirect systems installed in some retail stores in the TSD titled *American Innovation and Manufacturing Act of 2020—Subsection (h): Automatic Leak Detection Systems* was exemplary only and was not intended to represent all such installations. EPA provides information on the industries potentially affected by this rule both in the preamble to the proposed rule and the preamble to the final rule. A list by NAICS codes is also available in Appendix H of the Economic Impact and Benefits TSD. A full list of applications in any subsector of the industry is not plausible and not required for this rule; owners and operators whose equipment falls under the scope of the requirements (*e.g.,* full charge size of 1,500 pounds or more, installed on or after January 1, 2017) are required to install and use an ALD system in the time frame set out by the final rule. The Agency reiterates that estimates in the RIA addendum and Economic Impact and Benefits TSD were provided for informational purposes and to comply with Executive Orders; the decision to require ALD systems for certain refrigerant-containing appliances and allow owners or operators to choose whether to use a direct or indirect system, as explained in section IV.D.1 of this preamble, serves the purposes described in subsection (h)(1), including the purpose of minimizing the release of regulated substances from equipment.

In addition, EPA notes that the commenter did not provide specific information on ''realistic'' costs that the commenter would have EPA incorporate into the final RIA addendum. EPA disagrees with the commenter's assertion that the cost estimates for the installation of an indirect ALD system is below the actual costs of installation of an indirect ALD system because existing refrigerant-containing appliances' control modules do not have the capability to do the logic calculations necessary to detect leaks. Indirect ALD systems are software-based detection tools that communicate with existing hardware on the refrigerant-containing appliance to detect leaks. Since the Agency has changed the scope of applicability for existing refrigerant-containing appliances for the ALD installation and use requirement from the proposal (specifically only refrigerant-containing appliances installed on or after January 1, 2017, are required to install an ALD) the control modules on these appliances should be advanced enough to functionally use an indirect ALD system. Additionally, if an owner or operator were to find that a particular ALD technology (direct or indirect) would not suit their refrigerant-containing appliance, they have the option of choosing another ALD technology to meet the rule's requirements. Furthermore, the reasons for the requirements for ALD system, as explained in section IV.D.1 of this document, are not based on keeping below any specific cost; rather, it is based on serving the purposes described in subsection (h), as previously stated. Further discussion on the Agency's rationale for requiring the use of ALD systems for certain refrigerant-containing appliances can be found in section IV.D.1. In reference to the comment regarding EPA's numbers used in *Table A–4—Unit Cost Assumptions* table found in the RIA addendum, EPA acknowledges the cited source was not included in the docket at proposal and notes that it has docketed the relevant information from the document and corrected the citation (titled *Supplemental Information on Automatic Leak Detection Systems* available in the docket (EPA–HQ–OAR–2022–0606)). The information used was accurately described and summarized in the draft RIA addendum for the proposed rule and likewise in the analysis for the final rule.

Comment: A commenter requested a 2,000-pound threshold if EPA maintains the ALD installation requirement for some appliances. The commenter asserted that EPA's RIA suggested that thresholds below 2,000 pounds are not cost-effective. The commenter also asserted EPA should further evaluate the cost-effectiveness of a threshold higher than 2,000 pounds and, at a minimum, should not finalize any threshold below 2,000 pounds.

Response: As discussed further in section IV.D.1 of this preamble, the Agency is finalizing the 1,500-pound threshold for IPR and commercial refrigeration appliances containing an HFC or substitute for an HFC with a GWP greater than 53 as proposed. In the RIA addendum and Economic Impact and Benefits TSD for the proposed rulemaking, the Agency provided information on the costs and benefits of choosing a different threshold; however, EPA notes that the figures presented in the RIA are for informational purposes and to comply with Executive Orders and were not used as a record basis for deciding the threshold for ALD installation requirements. When deciding the charge size threshold for IPR and commercial refrigeration

appliances subject to this provision EPA considered the relative risks of leaks from larger refrigerant-containing appliances and the supply of ALD systems to facilitate compliance with the provision. With those considerations, EPA finds the 1,500-pound threshold appropriate for serving the purposes described in subsection (h)(1), including the purpose of minimizing the release of regulated substances from equipment.

Comment: A commenter stated that the proposed rule would require carriers in the commercial airline industry that maintain large chiller systems at airports to install ALD systems at high costs.

Response: EPA responds that the commenter did not provide any information or data to support their assertions regarding the effects of the costs associated with the installation and use of ALD systems for chillers at airports on the commercial airline industry, nor did they provide any information indicating how or why EPA should change the proposed rule to account for these costs.

Comment: A commenter claimed that mandating leak searches and adding ALD further adds to consumer costs.

Response: EPA responds that the commenter did not provide sufficient information to describe why or how the costs related the leak repair and ALD requirements would lead to more costs and thus be passed onto consumers. EPA understands that refrigerant and the maintenance of refrigerant systems are a small percentage of the overall costs of owning such refrigerant-containing appliances. The effective repair of leaks and the earlier detection of leaks via ALD systems is anticipated to lead to more cost savings for owners and operators, as properly functioning refrigerant-containing appliances are more energy efficient and require fewer refrigerant additions.

Comment: One commenter suggested that EPA provided no proof that the objectives noted in the proposed rule for reclamation to bolster the current supply of HFCs with recovered and reclaimed refrigerants from existing systems, support a smooth transition to substitutes for HFCs, minimize disruption of the current capital stock of equipment by allowing its continued use with existing refrigerant supplies, avoid supply shortages of virgin refrigerants, and insulate the industry against price spikes that could affect the servicing of existing systems using HFCs can be achieved. The commenter also claimed that EPA's claims of cost-savings are contradicted by the RIA, which did not monetize any of the supposed benefits.

Response: EPA disagrees with the commenter and directs the reader to section IV.E of this preamble for additional information on the reclamation requirements. EPA notes that there was a 40 percent increase in the mass of HFCs reclaimed from 2021 to 2022, and approximately a 20 percent increase from 2022 to 2023, which may be an indication that there will be additional shifts in the reclamation market.[186] In EPA's experience with the CFC and HCFC phaseouts, the Agency has seen continued use of reclaim, indicating that equipment was and, in many cases, still is operating utilizing refrigerants that have been phased out. Throughout those phaseouts, EPA has not seen any significant disruption or premature retirement of equipment due to refrigerant shortages, nor did the commenter provide any evidence thereof for the CFC and HCFC phaseouts, nor any reason to think such effects would occur for the HFC phasedown.

In the RIA addendum and Economic Impact and Benefits TSD, EPA has estimated the costs and benefits of the regulations. While the commenter seems to indicate that cost savings were not included in the analysis, EPA notes that cost savings associated with avoided refrigerant losses were included in the analysis conducted for both the proposed and final rule. More information on these assumptions can be found in section VI.B.2 of this preamble as well as the RIA addendum and Economic Impact and Benefits TSD.

Comment: One commenter stated that the modeling conducted in support of the AIM Act regulations appears to rely on refrigerant recovery in disposal and servicing of appliances that may exceed what current regulations will achieve. The commenter cited the RIA for the allocation regulation and the RIA for the 2023 Technology Transitions Rule, on the basis of which the commenter stated their understanding is that EPA may expect a 100 percent recovery rate. The commenter noted that despite the proposed rule's multiple measures, the proposal has few provisions regarding the disposal side of refrigerant recovery or the recovery of refrigerants at EOL. The commenter stated that residential EOL disposal and recovery is not discussed in EPA reclaim market report provided in the docket, but residential appliances are an important source of HFC consumption and emissions. The commenter shared a concern that there is little incentive for individuals that may collect residential appliances, such as from a curbside, to properly recover refrigerants before transferring the equipment to a recycling or other disposal facility, and stated that entities that accept EOL equipment, like metal recovery facilities, may request that refrigerant be vented prior to disposal so that they are not subject to regulation, creating a gap in enforcement of existing regulations and undermining reclaim supply. The commenter stated that of the jurisdictions with refrigerant collection policies, Japan may have the most recovery and Japan's government reports a 40 percent recovery rate. The commenter stated that based on information provided by EPA, the recovery rate in the United States is much lower than this and much lower than what may have been modeled in the AIM Act rulemakings. The commenter added that even the volume of HFCs contained within products exceeded the recovery rate in 2020 by seven times. The commenter further noted that one benefit of the proposed regulation is that by increasing the demand for reclaim, it also provides additional incentive for refrigerant recovery. However, the commenter stated that based on the industry report provided by EPA in the docket, the examples from other jurisdictions suggest that incentives are not enough to ensure a high rate of recovery. The commenter stated that EPA's modeling assumptions may only be achievable through robust enforcement and incentives.

Response: EPA confirms that the modeling conducted for the RIA and RIA addenda for the HFC Allocation and 2023 Technology Transitions rules do assume improvements to refrigerant recovery rates, during service and at disposal, in some of the potential compliance pathways. However, the rate of recovery assumed in this modeling was not 100 percent. To represent improvements to refrigerant recovery rates possible under the provisions of this final rule, in an alternate scenario EPA modeled an improvement in the emissions rates of all RACHP equipment (including residential) at disposal. Specifically, it was assumed that an emissions rate of three to four percent would be achieved for large and small RACHP equipment (in other words, three-four percent of equipment charge would still be emitted at EOL even with the improved recovery assumption). EPA notes that while this assumption was included in the compliance path for the Allocation Rule RIA, it was effectively treated as an uncertainty in

[186] Available at: *https://www.epa.gov/section608/summary-refrigerant-reclamation-trends.*

the subsequent 2023 Technology Transitions RIA Addendum, given that updated modeling results demonstrated that compliance with both rules could be achieved without improved recovery. As detailed in the associated RIA addendum, modeling conducted for this rule assumes that the prior improved recovery assumption would not occur in the ''baseline'' in order to conform with the base case analyzed for the 2023 Technology Transitions Rule. However, an alternative scenario has also been provided in the RIA addendum and the Economic Impact and Benefits TSD in which improved recovery is assumed to otherwise occur in the absence of this regulation, thus illustrating a lower bound of potential incremental benefits. EPA welcomes additional data and technical information on this topic and will continue to monitor industry recovery and reclamation rates in order to potentially update its modeling assumptions in the future. Finally, EPA acknowledges that further improvements in recovery rates may be achievable through enforcement and incentives such as those mentioned by the commenter.

Comment: One commenter stated that EPA is uncertain whether mandating the use of reclaimed HFCs would provide benefits in the form of additional HFC reductions. The commenter stated that EPA indicates that use of reclaimed HFCs in the RACHP subsector and fire suppression equipment ''may not yield significant additional HFC consumption reductions, relative to what was previously modeled in the Allocation Framework Rule Reference Case,'' while noting that EPA states that the ''specific provision of this proposed rule would likely increase the use of recycled/reclaimed HFCs beyond what was already accounted for in [the RIA].'' The commenter claimed that EPA offers no quantification of this increase, and that such imprecise and qualified impacts do not provide a sufficient policy basis for the imposition of requirements that will impact the HFC market as envisioned by the AIM Act.

The commenter also asserted that the proposed rule would create a captive market as opposed to one based on competition, thereby losing any economic incentives that could lower the cost of products to consumers. The commenter stated that EPA effectively requires OEMs to buy reclaimed HFCs in order to sell pre-charged HVACR equipment and technicians and others to buy reclaimed HFCs in order to ''first fill'' new equipment on-site. The commenter claimed that this creates a closed market given the finite amount of reclaimed HFCs available, citing EPA's 2023 reclaim report documenting that 1,600 MT of R–410A was available in 2022 as reclaim, which the commenter claimed, relative to estimated 2022 demand for charging new R–410A AC equipment, represents less than four percent of new equipment demand. The commenter further claimed that in its analysis for the proposed rule, EPA has not considered that the finite amount available in 2022 was likely already sold, leaving other newly obligated parties to purchase required reclaimed HFCs from a market that already has a minimum value established for R–410A. The commenter claimed that this necessarily results in an unbalanced, artificial market of EPA's creation. The commenter also stated that EPA has not analyzed the cost impact of such market conditions to the end consumer nor any potential adverse outcomes, including concentration of a finite amount of reclaimed HFCs within a relatively small number of suppliers.

The commenter also claimed that EPA utilizes ''regulatorily manufactured demand'' to estimate actual demand for initial charge of reclaimed HFCs in 2028 at 23,300 metric tons, and that by doing so EPA did not establish a ''no action'' base analysis. Instead, EPA forecasted existing demand by creating reclaim requirements meant to create this ''artificial demand.'' The commenter then stated that EPA made a faulty assumption in assuming that market forces would not be sufficient to increase reclamation before the next phasedown of HFC production and consumption. The commenter claimed that EPA erroneously concluded that voluntary reclamation programs that ''worked in Europe'' would not be sufficient to increase reclamation in the United States, and that EPA's decision to institute regulations to increase reclamation is ''at variance with the AIM Act . . . [and] arbitrary and capricious.''

The commenter further stated that reclaim requirements for HFCs are also unnecessary based on the United States' experience with the phaseout of ODS, as a reclamation market has allowed the continued use of ODS even in the absence of voluntary reclamation requirements. Furthermore, the commenter stated that the climate impact of refrigerant leaks is the same regardless of whether refrigerant is reclaimed or virgin, and that EPA has no basis for claiming that there will be a climate benefit from reclamation requirements or that reclamation will offset emissions from newly produced HFCs, either domestic or imported. The commenter stated that EPA's own analysis has not proven that increased reclamation will provide additional benefits, citing quotations from the RIA addendum. The commenter instead concluded that ''market distortion'' is the most likely outcome, with some parts of the HFC marketplace impacted more heavily than others.

The commenter additionally asserted that the RIA is inadequate to support EPA's proposed direct intervention in the market. The commenter noted that EPA states in the RIA addendum that because ''cost and emission estimates aren't available specifically in the United States context, cost savings and benefits are not directly incorporated into the overall compliance costs and benefit estimates associated with the rulemaking [provisions on reclamation],'' and states that to account for the uncertainty in EPA's intervention in the market, EPA created two scenarios: (1) Where requirements to use reclaimed HFCs result in a shift of the use of available consumption and production allowances; and (2) a 'high additionality' case where some abatement of HFCs is assumed. The commenter stated that EPA then measured the costs and benefits of reclamation using a highly flawed methodology, and that EPA calculated the incremental cost differences of virgin production, destruction, and reclamation at $0.58 per kilogram. The commenter asserted that this methodology merely compared the cost of virgin production and destruction and then subtracted the cost of reclamation, and that this calculation is effectively meaningless in the context of what EPA actually proposed.

The commenter also claimed that this analysis showed that there is already a strong economic incentive to reclaim HFCs instead of destroying them, because the estimated cost of production is $0.24 versus $0.04 for reclamation. The commenter further stated that the cost calculated does not actually reflect EPA's proposal to substitute the use of reclaimed versus newly produced HFCs, and instead assumes that all newly produced HFCs would be destroyed without EPA's proposed mandatory use of reclaimed HFCs, which the commenter describes as nonsensical. The commenter claimed that for EPA's proposed use of reclaimed HFCs to have a market effect (*e.g.,* if it is assumed that reclaimed HFCs will offset the production of virgin HFCs) then new production should be offset by 1:1 (or some other, lesser ratio) but any newly produced HFCs would logically not be concurrently destroyed. Rather, the commenter asserted, both the virgin HFC and the reclaimed HFC would eventually be destroyed,

presumably at comparable rates, meaning that the calculated benefit of $0.58 would not exist along with any derived climate benefit.

The commenter further stated that to the extent that EPA calculated the quantity of emissions prevented it appears to have assumed that 15 percent of HFCs would still be produced for blending into reclaimed HFCs and another 67 percent of HFCs would be lost in the reclamation process and eventual emissions of reclaimed HFCs. The commenter claimed that this would mean that EPA estimates that 18 percent of HFC production would be avoided due to the newly proposed requirements but claimed that EPA provided no basis for this assumption in the RIA. The commenter asserted that any claimed benefits to the climate must therefore be discounted due to a lack of explanation as to how such would occur. The commenter further claimed that EPA has not conducted sufficient analysis, and therefore cannot simply conclude that such benefits would occur, as the commenter states EPA appears to do. The commenter stated that EPA provided no TSD to support its reclamation proposal, unlike TSDs for ALD, fire suppression, and the cold chain, that the study cited (Yasaka et al. (2023)) was not provided in the docket, and that an additional report cited by EPA does not contain relevant calculations. The commenter stated that, for example, EPA cited but does not provide in the docket a report entitled ''The 90 Billion Ton Opportunity,'' and that the available copy of this report on the web contains no calculations as to the amount of HFC releases avoided through mandatory reuse of HFCs.

Response: EPA responds that, upon consideration of comments, in light of the provisions being finalized, and because of further analysis, many of the analytic assumptions mentioned by the commenter have been updated in the final rule RIA addendum and Economic Impact and Benefits TSD. In the final RIA addendum and Economic Impact and Benefits TSD, EPA only mentions the Yasaka et al. paper in passing and does not rely upon it or the calculations of costs of production, reclamation, and destruction in our calculations. Further, EPA no longer assumes the 67 percent loss with which the commenter took issue. EPA acknowledges that there is uncertainty regarding the degree to which some of the provisions contained in this final rule will lead to incremental reductions in HFC consumption and emissions when considering already in-place regulations and market forces. For these reasons, EPA has included multiple scenarios in the RIA addendum for the final rule. However, as detailed in the RIA addendum, even in EPA's most conservative assessment of the incremental benefits of the final rule, significant incremental consumption and emissions reductions occur. Although EPA conservatively assumes the reclamation provisions do not provide additional emission reductions, the analysis finds those provisions reduce HFC consumption by over 150 $MMTCO_2e$ through 2050.

EPA disagrees that existing economic incentives for reclamation in the absence of this rulemaking would represent a flaw in the analysis. As noted elsewhere in the rule preamble, some market failure may exist that acts as a barrier to businesses' adoption of the most profitable course. For example, market failures may exist where there are imperfect information or split incentives, such as decision-makers not knowing the percentage of energy use associated with different options.

EPA also disagrees that the experience of the ODS phaseout provides any proof that a voluntary reclaim market for HFCs would materialize that would serve the same goals as this rule and that the requirements of the final rule are thus unnecessary. The consumption of halons and CFCs were completely phased *out* in 1994 and 1996, respectively, and likewise later for HCFCs on a species-specific schedule. Although the ODS phaseouts effectuated a type of reclamation market, as users would need to access used or stockpiled material to service their equipment, that market was not intended to meet specific statutory provisions with respect to reclamation. As the commenter notes with statistics regarding R–410A, such a reclamation market does not exist for all HFCs currently. Further, given that HFC production and consumption are phased down, not phased out, under the AIM Act, and given the express language in the AIM Act addressing reclamation, the comparison to the ODS history in this respect is not analogous with the goals of this final rule.

EPA notes that the commenter's assertions regarding the creation of potentially anticompetitive markets for reclaimed HFCs appear to be speculative. The commenter did not provide sufficient information to support their claims or analyze the specific details of their assertions, including information addressing how the rule would lead to such adverse outcomes given the numerous EPA-certified reclaimers that exist, and the opportunity for other entities to enter the reclaim market. Nor is EPA aware of such information or analyses in the record for this rule. In addition, the Agency is not finalizing, at this time, the proposed requirements for the initial fill of refrigerant-containing equipment to be done with reclaimed HFCs, thus potentially alleviating some of the commenter's concerns. EPA has also responded to many of the commenter's concerns regarding the market for reclaimed HFCs and has described the rationale for the requirements for reclaimed HFCs that are being finalized in this rule, in section IV.E.2 of this preamble. Regarding a ''no action'' analysis, EPA notes that the Agency provided a ''Business as Usual'' scenario in the 2021 Allocation Framework Rule RIA addendum. EPA further notes that the commenter seems to misunderstand the reason for preparing the RIA addendum. As noted elsewhere in this preamble, while EPA has included estimates of the costs and benefits of this rulemaking in the RIA addendum, to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, the analysis in the RIA addendum does not form a basis or rationale for any of the provisions EPA is promulgating in this rulemaking.

Finally, in its analysis of the costs and benefits of this rule, EPA has not assumed that reclaimed HFCs are more cost-effective vis- à-vis virgin HFCs due to avoided destruction costs. Such an assumption may be defensible, and EPA is aware of the study, referenced by the commenter, indicating that reclaimed HFCs may actually be more cost-effective than virgin manufacture, when considering the full refrigerant lifecycle including destruction. While EPA referenced this study in the RIA addendum included with the proposed rule, for the final RIA addendum EPA has conservatively not included the potential savings cited by that study. Indeed, in its central base case analysis EPA has conservatively assumed a cost premium for reclaimed HFCs vis- à- vis virgin HFCs of 10 percent. For informational purposes, we also provided a sensitivity analysis around this assumption.

In response to the commenter's claim that EPA should implement a voluntary refrigerant reclamation program instead of promulgating refrigerant regulations, EPA responds that the Agency is finalizing reclamation requirements to implement subsection (h)(1) and subsection (h)(2)(B) of the AIM Act, as stated in IV.E.1. Namely, EPA instituted reclamation provisions in order to maximize reclamation and minimize releases of HFCs consistent with (h)(1), and also to implement subsection

(h)(2)(B) of the AIM Act, which provides that a regulated substance used as a refrigerant shall be reclaimed before being sold or transferred to a new owner, except where such sale or transfer is solely for purposes of reclamation or destruction of the regulated substance. The commenter fails to provide any information or analysis to support a conclusion that a voluntary reclamation program would be as well suited to meeting the objectives of this rule as the program that EPA is establishing in this rule.

In response to the commenter's assertions regarding docketing, EPA included both sources that the commenter mentioned in the docket. Yasaka et al. (2023) is included in the docket as an attachment to the docket entry for the RIA addendum,[187] while the study the commenter cites "The 90 Billion Ton Opportunity" is included in a docketed list of references from the NPRM.[188]

Comment: Another commenter stated that EPA did not clearly and consistently identify the heel estimates used when assessing potential benefits of the proposed cylinder management requirements. The commenter stated that EPA's environmental benefit analysis is contradictory, insufficiently supported, and does not rely on facts.

Response: EPA has included information in the RIA addendum and Economic Impact and Benefits TSD for the final rule regarding the assumptions, including the estimated heel, used in The Agency's analysis of the costs and benefits of the requirements for the management of disposable cylinders. Further, based on information from the commenter, EPA has provided sensitivity analyses of the related costs and benefits in Appendix K of the RIA addendum.

Comment: One commenter stated that there would be no benefit for reclaimers to recover refrigerant heels because there would be little refrigerant left in the cylinders, resulting in an expensive refrigerant from a cost per ounce perspective. Another commenter stated that EPA's RIA addendum did not provide any estimates of the costs and benefits of the proposed container tracking system. The commenter stated that EPA cost estimates appear to be entirely based on the separate requirement regarding the recovery of cylinder heels.

An additional commenter stated that there is no benefit to forcing empty disposable cylinders to outside facilities and that tracking cylinders will increase costs.

Response: EPA has estimated the costs and benefits of requirements to manage disposable cylinders and heels in the RIA addendum and Economic Impact and Benefits TSD for the final rule. EPA is not finalizing the cylinder tracking requirements at this time, and thus costs related to those provisions are not included in the costs from the aforementioned RIA addendum and TSD. EPA notes that for consistency with previous regulations under the AIM Act, the Agency assumed the value of the recovered heel is $4 per pound. That said, EPA expects that given the HFC phasedown that is underway, those costs could increase over time, providing more value to those recovering the heels. The reasons for establishing these requirements related to disposable cylinders and heels are explained in section IV.G of this document.

Comment: One commenter also stated that there will be a cost impact throughout the supply chain to handle the logistics and tracking required to recover a likely small amount of HFCs. The commenter expressed concern with the net environmental impact of reclaiming the heel refrigerant from disposable cylinders in the MVAC sector after considering the transport, handling, and reclamation energy required to extract the remaining refrigerant, and the commenter urged EPA to consider all factors involved in the net environmental benefit of heel reclamation before implementing the rule.

Response: EPA has estimated the costs and benefits of the requirements to manage disposable cylinders and send heels for reclamation in the RIA addendum and Economic Impact and Benefits TSD for the final rule. EPA's assessment included additional costs related to transport and the labor costs, plus overhead, for handling and transporting such cylinders. While EPA acknowledge there are energy use implications in reclaiming materials, the Agency noted in the draft RIA addendum to the proposed rule a study (Yasaka et al., 2023) [189] that shows, overall, the use of reclaimed refrigerant leads to net reductions in energy compared to the production of virgin material. To be conservative and because these results were based on data from Japan and Europe, EPA does not, however, use those findings to increase the benefits assessed from the avoided emissions estimated based on the requirements of the final rule.

Comment: One commenter suggested that the proposed cylinder management and tracking requirements do not appear to be based on a complete and legally sufficient analysis of the best available data. As such, the commenter stated that that EPA may have significantly overstated the environmental benefits. Another commenter expressed concern that the proposed rule requiring machine readable tracking identifiers on all containers of HFCs that could be used for the servicing, repair, or installation of refrigerant-containing equipment, including both refillable and disposable cylinders, and the requirement to record specific data during the movement of these cylinders will impose significant costs and investment by all industry stakeholders.

Response: EPA responds that it is not finalizing the cylinder tracking requirements at this time, and thus costs and benefits related to those provisions are not included in the RIA addendum and the Economic Impact and Benefits TSD for the final rule. EPA has explained the data used to assess the costs and benefits of the requirement to manage disposable cylinders and send heels to reclaimers in the RIA addendum and the Economic Impact and Benefits TSD. Further, EPA has used information provided by the commenters to perform sensitivity analyses of the Agency's estimate, and notes that in all cases examined, there are environmental benefits, and the savings outweigh the costs even without considering the monetized climate benefits (*i.e.,* even without applying SC–HFC values to the emission reductions). However, as noted previously in this preamble, while EPA included estimates of the costs and benefits of this rulemaking in the RIA addendum to provide the public with information on the relevant costs and benefits of this action and to comply with Executive Orders, the analysis in the RIA addendum does not form a basis or rationale for any of the provisions EPA is promulgating in this rulemaking. Further, although EPA is using the SC–HFCs for purposes of some of the analysis in the RIA addendum, this action does not rely on those estimates of these costs as a record basis for the Agency's action. EPA would reach the conclusions in this rule even in the absence of the SC–HFCs. EPA's reasons

[187] The docket entry for the RIA addendum for the proposed rule is available at: *https://www.regulations.gov/document/EPA-HQ-OAR-2022-0606-0023,* and the Yasaka study is attachment 17.

[188] The docket for materials referenced in the proposed rule is available at: *https://www.regulations.gov/document/EPA-HQ-OAR-2022-0606-0015.*

[189] Yasaka, Yoshihito, et al. "Life-Cycle Assessment of Refrigerants for Air Conditioners Considering Reclamation and Destruction." Sustainability, vol. 15, no.1, 2023, p. 473, doi:10.3390/su15010473.

for establishing the requirements related to disposable cylinders are explained in section IV.G of this preamble.

Comment: Another commenter stated that the container requirements would likely have the greatest impact on the smallest firms in the industry with the fewest resources to spare. The commenter stated that any increased costs associated with the container provisions will ultimately be passed on to consumers, regardless of whether the initial impact is absorbed by contractors or distributors.

Response: In Appendix G of the RIA addendum, EPA performed an assessment under the guidelines of the Small Business Regulatory Enforcement Fairness Act of 1996 and found that the rulemaking can be presumed not to have a significant economic impact on a substantial number of small entities (SISNOSE). Further, to the extent that the comment pertains to the proposed cylinder tracking requirements, EPA notes that it is not finalizing the cylinder tracking requirements at this time.

Comment: One commenter suggested that the implementation of the proposed rule's requirements would unduly burden disadvantaged communities. The commenter stated that it may not be economically viable to retrofit, retire, or replace an existing system to comply with the mandates in the proposed rule due to the complex and integrated nature of grocery store refrigeration systems. The commenter also mentioned that rural and poor communities are more likely to have older stores with older systems that leak at a higher rate than average and with tighter profit margins that make it hard for store owners to pay for extensive repairs, retrofits, or replacements of their refrigeration systems. Additionally, the commenter stated that expenses associated with system maintenance under the proposed requirements would also increase the chances that store owners would be unable to keep less profitable stores open and those stores that remain open would be forced to raise food prices in disadvantaged areas and, in some situations, exacerbate the ''food desert'' problem in certain areas of the country.

The commenter also stated that the proposed requirements to use only reclaimed refrigerants would push additional costs onto the retail food sector which is already struggling due to low profit margins and inflation. The commenter claimed that these high costs may also cause more frequent and longer repairs, which lead to store shutdowns, greater food safety risk, and potential removals of refrigerated sections altogether. The commenter stated that such an increased financial burden will likely impact older stores, and those either owned by or residing in minority and already economically stressed communities.

Another commenter stated that the premature retirement of certain equipment would lead to a disproportionate burden on poorer communities that are unable to replace their equipment. The commenter stated that EPA did not evaluate the implications of this part of its proposed rule on poor communities and users. The commenter further stated that these issues and the environmental burdens caused by disposal of prematurely obsolete equipment should also be considered.

Lastly, a separate commenter stated that EPA must analyze how increased costs on the baking sector and other food production sectors that use refrigeration will contribute to increased food price inflation and basket of goods impacts generally. The commenter stated that EPA must also analyze how these increased cost pressures might impact food prices cumulatively when considered together with what they characterized as other inflationary pressures, such as EPA's biodiesel and renewable diesel mandates under the Renewable Fuel Standard Program (RFS).

Response: EPA recognizes the importance of the food cold chain and food retailers servicing various communities, including avoiding food deserts. However, EPA disagrees that the requirements finalized in this rule will result in undue burden and store closures or the loss of access to food. Store owners may replace broken or inefficient HFC components and save money by repairing leaks in their existing systems. With regard to the comments concerning passing on costs by raising the prices of retail food, EPA reiterates that the overall HFC phasedown will impact the costs of HFC refrigerants in the future. The commenter did not provide detailed information on how specific elements of this rule would result in costs that would be passed on to the consumer and in particular how that would differ from the longstanding ODS requirements or existing HFC requirements. Additionally, some of the requirements in this final rule have been modified from the proposal, and some of those modifications have the effect of easing burden. For example, the requirements for ALD systems include those existing commercial refrigeration equipment with charge sizes of 1,500 pounds or more that were installed on or after January 1, 2017, whereas the proposal included all existing systems with charge sizes of 1,500 pounds or more. Overall, the refrigerant management provisions help to maintain the health of appliances. This can be crucial for refrigerant-containing appliances in the RACHP subsectors that are relevant to handling food products, such as supermarket systems, where the intended function is to ensure food products are maintained at appropriate temperatures to avoid spoilage and food waste. Successful repair of leaks and avoiding leaks are a few ways to help ensure that these appliances are operating efficiently, as intended, and can help to avoid unnecessary food waste.

EPA appreciates concern over food costs; however, with the delayed compliance dates for the reclaim requirements, the Agency anticipates that this will give the market time to adjust to the changes. In the RIA addendum, EPA conservatively assumed that reclaimed refrigerant would cost 10 percent more than virgin refrigerant. Based on consideration of a public comment from a reclaimer stating that virgin and reclaimed refrigerant are the same price, the Agency has also included a sensitivity analysis under that assumption.

In response to the comment on the baking sector, the commenter did not provide sufficient information to support their claims or analyze the specific details of their assertion that the ''rule will contribute to increased food prices and basket of goods impacts, generally.'' Nor is EPA aware of such information or analyses in the record for this rule. EPA estimated the overall costs and benefits of the rule in the RIA addendum and the Economic Impact and Benefits TSD, and to the extent the baking sector is affected by the rule, those estimates include those costs and benefits that will be directed towards that sector. Evaluation of ''other inflationary pressures,'' including the commenters' assertions of such impacts from the Renewable Fuel Standard, is outside of the scope of this rulemaking and so is not included in the RIA addendum or the Economic Impact and Benefits TSD. Moreover, the commenter has not provided any information to indicate that such inflationary pressures would affect this rule differently than the baseline scenarios.

VII. How is EPA considering environmental justice?

As part of the RIA addendum for the final rulemaking, EPA updated the environmental justice analysis that was previously conducted for the proposed

rule. The updated environmental justice analysis utilized the same analytical approach used previously, along with the addition of more reclamation facilities identified since publication of the proposed rule.

Executive Order 14096, signed April 21, 2023, builds on the prior executive orders to further advance environmental justice (88 FR 25251), including Executive Order 12898 (59 FR 7629, February 16, 1994) and Executive Order 14008 (86 FR 7619, January 27, 2021) which establish Federal executive policy on environmental justice.

EPA defines [190] environmental justice as the ''just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people: (i) Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and (ii) have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.'' [191] Meaningful involvement means that: (1) Potentially affected populations have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory Agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the rule-writers and decision-makers seek out and facilitate the involvement of those potentially affected.[192] The term ''disproportionate impacts'' refers to differences in impacts or risks that are extensive enough that they may merit Agency action. In general, the determination of whether there is a disproportionate impact that may merit Agency action is ultimately a policy judgment which, while informed by analysis, is the responsibility of the decision-maker. The terms ''difference'' or ''differential'' indicate an analytically discernible distinction in impacts or risks across population groups. It is the role of the analyst to assess and present differences in anticipated impacts across population groups for both the baseline and regulatory options, using the best available information (both quantitative and qualitative) to inform the decision-maker and the public.[193]

In addition, the Presidential Memorandum on Modernizing Regulatory Review calls for procedures to ''take into account the distributional consequences of regulations, including as part of any quantitative or qualitative analysis of the costs and benefits of regulations, to ensure that regulatory initiatives appropriately benefit, and do not inappropriately burden disadvantaged, vulnerable, or marginalized communities.'' [194] OMB Circular A–4 provides details regarding identifying relevant groups and approaches to analyzing distributional effects.[195] EPA also released its June 2016 ''Technical Guidance for Assessing Environmental Justice in Regulatory Analysis'' (2016 Technical Guidance) to provide recommendations that encourage analysts to conduct the highest quality analysis feasible, recognizing that data limitations, time and resource constraints, and analytic challenges will vary by media and circumstance.[196]

For this action, EPA conducted an environmental justice analysis.[197] For this analysis, EPA used a methodology similar to that used as part of the Allocation Framework Rule (86 FR 55116, October 5, 2021), the 2023 Technology Transitions Rule (88 FR 73174, October 24, 2023), and the proposal of this rule, for consistency and because these rules have in common that they affect the industries involved in using HFCs, although there are some differences in the nature of those effects and the entities affected. The information provided in this section is for informational purposes only; EPA is not relying on the information in this section as a record basis for this action. EPA evaluated communities surrounding the 38 identified HFC reclamation facilities [198] and followed the analytical approach used in the Allocation Framework Rule RIA. This update uses information from the AirToxScreen 2019 dataset.

The analysis shows that communities near the 38 identified HFC reclamation facilities are generally more diverse than the national average with respect to race and ethnicity. While the median income of these communities is slightly higher than the national average, there are more low-income households. Across the 38 facilities, total respiratory risk and total cancer risk are higher than the national average (total cancer risk is between 28 and 29 for the communities near the facilities, compared to 26 for the national average, and total respiratory risk is 0.34 compared to the national average of 0.31). The risk for those closer to the facilities appears slightly lower than for those at greater distances (5- and 10-mile radii).

This rule is expected to result in benefits in the form of reduced GHG emissions. The analysis conducted for this rule also estimates that a portion of these benefits would be incremental to emissions reductions that were anticipated under the Allocation Framework Rule and the 2023 Technology Transitions Rule, thus further reducing the risks of climate change associated with the emissions avoided through this rule.

While providing additional overall climate benefits, this rule may also result in changes in emissions of air pollutants or other chemicals which are potential byproducts of HFC reclamation processes at affected

[190] EPA recognizes that Executive Order 14096 (88 FR 25251, April 21, 2023) provides a new terminology and a new definition for environmental justice. For additional information, see *https://www.federalregister.gov/documents/2023/04/26/2023-08955/revitalizing-our-nations-commitment-to-environmental-justice-for-all.*

[191] See, *e.g.,* Environmental Protection Agency. ''*Environmental Justice.*'' Available at: *https://www.epa.gov/environmentaljustice.*

[192] The criteria for meaningful involvement are contained in EPA's May 2015 document ''*Guidance on Considering Environmental Justice During the Development of an Action.*'' Environmental Protection Agency, 17 Feb. 2017. Available at: *https://www.epa.gov/environmentaljustice/guidance-considering-environmental-justice-during-development-action.*

[193] The definitions and criteria for ''disproportionate impacts,'' ''difference,'' and ''differential'' are contained in EPA's June 2016 document ''Technical Guidance for Assessing Environmental Justice in Regulatory Analysis.'' Available at: *https://www.epa.gov/environmentaljustice/technical-guidance-assessing-environmental-justice-regulatory-analysis.*

[194] Presidential Memorandum on Modernizing Regulatory Review, January 20, 2021. Available at: *https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/modernizing-regulatory-review/.*

[195] Office of Management & Budget, Circular No. A–94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs 17–18, November 9, 2023. Available at: *https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-94.pdf.*

[196] Technical Guidance for Assessing Environmental Justice in Regulatory Analysis, June 2016. Available at: *https://www.epa.gov/sites/default/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf.*

[197] EPA recognizes that new terminology and a new definition for environmental justice were established in Executive Order 14096 (88 FR 25251, April 21, 2023). When the analysis of the proposed rule was performed, EPA was operating under prior guidance available here: *https://www.epa.gov/sites/default/files/2015-06/documents/considering-ej-in-rulemaking-guide-final.pdf.*

[198] As discussed in the RIA addendum, EPA used data from reports required under Section 608 of the Clean Air Act, EPA's Enforcement and Compliance History Online (ECHO) database, and information provided by company websites to identify facilities that are active HFC reclaimers.

facilities. The market for reclaimed HFCs could drive changes in potential risk for communities living near these facilities, but the changes in emissions that could have local effects are uncertain. Further, the nature and location of the emission changes are uncertain. Moreover, there is insufficient information at this time about which facilities will change reclamation processes. Given limited information at this time, it is unclear to what extent this rule will impact existing disproportionate adverse effects on communities living near HFC reclamation facilities.[199] The Agency will continue to evaluate the impacts of this rulemaking on affected communities, including communities with environmental justice concerns, and consider further action, as appropriate, to protect health in communities affected by HFC reclamation.

Comment: One commenter expressed support for EPA's approach on environmental justice and noted that ensuring safety for technicians and consumers will benefit all end users. The commenter noted areas for EPA's consideration regarding impacts on low- and medium-income families in its comments, including allowing some flexibility with retrofit and retirement requirements and considering using some of EPA's budget to fund the purchase of recovery equipment for small contractors serving low- and medium-income communities.

Response: EPA acknowledges the commenter's general support for the approach the Agency has taken for its environmental justice analysis. EPA acknowledges the commenter's suggestion that portions of the Agency budget be redirected to support the purchase of recovery equipment. The Agency notes that to date, funds have not been appropriated for such a purpose. EPA clarifies that leak repair requirements do not apply to residential RACHP equipment, and that EPA is not requiring refrigerant-containing appliances to be retrofitted to a lower-GWP refrigerant.

Comment: One commenter stated that there needs to be greater awareness of the environmental impacts for those who work with HFC refrigerants and to those who advocate for environmental justice.

Response: EPA acknowledges the commenter's support for greater awareness of environmental impacts in this area. EPA notes that the discussion of environmental justice in this action may help increase awareness of these issues.

VIII. How is EPA responding to other comments on the proposed rule?

Comment: One commenter stated there is no authority in the AIM Act (or in the CAA) for mandating facilities install leak detection systems to be used in the normal operation of equipment between servicing. The commenter stated that the Agency's assertion that leak detection is "an activity regarding the servicing or repair of equipment" stretches the actual languages used by Congress beyond their intent and cannot be legally supported. The commenter also mentioned that EPA does not have the authority to penalize facility owners (or equipment owners) for mismanagement of refrigerant resulting from errors made by certified service providers, nor does EPA have the power to regulate loss of refrigerant during normal operations. While the commenter generally agreed with EPA's regulation and best practices for technicians, they claimed the proposed rule does not indicate how that authority extends to the regulation of facility owners. Accordingly, the commenter stated the Agency legally may only require leak detection and prevention during the time that service providers are maintaining refrigeration systems. Further, the commenter stated that EPA has previously recognized that refrigeration equipment will inherently lose refrigerant charge over time and that refrigeration and air conditioning equipment does often leak. If taken to its logical conclusion, the overly broad interpretation of the section 608 rules and the proposed rule to encompass normal operation, in theory, would also extend liability to equipment manufacturers whose appliances would violate the venting prohibition by merely selling equipment into commerce because the equipment might leak and require replacement of refrigerant. Thus, EPA lacks authority to impose liability for normal operation of refrigeration equipment, it cannot impose liability for replacement of refrigerant that is lost routinely during normal operation.

Another commenter stated that EPA should acknowledge that the Agency has no authority under the AIM Act or CAA section 608 to penalize facility or equipment owners for management of refrigerant resulting from errors made by service providers or regulate the loss of refrigerant during normal operations. The commenter cites the use of the term "maintenance" in section 608(c), but not in 608(a), as justification that Congress intended EPA to regulate servicing of equipment by technicians, rather than equipment by facility owners. The commenter further stated that if section 608 is interpreted to encompass normal operation of equipment, an equipment manufacturer would violate the venting prohibition by selling equipment into commerce, because their equipment might leak. Further, the commenter stated that if EPA lacks authority to "impose liability for normal operation of refrigeration equipment" the Agency cannot hold others liable for replacement of refrigerant that is lost in routine operation. The commenter concluded that EPA's authority is limited under section 608 to regulating "intentional or negligent venting" by service providers during servicing, and that the same applies to EPA's authority under the AIM Act.

The commenter claimed that even if EPA could impose penalties for refrigerant release during normal operation, section 608 and subsection (h) do not enable EPA to impose monetary penalties on facilities owners, unless the owner was using its own personnel to service equipment. The commenter cited EPA's prior refrigerant management rule under section 608 as overstepping the Agency's authority to impose the venting prohibition on actions taken over the course of maintaining, servicing, repairing, or disposing of equipment. The commenter further stated that the AIM Act does not give the Agency the authority to regulate facility owners or compel them to install leak detection systems to be used in normal operation of equipment.

Response: With regards to one commenter's assertions that the AIM Act did not give EPA the authority to require facilities to install leak detection systems that would be used in normal operations or authority to regulate owners or operators, the Agency

[199] Statements made in this section on the environmental justice analysis draw support from the following citations: Banzhaf, Spencer, Lala Ma, and Christopher Timmins. 2019. Environmental justice: The economics of race, place, and pollution. Journal of Economic Perspectives; Hernandez-Cortes, D. and Meng, K.C., 2020. Do environmental markets cause environmental injustice? Evidence from California's carbon market (No. w27205). NBER; Hu, L., Montzka, S.A., Miller, B.R., Andrews, A.E., Miller, J.B., Lehman, S.J., Sweeney, C., Miller, S.M., Thoning, K., Siso, C. and Atlas, E.L., 2016. Continued emissions of carbon tetrachloride from the United States nearly two decades after its phaseout for dispersive uses. Proceedings of the National Academy of Sciences; Mansur, E. and Sheriff, G., 2021. On the measurement of environmental inequality: Ranking emissions distributions generated by different policy instruments.; U.S. EPA. 2011. Plan EJ 2014. Washington, DC: U.S. EPA, Office of Environmental Justice.; U.S. EPA. 2015. Guidance on Considering Environmental Justice During the Development of Regulatory Actions. May 2015.; USGCRP. 2016. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC.

disagrees with the commenter's claims. As discussed throughout this notice, subsection (h)(1) directs EPA to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment, for purposes including maximizing reclamation and minimizing the release of HFCs from equipment. As explained elsewhere in this notice, EPA interprets this language to encompass practices, processes, and activities that occur before, during, and after servicing, repair, disposal, or installation of equipment. EPA understands this provision to authorize both the leak repair provisions described in section IV.C and the required use of ALD as described in IV.D because the requirements govern practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment. Determining that equipment is leaking is a critical first step in understanding that it needs servicing or repair, or perhaps to be disposed of and replaced, depending on whether or not the leak can be repaired. The ALD equipment that must be installed and operated under this requirement will inform equipment owners and operators when the equipment is leaking, and EPA expects that this knowledge will lead to earlier repairs, which in turn will prevent releases of HFCs (and potentially costly refrigerant losses). Thus, installing and operating an ALD system is a "process, practice or activity regarding servicing, repair, disposal, or installation of equipment" because taking these steps will alert the equipment owner or operator when servicing or repair of equipment may be required. Accordingly, there is a direct connection between installing and operating the ALD system and servicing or repair (or in some cases, disposal) of equipment.

EPA agrees with the comment that subsection (h) conveys authority to regulate technicians' activities during servicing and repair, but contrary to the commenter's view, nothing in the text of subsection (h) suggests that EPA is precluded from also regulating activities during normal operations that are within the scope of subsection (h) or from regulating equipment owner or operators. Moreover, imposing such restrictions could limit EPA's ability to ensure that the regulations under subsection (h) achieve the stated purposes in the statute because activities that occur during normal operations, or that are taken by equipment owners or operators, will affect efforts to maximize reclamation, minimize releases [200] from equipment, and ensure the safety of technicians and consumers. Further, the statutory phrase for what EPA regulations under (h)(1) may control—"any process, practice or activity *regarding* servicing, repair, disposal, or installation of equipment" (emphasis added)—indicates that Congress did not limit EPA to only regulate processes, practices or activities *during* servicing, repair, disposal, or installation of equipment. Indeed, the authority to regulate to "control . . . activities regarding servicing" includes authority to require that servicing be done, including to address refrigerant losses that occur during normal operation of equipment. Further EPA notes that it considers servicing to include a range of activities involved in preserving equipment in the normal working order, as some form of ongoing and routine servicing is necessary for proper functioning of equipment.

To the extent these comments relate to EPA's regulations under CAA section 608, they are outside the scope of this rulemaking as the Agency did not reopen the section 608 rules as part of this rulemaking and thus require no further response.[201] However, aspects of this rule are analogous to similar EPA rules under CAA section 608, which apply to owners and operators. For example, in the preamble to the 1993 CAA 608 final rule, EPA explained that it had made "additions to the scope section to clarify that the rule covers refrigerant reclaimers, *appliance owners,* and manufacturers of appliances and recycling and recovery equipment in addition to persons servicing, repairing, maintaining, and disposing of appliances." 58 FR 28707 (emphasis added); *see also* 58 FR 28681. EPA explained that the rule required the owner of the equipment to either authorize the repair of substantial leaks or develop the equipment retirement/retrofit plan within 30 days of discovering a leak above the standard and that the owner has the legal obligation to ensure that repairs are made to equipment where the leak rate exceeds the standard. *See* 81 FR 82272. For similar reasons as under section 608, including the role of the equipment owner and operator in determining whether to authorize repair of a leak or whether to retire or retrofit the equipment, this final rule finds it reasonable to include the owners and operators among the regulated entities, consistent with the Agency's practice under the CAA Title VI. EPA has found this approach to be workable, and using the same approach in this final rule should be familiar to entities that have experience implementing the CAA 608 rules, reduce confusion, and facilitate compliance. For this reason, and also given the role of equipment owners and operators in making decisions about the servicing, repair, disposal, and installation of equipment, EPA concludes that it is appropriate to structure the regulations so that equipment owners and operators may be held responsible for certain violations, even if the actions of a technician may play a role in the violation, rather than adopt the commenter's view, which could improperly shield owners and operators from liability even if a decision or action they took resulted in or contributed to the violation. Further, EPA notes that while certain aspects of its experience in implementing certain requirements under CAA section 608 inform this rulemaking and while there are certain analogies between this rule and requirements established under CAA section 608, it has also been clear that AIM subsection (h) and CAA section 608 are separate and distinct statutory authorities, and that this rule is established under AIM subsection (h), such that the text and purposes of that provision govern this action. While there are some similarities in statutory text between AIM subsection (h) and CAA section 608, there are also meaningful differences to consider. Thus, to the extent that commenters suggest that a limitation they perceive in CAA section 608 would also somehow simply apply to EPA's authority under the AIM Act, without further evaluation of the relevant provisions of the AIM Act, EPA disagrees.

EPA disagrees with commenters' assertions that it does not have authority under subsection (h) of the AIM Act to regulate the loss of refrigerant during normal operations or to regulate or penalize facility owners or equipment

[200] The Agency recognizes that refrigerant-containing appliances may lose refrigerant charge over time. However, manufacturers of refrigerant-containing equipment have made great strides in manufacturing equipment less prone to leaks. Nevertheless, refrigerant-containing equipment, especially with larger charge sizes, could leak significant amounts of refrigerant before a leak is detected.

[201] EPA further notes that this comment states that it incorporates by reference prior comments submitted on prior proposed rules under CAA section 608. EPA notes that in order to merit a response, comments on a proposed rule must be stated with specificity, so that the Agency can identify the commenter's concern or requested alteration to the rule at issue. A commenter's statement, such as the statement in this comment, that they are incorporating prior comments or arguments, without any further explanation of how those prior comments or arguments relate to the proposed rule or how the Agency should change its proposal, do not require a response.

operators, including imposing penalties on them for violations of requirements under the AIM Act. Under subsection (h), for purposes including maximizing reclaiming and minimizing the release of a regulated substance from equipment, Congress directed the Administrator to promulgate regulations to control practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance and the reclaiming of a regulated substance used as a refrigerant. As explained in prior sections of this document, establishes regulations that apply to HFCs and or a substitute for an HFC with a GWP greater than 53 to control practices, processes, or activities regarding servicing, repair, disposal, or installation of equipment. Accordingly, the requirements established under this rule are within the scope of EPA's authority under subsection (h). For example, as explained in section IV.C.3 in this notice, EPA is establishing leak repair requirements that control practices, processes, or activities regarding servicing or repair of appliances and that provide persons engaged in such activities with additional clarity and certainty on how to ensure that their actions comport with the requirements established in this action. While many of these requirements regulate the activities of the person working on equipment, *e.g.,* those performing the leak repair, Congress did not limit EPA's authority under (h)(1) to only regulating activities that are performed directly on equipment or only those persons or entities who are directly working on equipment, but rather, as noted previously, authorized EPA to regulate a broader scope of processes, practices or activities *regarding* servicing, repair, disposal, or installation of equipment. EPA interprets the direction under subsection (h)(1) to include authority to regulate equipment owners and operators, as they make decisions and have control over processes, practices or activities regarding servicing, repair, disposal, or installation of equipment, and their decisions and actions will affect efforts to maximize reclamation, minimize releases from equipment and ensure the safety of technicians and consumers. Even if an owner or operator is not using their own personnel to service equipment, their decisions and actions could affect compliance with the requirements under this rule, such as the timing of leak repair activities and the extent to which leaks are repaired.

Further, with respect to EPA's authority to impose penalties on owners and operators, EPA responds that subsection (k)(1)(C) of the AIM Act provides that certain sections of the CAA, including section 113, apply to the AIM Act and any regulations EPA promulgates under the AIM Act as though the AIM Act were part of Title VI of the CAA. Among other things, section 113(a)(3) of the CAA, entitled ''EPA enforcement of other requirements'' authorizes the EPA Administrator to take certain measures if the Administrator ''finds that any person has violated, or is in violation of, any . . . requirement or prohibition of . . . subchapter VI of this chapter, including, but not limited to, a requirement or prohibition of any rule . . . promulgated under [that] subchapter[ ].'' Similarly, the Administrator's enforcement authorities under section 113 of the CAA also include the assessment of monetary civil penalties ''against any person'' if the Administrator finds that ''such person'' has violated or is violating any requirement or prohibition of Title VI of the CAA, ''including, but not limited to, a requirement or prohibition of any rule'' promulgated under Title VI. These provisions apply to the AIM Act and this rule by operation of subsection (k)(1)(C) of the AIM Act. Facility owners or operators are within the broad definition of ''person'' in section 302(e) of the CAA. Accordingly, EPA has authority to enforce the requirements and prohibitions of this rule against facility owners or operators, consistent with section 113 of the CAA. While, as noted previously, this action is separate and distinct from EPA's rules under CAA section 608, EPA further observes that, as described further in section IV.D above, this approach to applying regulatory requirements to owners and operators is similar to and consistent with EPA's approach to requirements in analogous rules under CAA section 608, which also include requirements that apply to owners and operators.

EPA also disagrees with commenters' assertion that EPA does not have authority under subsection (h) of the AIM Act to regulate activities during normal operations. Such restrictions could limit EPA's ability to ensure that the regulations under subsection (h) achieve the stated purposes in the statute because activities that occur during normal operations will affect efforts to maximize reclamation, minimize releases from equipment and ensure the safety of technicians and consumers. Further, the statutory phrase for what EPA regulations under (h)(1) may control—''any process, practice or activity *regarding* servicing, repair, disposal, or installation of equipment'' (emphasis added)—indicates that Congress did not limit EPA to only regulate processes, practices, or activities *during* servicing, repair, disposal, or installation of equipment. Indeed, the authority to regulate to ''control . . . activities regarding servicing [or] repair'' includes authority to require that servicing or repair be done, including to address refrigerant losses that occur during normal operation of equipment. Further EPA notes that it considers servicing to include a range of activities involved in keeping equipment in the normal working order, as some form of ongoing and routine servicing is necessary for proper functioning of equipment.

EPA responds to other comments regarding leak repair in section IV.C above and regarding the use of ALD systems in section IV.D.1 above.

Comment: One commenter questioned EPA's authority to regulate sources on the Outer Continental Shelf (OCS) in the western and central Gulf of Mexico pursuant to 40 CFR part 84, and asked EPA to confirm that OCS sources in those two areas are excluded from the applicability of the proposed regulations in 40 CFR part 84. The commenter stated that 40 CFR part 55 delineates the EPA's air programs applicable to the OCS and that under 40 CFR 55.3(a) the scope of this part extends to all OCS sources except those west of 87.5 degrees longitude. The commenter also claimed that under the Outer Continental Shelf Lands Act (OCSLA) the Department of the Interior (DOI) has the authority to administer programs and rules relating to the OCS, including those related to air quality, and asserted that that authority is not shared with EPA, citing *California* v. *Kleppe,* 604 F.2d 1187, 1193 (9th Cir. 1979). The commenter further stated that section 328 of the CAA sets EPA's regulatory authority in the OCS, limiting that authority to sources east of longitude 87 degrees 30 minutes. The commenter stated that the intent of the AIM Act and the proposed rule were to regulate air quality and emissions related to HFCs and concluded that there is overlap between EPA's authority under the AIM Act and the DOI's authority. The commenter stated that EPA's proposed regulations to track, record, and provide information regarding the sale and distribution of HFCs are ''similar to requirements in 43 U.S.C. [section] 1348(b)(3) for lease and permit holders to provide 'documents and records which are pertinent to . . . environmental protection, as may be

requested' under OCSLA." [202] The commenter further stated that AIM Act subsection (h) provides EPA broad authority to promulgate regulations but that "the AIM Act is silent on the question of OCS sources and in (k)(1)(C) expressly applies sections of title VI of the CAA to EPA's authority" in the proposed regulations. The commenter further stated that the AIM Act "does not alter the existing division of jurisdiction between the EPA and DOI with regard to air quality regulations applicable to OCS sources" and that, "[a]ccordingly, . . . 40 CFR part 84 is not applicable to the western and central [Gulf of Mexico]," [203] and the regulation of sale and distribution of HFCs does not extend to those areas without a grant of similar authority to the DOI and the Bureau of Ocean Energy Management (BOEM) under the AIM Act. The commenter acknowledged that 40 CFR part 84 would apply to the eastern Gulf of Mexico, given that BOEM has not been delegated authority over air quality in this specific area.

Response: EPA disagrees with the commenter's broad assertions that EPA does not have authority under the AIM Act to issue regulations pertaining to HFCs and their substitutes related to offshore operations in the western and central Gulf of Mexico. EPA also disagrees with the commenter's assertions that the regulations finalized in this action under subsection (h) of the AIM Act are not applicable in the western and central Gulf of Mexico and that OCS sources situated in the western and central Gulf of Mexico are excluded from these regulations. The commenter cites *California* v. *Kleppe,* 604 F.2d 1187, 1193–94 (9th Cir. 1979) ("*Kleppe*") for the proposition that DOI has "sole" authority to promulgate air quality regulations for OCS sources, which is not shared with EPA. But *Kleppe* addresses DOI's authorities over offshore activities as those authorities existed in 1979, long before both the 1990 Amendments to the CAA, which authorized EPA to regulate air emissions from OCS sources (42 U.S.C. 7627, Pub. L. 101–549, Title VIII, Sec. 801 ("OCS air pollution"), November 15, 1990), and Congress's 2020 enactment of the AIM Act, which authorized EPA to promulgate regulations to address HFCs (42 U.S.C. 7675, Pub. L. 116–260, Division S, Sec. 103 ("American Innovation and Manufacturing"), December 27, 2020). *Kleppe* therefore does not speak to EPA's current authorities under either the CAA or the AIM Act. Additionally, while the commenter states that aspects of this rule are "similar to" DOI's authorities to seek records and documents under OCSLA, it fails to identify any conflict between these requirements or to provide any other support for a conclusion that the relevant provisions cannot all be given effect.

This rule implements Congress's direction in subsection (h)(1) of the AIM Act for EPA to establish regulations "to control, where appropriate, any practice, process or activity regarding the servicing, repair, disposal, or installation of equipment" that involves an HFC or a substitute for an HFC, or the reclaiming of an HFC or a substitute for an HFC used as a refrigerant, for purposes of maximizing reclamation, minimizing releases of HFCs from equipment, and ensuring the safety of technicians and consumers. The AIM Act, which was enacted separately from the CAA, does not exclude any geographic area within the United States from the scope of EPA's authorities under in the Act. In fact, certain provisions of the Act clearly indicate that the Act applies throughout the United States. For example, subsection (b)(6) of the AIM Act defines the term "import" to mean "to land on, bring into, or introduce into, or attempt to land on, bring into, or introduce into, any place subject to the jurisdiction of the United States."

The commenters cite certain geographic restrictions on EPA's authority to regulate air pollution from OCS sources under CAA section 328 and EPA's implementing regulations in 40 CFR part 55, suggesting that EPA's regulatory authority over emissions sources in the Gulf of Mexico is limited to "sources east of longitude 87 degrees 30 minutes" (or 87.5 degrees longitude) under these statutory and regulatory provisions. Section 328 of the CAA, however, pertains only to EPA's authorities under the CAA with respect to "OCS sources" and has no bearing on EPA's independent authorities under the AIM Act and other Federal statutes. In addition to the AIM Act, which, by its terms, applies to activities such as production and consumption of HFCs, restrictions on use of HFCs in the sectors or subsectors in which they are used, and practices, processes, or activities regarding servicing, repair, disposal, or installation of equipment that involves an HFC or a substitute for an HFC, or the reclaiming of an HFC or a substitute for an HFC used as a refrigerant, the Deepwater Port Act directs that Federal laws apply to deepwater ports "and to activities connected, associated, or potentially interfering with the use or operation of any such port, in the same manner as if such port were an area of exclusive Federal jurisdiction located within a State. . . ." 33 U.S.C. 1518(a)(1). Thus, any deepwater port or associated activity that would be subject to the AIM Act if located onshore remains subject to these requirements offshore, both in the Gulf of Mexico and in other waters over the OCS. The requirements of the AIM Act, the Deepwater Port Act, and other Federal laws apply by their terms to sources located offshore, independent of the authorities and limitations specified in CAA section 328 with respect to OCS sources.

The commenter's reference to section (k)(1)(C) of the AIM Act provides no support for a claim that EPA's authorities under the AIM Act are limited by CAA section 328. Section (k)(1)(C) of the AIM Act states that "sections 113, 114, 304, and 307 of the Clean Air Act (42 U.S.C. 7413, 7414, 7604, 7607) shall apply" to the AIM Act and any regulations EPA promulgates under the AIM Act as though the AIM Act were part of Title VI of the CAA. These provisions of the CAA pertain to Federal and citizen enforcement, EPA's information-gathering authorities, and judicial review of EPA's actions under the CAA. By directing that these provisions apply to the AIM Act and any implementing regulations promulgated by EPA to implement the AIM Act, Congress provided EPA and citizens with the same enforcement and information-gathering authorities that the CAA provides and vested the United States Courts of Appeals with jurisdiction to review challenges to EPA's final actions under the AIM Act, in the same manner as under the CAA. CAA section 328 (42 U.S.C. 7627), by contrast, authorizes EPA to "establish requirements to control air pollution from Outer Continental Shelf sources" in specific offshore areas. Section 328 is not included among the CAA provisions expressly identified in section (k)(1)(C) of the AIM Act, and there is no indication in either the CAA or the AIM Act that Congress intended for EPA's regulatory authorities with respect to OCS sources under CAA section 328 to apply to or limit its authorities with respect to HFCs or HFC substitutes under the AIM Act.

The AIM Act itself creates no exemption for emissions sources in the western and central Gulf of Mexico from its requirements. Establishing an exemption from the requirements of this rule for sources in the western and central Gulf of Mexico could create an unequal framework rather than fairly

[202] See comment number EPA–HQ–OAR–2022–0606–0098 at 2.

[203] See comment number EPA–HQ–OAR–2022–0606–0098 at 2–3.

applying regulations under the AIM Act subsection (h) to similarly situated sources, including those in the eastern Gulf of Mexico, which the commenter concedes would be subject to these rules.

EPA further notes that this ER&R rule implements provisions under subsection (h) of the AIM Act. To the extent this comment relates to the application of EPA's rules under CAA Title VI or other particular aspects of the AIM Act or regulations under Part 84, those topics are beyond the scope of this rulemaking and thus require no further response.

Regarding the commenter's statement about the tracking, recordkeeping, and reporting of information regarding sale and distribution of HFCs, as noted previously in this preamble, EPA is not finalizing the proposed provisions for container tracking of HFCs that could be used in the servicing, repair, and/or installation of refrigerant-containing or fire suppression equipment. Thus, any concerns pertaining to that aspect of the proposal are not relevant to this action. However, EPA is establishing a discrete reporting requirement to better understand the use of reclaimed HFCs in the subsectors covered in this rulemaking, as described in section IV.E.2 above. EPA additionally notes that the other recordkeeping and reporting provisions established under this rule provide no exemption for offshore sources, and remain applicable by their terms, consistent with the discussion earlier in this response to comment."

Comment: One commenter stated that EPA's statutory authority and specific legislative guidance indicated the importance of interpreting similar authorities to avoid unreasonable outcomes and thus understood subsection (h)(2) to mean that in developing regulations for equipment servicing, repair, disposal, or installation "EPA should prioritize, and may only have the authority to prioritize, the exploration of opportunities for refrigerant reclamation." The commenter stated that this interpretation aligns with the Agency's mission and ensures a responsible and sustainable approach to refrigerant management, while ensuring that there is adequate access to refrigerant supply to meet demand.

Response: EPA disagrees with the commenter's interpretation of subsection (h)(2). Subsection (h)(1) of the AIM Act provides EPA authority to promulgate regulations to control, where appropriate, any practice, process, or activity regarding the servicing, repair, disposal, or installation of equipment that involves HFCs or their substitutes, or the reclaiming of HFCs or their substitutes used as refrigerants. Subsection (h)(2)(A) of the Act provides that the Administrator "shall consider the use of authority available . . . under this section to increase opportunities for the reclaiming of regulated substances used as refrigerants." Subsection (h)(2)(B) of the Act provides that a "regulated substance used as a refrigerant that is recovered shall be reclaimed before the regulated substance is sold or transferred to a new owner, except where the recovered regulated substance is sold or transferred to a new owner solely for the purposes of being reclaimed or destroyed." While subsection (h)(2)(A) requires that the Agency consider the potential to increase opportunities for reclamation of regulated substances used as refrigerants, nothing in this statutory language limits the use of EPA's authorities for other purposes or requires that the Agency reach a certain result based on such consideration. Nothing in the text of either subsection (h)(2)(A) or (B) suggests that it is intended to modify the grant of regulatory authority in subsection (h)(1) or dictate the Agency's priorities in implementing subsection (h)(1). Further, such an interpretation of subsection (h)(2) could unduly restrict EPA's ability to fully implement the regulatory authority granted in subsection (h)(1), for example in promulgating regulations consistent with that provision that are focused on the purposes identified in subsection (h)(1) of minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers. Notwithstanding EPA's disagreement with the commenters' interpretation of (h)(2), the Agency notes it has considered various uses of its authority in this rulemaking that could increase opportunities for reclamation of HFCs used as refrigerants and that several aspects of this final rule that are focused on maximizing reclamation of HFCs could also increase opportunities for reclamation.

Comment: Many commenters expressed support for the development of new requirements for technician training and certification. Some commenters also expressed support for continuing education requirements, recertification requirements, and developing new requirements for already certified technicians. Other commenters expressed support for new requirements for technicians obtaining certifications for the first time but opposed requirements for already certified technicians. Some commenters stated that requirements for technician training and certification would ensure that technicians are up to date relative to changes in the industry, are properly trained for the installation and servicing of equipment, can handle flammability and safety concerns such as those associated with new refrigerants, and are aware of regulatory requirements related to HFCs such as the prohibition on venting. Some commenters also stated that technician and certification requirements would encourage recovery and reclamation, protect facility owners and operators, reduce emissions, ensure a smooth transition, promote adoption of new refrigerants, change the culture in the industry to reinforce the use of proper methods, and enhance compliance. Some commenters mentioned that current requirements are inadequate to ensure that HFCs are managed correctly.

Other commenters expressed opposition to the development of new requirements for technician training and certification. Some commenters stated that such requirements would add compliance burdens without environmental and safety benefits, that such requirements would exceed EPA's authority, that technicians do not want to be forced to take a test, that certain entities would profit off of the certification requirements, that requirements would impose added costs on technicians, that requirements would dissuade potential HVAC professionals from entering the industry, that existing government and industry requirements are sufficient, and that already certified technicians should not be subject to new requirements. One commenter suggested that EPA encourage but not mandate training and certification, and another commenter expressed openness to more training but opposed any more EPA requirements.

Response: EPA acknowledges these comments. As discussed in section I.B above in this action, EPA also issued in conjunction with the proposed rule an ANPRM seeking information on approaches for establishing requirements for technician training and/or certification. EPA explained in that notice that it was not proposing and will not be finalizing a technician training and certifying program on which it sought advance comment. Accordingly, EPA explained that the Agency did not intend to respond to any advance information received. However, EPA intends to consider those comments as part of a potential future notice and comment rulemaking to establish a training and/or certification program. Therefore, EPA is not

addressing technician training in this final rulemaking and accordingly is not responding to comments on the ANPRM in this action. However, EPA is establishing requirements for fire suppression technician training, as described in section IV.F.2.d.

Comment: One commenter asserted that EPA must take additional steps, on its own and in conjunction with other Federal agencies, to level the playing field for reclaimers. For example, the commenter stated that EPA should revise its implementation of the SNAP program to curtail patent or contractual limitations on reclamation. Among other comments related to the Allocation Program, the commenter stated that EPA should use administrative consequences in additional scenarios including to entities engaged in market manipulation, patent misconduct, and ''unfair trade practices'' and that all allowances revoked pursuant to administrative consequences should be reallocated to EPA-certified reclaimers. Additionally, the commenter stated that EPA should change the provision in the Framework Allocation Rule allowing HFCs contained in equipment to be imported without expending allowances. The commenter further stated that EPA should assign a GWP value of zero to all refrigerants reclaimed in the U.S. by EPA-certified reclaimers, establish a ''life-cycle adjusted GWP'' value for all refrigerants to reflect their actual reclaim rate, and use that adjusted GWP value for purposes of all AIM Act regulatory programs, as well as establish a recycle or release rate for every SNAP-approved product. The commenter also recommended that EPA develop a rule providing that refrigerants that do not meet a 15% reclaim rate could be designated as unacceptable substitutes under SNAP.

The commenter further suggested that EPA should require all recovered refrigerant to be exclusively returned to EPA-certified reclaimers and should update the certification requirements for reclaimers. The commenter also stated that EPA should establish a mechanism for reclaimers or third parties to seek EPA intervention to prevent or call attention to anticompetitive practices that harm the reclaim market. The commenter further recommended that EPA should create a unified reporting portal for EPA-certified reclaimers. The commenter asserted that EPA should enhance its engagement with DOC and U.S. Customs and Border Protection to address anticompetitive behavior by virgin refrigerant producers and ensure a level playing field, especially regarding antidumping and countervailing duties and the 2016 Blends Order. Finally, the commenter suggested that State and local government agencies and regulatory bodies consider imposing fees on all newly manufactured HFC/HFO refrigerant products and stated that EPA should support this effort.

Response: Regarding the commenter's points on patent or contractual limitations on reclamation, providing mechanisms for reclaimers related to anticompetitive practices, implementation of the SNAP program, and requested listings as unacceptable under EPA's SNAP program, these comments are outside the scope of this final rule promulgated under the AIM Act and thus require no further response. The commenter's suggestions for changes to the administrative consequences under the Allocation Program as well as the requested changes to the regulations established by the Framework Allocation Rule and codified at 40 CFR part 84, subpart A are also outside the scope of this final rule and thus require no further response. Regarding commenter's points regarding assigned GWP values, EPA responds that subsection (c) of the AIM Act uses exchange values which are numerically equivalent to the 100-year GWP of the chemical as given in the Errata to Table 2.14 of the IPCC's 2007 Fourth Assessment Report. These exchange values are codified in EPA's regulations as appendix A to 40 CFR part 84, and this rulemaking did not propose, and is not finalizing, new or revised exchange values for any regulated substances. By their terms, the exchange values listed in subsection (c) of the AIM Act and codified at appendix A to 40 CFR part 84 apply to regulated substances regardless of whether the substance is newly manufactured or reclaimed, and they are based on physical properties of the compound itself that are the same for a substance, regardless of whether it is virgin or reclaimed. Further, to the extent that commenters on this rule are using terminology that is used under the Allowance Allocation Program in ways that diverge from how the Agency uses those terms or seeking modifications to requirements under that program, EPA is not making any changes to the Allowance Allocation Program in this rule. Under the regulations at 40 CFR 84.5(b)(1) the quantity of consumption allowances that must be expended for an import of a regulated substance must be equal to the exchange-value weighted equivalent of the regulated substances imported. EPA is not changing that requirement for any regulated substance in this rulemaking.

Regarding comments recommending that EPA should require that all recovered refrigerant be exclusively returned to EPA-certified reclaimers, there may be instances where this may not be appropriate or practical (*e.g.,* the same owner recovers refrigerant and transfers to another location). EPA is, however, requiring that disposable cylinders that were used in the servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment be sent to a reclaimer, fire suppression recycler, final processor for removal of the heel as discussed in section IV.G.1. Further, as discussed in section IV.E.1 above, EPA is also establishing labeling and recordkeeping requirements, as proposed, and prohibiting the sale, identification, or reporting of refrigerant as being reclaimed if the HFC component of the resulting refrigerant contains more than 15 percent, by weight, of virgin HFC. EPA proposed and is requiring that certified reclaimers affix this label to reclaimed HFCs being sold or distributed or offered for sale or distribution beginning January 1, 2026. EPA also proposed and is finalizing that beginning January 1, 2026, certified reclaimers generate a record to certify that the reclaimed refrigerant does not exceed 15 percent, by weight, of virgin HFCs. Such records must be maintained for three years.

IX. Judicial Review

The AIM Act regulations promulgated herein may be challenged in the United States Court of Appeals for the District of Columbia Circuit. Pursuant to section 307(b)(1) of the CAA, petitions for judicial review of the AIM Act regulations must be filed in that court within 60 days after the date notice of this final action is published in the **Federal Register**. Any person seeking to challenge both the AIM Act regulations and the RCRA regulations must file the challenge to the AIM Act regulations within 60 days after the date notice of this final action is published in the **Federal Register**.

The AIM Act provides that certain sections of the CAA ''shall apply to'' the AIM Act and to ''any rule, rulemaking, or regulation promulgated by the Administrator of [EPA] pursuant to [the AIM Act] as though [the AIM Act] were expressly included in title VI of [the CAA]'' (42 U.S.C. 7675(k)(1)(C)). Among the applicable sections of the CAA is section 307, which includes provisions on judicial review. Section 307(b)(1) provides, in part, that petitions for review must be filed in the United

States Court of Appeals for the District of Columbia Circuit: (i) When the Agency action consists of ''nationally applicable regulations promulgated, or final action taken, by the Administrator,'' or (ii) when such action is locally or regionally applicable, but such action is ''based on a determination of nationwide scope or effect.''

The AIM Act regulations promulgated herein are ''nationally applicable regulations'' within the meaning of CAA section 307(b)(1). These regulations define and interpret terms under the AIM Act and establish regulatory requirements applicable across the entire United States to implement subsection (h) of the AIM Act, including requirements to control practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment that involves a regulated substance, a substitute for a regulated substance, the reclaiming of a regulated substance used as a refrigerant, or the reclaiming of a substitute for a regulated substance used as a refrigerant, as well as regulatory requirements for labeling, recordkeeping, and reporting, for purposes including maximizing reclamation and minimizing releases of regulated substances from equipment. Accordingly, under section 307(b)(1) of the CAA, petitions for judicial review of these AIM Act regulations must be filed in the United States Court of Appeals for the District of Columbia by December 10, 2024.

EPA's RCRA regulations promulgated herein may be challenged in the United States Court of Appeals for the District of Columbia Circuit. Section 7006(a)(1) of RCRA provides that ''a petition for review of action of the Administrator in promulgating any regulation, or requirement under this chapter . . . may be filed only in the United States Court of Appeals for the District of Columbia, and such petition shall be filed within ninety days from the date of such promulgation . . . .'' Accordingly, petitions for judicial review of the RCRA regulations promulgated herein must be filed in the United States Court of Appeals for the District of Columbia by January 9, 2025. Any person seeking to challenge both the AIM Act regulations and the RCRA regulations must file the challenge to the RCRA regulations within 90 days after the date notice of this final action is published in the **Federal Register**.

X. Severability

As noted previously, in this **Federal Register** notice we are providing notice of two sets of regulations: one under the AIM Act and another under RCRA. Accordingly, as explained in the proposal and in other sections of this notice, as well as in the following paragraphs for clarity, this notice of final rulemaking is multifaceted and addresses many separate issues for independent reasons. For example, the AIM Act regulations include definitions and interpretations of terms under the AIM Act; new requirements, including provisions that address maximizing the reclamation and minimizing the release of HFCs from equipment under subsection (h) of that Act; and labeling, recordkeeping, and reporting requirements to support the enforcement of the new provisions. EPA has separately considered and adopted the elements of the AIM Act regulations, including leak repair of refrigerant-containing appliances; reclaimed HFCs for the servicing and/or repair of certain refrigerant-containing equipment; recycled HFCs in fire suppression equipment; emissions reductions in the fire suppression sector; and removal of HFCs from disposable cylinders before discarding them. Each of these requirements is supported by a separate analysis and rationale, based on independent consideration of issues such as the particular processes, practices, or activities that are relevant to and controlled by the requirement and how the requirements relate to the purposes identified in subsection (h)(1). These requirements also address different sectors and subsectors (RACHP and fire suppression). EPA intends for requirements for each of these topics to be able to stand independently from one another and has designed them accordingly. For example, the leak repair requirements for refrigerant-containing appliances are designed to operate independently from the requirements for servicing, repair, disposal, or installation of fire suppression equipment, as they address different types of equipment and are each independently intended to further serve the purposes of maximizing the reclamation and minimizing the release of HFCs from equipment. Similarly, while the requirements for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs and the requirements for recycled HFCs in the fire suppression sector also serve those same purposes, they do so by addressing processes, practices, or activities regarding the servicing, repair, installation, or disposal of equipment that differ both from those addressed by the leak repair requirements for refrigerant-containing appliances and those addressed by the emissions reductions requirements for fire suppression equipment, as well as from one another. Likewise, while the requirements for removal of HFCs from disposable cylinders also help serve the purpose of maximizing reclamation, this portion of the AIM Act regulations is not integral to the adoption of the standards for what constitutes reclaimed HFC refrigerant, requirements for the servicing and/or repair of certain refrigerant-containing equipment with reclaimed HFCs, or other requirements.

In this notice of final rulemaking, EPA is also amending regulations under RCRA, which are separate from the regulations under subsection (h)(1) of the AIM Act, to establish alternative standards for ignitable spent refrigerants when recycled for reuse, as the term ''recycle'' is to be used under RCRA. These standards are established under a different set of statutory authorities than the AIM Act regulations, and they are part of an independent and distinct regulatory regime. While we intend for the AIM Act regulations and the separate RCRA regulations described in this notice of final rulemaking to operate independently of one another and to be severable from each other, we are providing notice of both sets of regulations simultaneously because both the RCRA regulations concerning the recovery and recycling of certain ignitable spent refrigerants and the AIM Act regulations concerning recovery and reclamation of refrigerants may be of interest to some of the same stakeholders.

Thus, EPA has independently considered and adopted the RCRA regulations (including the element for the RCRA alternative standards for ignitable spent refrigerants when recycled for reuse) and the AIM Act regulations (including but not limited to the elements of the ER&R program related to leak repair of refrigerant-containing appliances; reclaimed HFCs for the servicing and/or repair of certain refrigerant-containing equipment; recycled HFCs in fire suppression equipment; emissions reductions in the fire suppression sector; and removal of HFCs from disposable cylinders before discarding them), and these elements of these regulations are severable from the others. If a court were to invalidate any one of these elements, EPA intends the remainder of the provisions to remain effective, as the Agency has designed the elements of both the AIM Act regulations and the RCRA regulations to function sensibly and separately, and finds each portion appropriate, even if one or more other provisions has been set aside. Moreover, this discussion is not intended to be exhaustive, and

should not be viewed as an intention by EPA to consider other requirements not explicitly listed here as not severable from other requirements.

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 14094: Modernizing Regulatory Review

This action is a ''significant regulatory action'', as defined under section 3(f)(1) of Executive Order 12866, as amended by Executive Order 14094. Accordingly, EPA submitted this action to the OMB for Executive Order 12866 review. Documentation of any changes made in response to the Executive Order 12866 review is available in the docket. EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, *Final Regulatory Impact Analysis Addendum: Analysis of the Economic Impact and Benefits of the Proposed Rule: American Innovation and Manufacturing (AIM) Act Subsection H Management of Regulated Substances* (Docket Number EPA–HQ–OAR–2022–0606), is also available in the docket and is summarized in section I.C and section VI of this preamble. Estimated costs, benefits, and resulting net benefits are provided by type of provision in table 10 below.

TABLE 10—SUMMARY OF PRESENT VALUE COSTS, BENEFITS, AND NET BENEFITS BY REGULATORY PROVISION (MILLIONS OF 2022$, DISCOUNTED TO 2024)—BASE CASE SCENARIO

Provision	Climate benefits (3%)	Costs (savings) (2%)	Costs (savings) (3%)	Costs (savings) (7%)	Net benefits (3% benefits, 2% costs)	Net benefits (3% benefits, 3% costs)	Net benefits (3% benefits, 7% costs)
Leak Repair And ALD	$6,176	$1,285	$1,146	$760	$4,891	$5,031	$5,417.
Fire Suppression	14	$15	$13	$7	($1)	$1	$7.
Cylinder Management	2,165	($195)	($169)	($101)	$2,360	$2,335	$2,266.
Use of Reclaimed HFCs for Servicing [a].		$43	$38	$23	($43)	($38)	($23).
Recordkeeping & Reporting		$350	$308	$195	($350)	($308)	($195).
Total (AIM Act) [b]	8,356	$1,499	$1,335	$884	$6,857	$7,021	$7,471.
RCRA Alternative Standard Requirements [c].		$0 to ($40)	$0 to ($35)	$0 to ($22)	$0 to ($40)	$0 to ($35)	$0 to ($22).
Total (AIM Act + RCRA) [b]		$1,459 to $1,499	$1,300 to $1,335	$863 to $884	$6,857 to $6,897	$7,021 to $7,056	$7,471 to $7,493.

[a] As detailed in the RIA addendum, reclaim requirements may lead to additional emissions reductions by inducing increased recovery of refrigerant at servicing and disposal that may otherwise be released or vented. In the base case scenario, EPA does not estimate an increase in these avoided emissions beyond baseline assumptions. See the RIA addendum for additional analysis related to this assumption.

[b] Rows may not appear to add correctly due to rounding.

[c] RCRA alternative standard requirements are part of the RCRA regulations, which are separate from the regulations under subsection (h)(1) of the AIM Act. Potential RCRA-related benefits presented in this table are included here for informational purposes.

B. Paperwork Reduction Act (PRA)

The information collection activities in this rule have been submitted for approval to the OMB under the PRA. The ICR document that EPA prepared has been assigned EPA ICR number 2778.02. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

Subsection (k)(1)(C) of the AIM Act states that section 114 of the CAA applies to the AIM Act and rules promulgated under it as if the AIM Act were included in title VI of the CAA. Thus, section 114 of the CAA, which provides authority to the EPA Administrator to require recordkeeping and reporting in carrying out provisions of the CAA, also applies to and supports this rulemaking.

EPA is establishing certain labeling requirements for containers of reclaimed HFCs. EPA is also establishing recordkeeping and reporting requirements for owners or operators of applicable refrigerant-containing appliances that contain HFCs or certain substitutes for HFCs to support compliance with the leak repair provisions, as well as recordkeeping and reporting requirements for the fire suppression provisions for HFCs. Additionally, where ALD systems are required, EPA is establishing that owners or operators maintain records regarding the annual calibration or audit of the system.

Respondents/affected entities: Respondents and affected entities will be individuals or companies that own, operate, service, repair, recycle, dispose, or install equipment containing HFCs or their substitutes addressed by this final rule, as well as individuals or companies that recover, recycle, or reclaim HFCs or such substitutes.

Respondent's obligation to respond: Mandatory (AIM Act and section 114 of the CAA).

Estimated number of respondents: 781,563.

Frequency of response: Quarterly, annually, and as needed depending on the nature of the report.

Total estimated burden: 222,268 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $17,069,893 (per year), includes $0 annualized capital or operation & maintenance costs. This includes $2,131,844 avoided per year for reclamation reporting and recordkeeping related to the RCRA alternative standards.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in title 40 of the CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities (SISNOSE) under the RFA. The small entities subject to the requirements of this action include those that may use as refrigerant, use as a fire suppression agent, reclaim, or recycle HFCs. EPA estimates that approximately 493 of the 767,568 potentially affected small entities (~0.06%) could incur costs in excess of one percent of annual sales/revenue and that approximately 12

small entities (<0.01%) could incur costs in excess of three percent of annual sales/revenue. Because there is not a substantial number of small entities that may experience a significant impact, it can be presumed that this action will have no SISNOSE. Details of this analysis are presented in the Economic Impact and Benefits TSD. (Docket ID EPA–HQ–OAR–2022–0606).

D. 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.

E. 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.

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

This action does not have Tribal implications as specified in Executive Order 13175. It will not have substantial direct effects on Tribal governments, on the relationship between the Federal government and Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian Tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this action. EPA periodically updates Tribal officials on air regulations through the monthly meetings of the National Tribal Air Association and will share information on this rulemaking through this and other fora.

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

Executive Order 13045 directs federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. This action is subject to Executive Order 13045 because it is a significant regulatory action under section 3(f)(1) of Executive Order 12866, and EPA contends that the environmental health or safety risk addressed by this action has a disproportionate effect on children. Accordingly, the Agency has evaluated the environmental health or safety effects of climate change on children.

Greenhouse gases, including HFCs, contribute to climate change. Certain populations and life stages, including children, the elderly, and the poor, are most vulnerable to climate-related health effects. The results of this evaluation are contained in the assessment literature cited in EPA's 2009 and 2016 Endangerment Findings. The assessment literature since 2016 strengthens these conclusions by providing more detailed findings regarding these groups' vulnerabilities and the projected impacts they may experience.

This action is preferred over other regulatory options analyzed because the GHG emissions reductions resulting from implementation of this rule will further reduce risks to children's health associated with the avoided emissions. These assessments describe how children's unique physiological and developmental factors contribute to making them particularly vulnerable to climate change. Impacts to children are expected from heat waves, air pollution, infectious and waterborne illnesses, and mental health effects resulting from extreme weather events. In addition, children are among those especially susceptible to most allergic diseases, as well as health effects associated with heat waves, storms, and floods. Additional health concerns may arise in low-income households, especially those with children, if climate change reduces food availability and increases prices, leading to food insecurity within households.

More detailed information on the impacts of climate change to human health and welfare is provided in section III.B of this preamble.

H. Executive Order 13211: Actions 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 applies to certain regulated substances and certain equipment containing regulated substances or certain substitutes for regulated substances, none of which are used to supply or distribute energy.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

The human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with environmental justice concerns. EPA carefully evaluated available information on HFC reclamation facilities and the characteristics of nearby communities to evaluate these impacts in the context of this final rulemaking. Based on this analysis, EPA finds evidence of environmental justice concerns near HFC reclamation facilities from cumulative exposure to existing environmental hazards in these communities.

The analysis shows that communities near the 38 identified HFC reclamation facilities are generally more diverse than the national average with respect to race and ethnicity. While the median income of these communities is slightly higher than the national average, there are more low-income households. Across the 38 facilities, total respiratory risk and total cancer risk are slightly elevated compared to the national average.

This rule is expected to result in benefits in the form of reduced GHG emissions. The analysis conducted for this rule also estimates that a portion of these benefits would be incremental to emissions reductions that were anticipated under the Allocation Framework Rule alone, thus further reducing the risks of climate change associated with those emissions.

It is not practicable to assess whether this action is likely to result in new disproportionate and adverse effects on communities with environmental justice concerns. While providing additional overall climate benefits, this rule may also result in changes in emissions of air pollutants or other chemicals that are potential byproducts of HFC reclamation processes at affected facilities. The market for reclaimed HFCs could drive changes in potential risk for communities living near these facilities due to the changes in emissions that could have local effects is uncertain. However, the nature and location of the emission changes are uncertain. Moreover, there is insufficient information at this time about which facilities will change reclamation processes. Given limited

information at this time, it is unclear to what extent this rule will impact existing disproportionate adverse effects on communities living near HFC reclamation facilities. The Agency will continue to evaluate the impacts of this rulemaking on affected communities, including communities with environmental justice concerns, and consider further action, as appropriate, to protect health in communities affected by HFC reclamation. The information supporting this Executive Order review is contained in section VII of this preamble.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action meets the criteria set forth in 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 84

Environmental protection, Administrative practice and procedure, Air pollution control, Chemicals, Climate change, Emissions, Reclaiming, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 261

Environmental protection, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 262

Environmental protection, Exports, Hazardous materials transportation, Hazardous waste, Imports, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

40 CFR Part 266

Environmental protection, Energy, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 270

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous materials transportation, Hazardous waste, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 271

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous materials transportation, Hazardous waste, Indians—lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control, Water supply.

Michael S. Regan,

Administrator.

For the reasons stated in the preamble, EPA amends 40 CFR parts 84, 261, 262, 266, 270, and 271 as follows:

PART 84—PHASEDOWN OF HYDROFLUOROCARBONS

■ 1. The authority citation for part 84 continues to read as follows:

Authority: Pub. L. 116–260, Division S, Sec. 103.

■ 2. Add subpart C, consisting of §§ 84.100 through 84.120, to read as follows:

Subpart C—Management of Regulated Substances

Sec.

84.100 Purpose.
84.102 Definitions.
84.104 Prohibitions.
84.106 Leak repair.
84.108 Automatic leak detection systems.
84.110 Emissions from fire suppression equipment.
84.112 Reclamation.
84.114 Exemptions.
84.116 Requirements for disposable cylinders.
84.118 Treatment of data submitted under 40 CFR part 84, subpart C.
84.120 Relationship to other laws.

§ 84.100 Purpose.

The purpose of the regulations in this subpart is to implement subsection (h) of 42 U.S.C. 7675, including with respect to establishing requirements to control practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment, for purposes of maximizing reclaiming, minimizing the release of regulated substances from equipment, and ensuring the safety of technicians and consumers.

§ 84.102 Definitions.

For the terms not defined in this subpart but that are defined in § 84.3, the definitions in § 84.3 shall apply. For the purposes of this subpart C:

Certified technician means a technician that has been certified per the provisions at 40 CFR 82.161.

Comfort cooling means the refrigerant-containing appliances used for air conditioning to provide cooling in order to control heat and/or humidity in occupied facilities including but not limited to residential, office, and commercial buildings. Comfort cooling appliances include but are not limited to chillers, commercial split systems, dual-function heat pumps, and packaged roof-top units.

Commercial refrigeration means the refrigerant-containing appliances used in the retail food and cold storage warehouse subsectors. Retail food appliances include the refrigerant-containing appliances found in supermarkets, convenience stores, restaurants, and other food service establishments. Cold storage includes the refrigerant-containing appliances used to store meat, produce, dairy products, and other perishable goods.

Component, as it relates to a refrigerant-containing appliance, means a part of the refrigerant circuit within an appliance including but not limited to compressors, condensers, evaporators, receivers, and all of its connections and subassemblies.

Custom-built means that the industrial process refrigeration equipment or any of its components cannot be purchased and/or installed without being uniquely designed, fabricated and/or assembled to satisfy a specific set of industrial process conditions.

Disposal, as it relates to refrigerant-containing equipment, means the process leading to and including:

(1) The discharge, deposit, dumping, or placing of any discarded refrigerant-containing equipment into or on any land or water;

(2) The disassembly of any refrigerant-containing equipment for discharge, deposit, dumping, or placing of its discarded component parts into or on any land or water;

(3) The vandalism of any refrigerant-containing equipment such that the refrigerant is released into the environment or would be released into the environment if it had not been recovered prior to the destructive activity;

(4) The disassembly of any refrigerant-containing equipment for reuse of its component parts; or

(5) The recycling of any refrigerant-containing equipment for scrap.

Disposal, as it relates to fire suppression equipment, means the process leading to and including:

(1) The discharge, deposit, dumping, or placing of any fire suppression equipment into or on any land or water;

(2) The disassembly of any fire suppression equipment for discharge, deposit, dumping, or placing of its discarded component parts into or on any land or water; or

(3) The disassembly of any fire suppression equipment for reuse of its component parts.

Equipment means any device that contains, uses, detects, or is otherwise

connected to or associated with a regulated substance or substitute for a regulated substance, including any component, system, refrigerant-containing appliance, and fire suppression equipment.

Fire suppression equipment means any device that is connected to or associated with a regulated substance or substitute for a regulated substance, including blends and mixtures, consisting in part or whole of a regulated substance or a substitute for a regulated substance, and that is used for fire suppression purposes. This term includes any such equipment, component, or system. This term does not include military equipment used in deployable and expeditionary situations. This term also does not include space vehicles as defined in 40 CFR 84.3.

Fire suppression technician means any person who in the course of servicing, repair, disposal, or installation of fire suppression equipment could be reasonably expected to violate the integrity of the fire suppression equipment and therefore release fire suppressants into the environment.

Follow-up verification test, as it relates to a refrigerant-containing appliance, means those tests that involve checking the repairs to an appliance after a successful initial verification test and after the appliance has returned to normal operating characteristics and conditions to verify that the repairs were successful. Potential methods for follow-up verification tests include but are not limited to the use of soap bubbles as appropriate, electronic or ultrasonic leak detectors, pressure or vacuum tests, fluorescent dye and black light, infrared or near infrared tests, and handheld gas detection devices.

Full charge, as it relates to a refrigerant-containing appliance, means the amount of refrigerant required for normal operating characteristics and conditions of the appliance as determined by using one or a combination of the following four methods:

(1) Use of the equipment manufacturer's determination of the full charge;

(2) Use of appropriate calculations based on component sizes, density of refrigerant, volume of piping, and other relevant considerations;

(3) Use of actual measurements of the amount of refrigerant added to or evacuated from the appliance, including for seasonal variances; and/or

(4) Use of an established range based on the best available data regarding the normal operating characteristics and conditions for the appliance, where the midpoint of the range will serve as the full charge.

Industrial process refrigeration means complex customized refrigerant-containing appliances that are directly linked to the processes used in, for example, the chemical, pharmaceutical, petrochemical, and manufacturing industries. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks. Where one appliance is used for both industrial process refrigeration and other applications, it will be considered industrial process refrigeration equipment if 50 percent or more of its operating capacity is used for industrial process refrigeration.

Initial verification test, as it relates to a refrigerant-containing appliance, means those leak tests that are conducted after the repair is finished to verify that a leak or leaks have been repaired before refrigerant is added back to the appliance.

Installation means the process of setting up equipment for use, which may include steps such as completing the refrigerant circuit, including charging equipment with a regulated substance or substitute for a regulated substance, or connecting cylinders containing a regulated substance or a substitute for a regulated substance to a total flooding fire suppression system, such that the equipment can function and is ready for use for its intended purpose.

Leak inspection, as it relates to a refrigerant-containing appliance, means the examination of an appliance to detect and determine the location of refrigerant leaks. Potential methods include but are not limited to ultrasonic tests, gas-imaging cameras, bubble tests as appropriate, or the use of a leak detection device operated and maintained according to manufacturer guidelines. Methods that determine whether the appliance is leaking refrigerant but not the location of a leak, such as standing pressure/vacuum decay tests, sight glass checks, viewing receiver levels, pressure checks, and charging charts, must be used in conjunction with methods that can determine the location of a leak.

Leak rate, as it relates to a refrigerant-containing appliance, means the rate at which an appliance is losing refrigerant, measured between refrigerant charges. The leak rate is expressed in terms of the percentage of the appliance's full charge that would be lost over a 12-month period if the current rate of loss were to continue over that period. The rate must be calculated using one of the following methods. The same method must be used for all appliances subject to the leak repair requirements located at an operating facility.

(1) *Annualizing Method*—(i) *Step 1.* Take the number of pounds of refrigerant added to the appliance to return it to a full charge, whether in one addition or in multiple additions related to same leak, and divide it by the number of pounds of refrigerant the appliance normally contains at full charge;

(ii) *Step 2.* Take the shorter of the number of days that have passed since the last day refrigerant was added or 365 days and divide that number by 365 days;

(iii) *Step 3.* Take the number calculated in Step 1 and divide it by the number calculated in Step 2; and

(iv) *Step 4.* Multiply the number calculated in Step 3 by 100 to calculate a percentage. This method is summarized in the following formula:

Formula 1 to paragraph (1)(iv)

$$\text{Leak rate (\% per year)} = \frac{\text{pounds of refrigerant added}}{\text{pounds of refrigerant in full charge}} \times \frac{\text{365 days/year}}{\text{shorter of \# days since refrigerant last added or 365 days}} \times 100\%$$

(2) *Rolling Average Method*—(i) *Step 1.* Take the sum of the pounds of refrigerant added to the appliance over the previous 365-day period (or over the period that has passed since the last successful follow-up verification test showing all identified leaks in the appliance were repaired, if that period is less than one year);

(ii) *Step 2.* Divide the result of Step 1 by the pounds of refrigerant the

appliance normally contains at full charge; and

(iii) *Step 3.* Multiply the result of Step 2 by 100 to obtain a percentage. This method is summarized in the following formula:

Formula 2 to paragraph (2)(iii)

$$\text{Leak rate (\% per year)} = \frac{\text{pounds of refrigerant added over past 365 days (or since the last successful follow-up verification test showing all identified leaks in the appliance were repaired, if that period is less than one year)}}{\text{pounds of refrigerant in full charge}} \times 100\%$$

Mothball, as it relates to a refrigerant-containing appliance, means to evacuate refrigerant from an appliance, or the affected isolated section or component of an appliance, to at least atmospheric pressure, and to temporarily shut down that appliance.

Motor vehicle means any vehicle which is self-propelled and designed for transporting persons or property on a street or highway, including but not limited to passenger cars, light-duty vehicles, and heavy-duty vehicles. This definition does not include a vehicle where final assembly of the vehicle has not been completed by the original equipment manufacturer.

Motor vehicle air conditioners (MVAC) means mechanical vapor compression refrigerant-containing appliances used to cool the driver's or passenger's compartment of any motor vehicle. This definition is intended to have the same meaning as in 40 CFR 82.32.

MVAC-like appliance means a mechanical vapor compression, open-drive compressor refrigerant-containing appliance with a full charge of 20 pounds or less of refrigerant used to cool the driver's or passenger's compartment of off-road vehicles. This includes, but is not limited to, the air-conditioning appliances found on agricultural or construction vehicles. This definition is intended to have the same meaning as in 40 CFR 82.152.

Normal operating characteristics and conditions, as it relates to a refrigerant-containing appliance, means appliance operating temperatures, pressures, fluid flows, speeds, and other characteristics, including full charge of the appliance, that would be expected for a given process load and ambient condition during normal operation. Normal operating characteristics and conditions are marked by the absence of atypical conditions affecting the operation of the appliance.

Owner or operator means any person who owns, leases, operates, or controls any equipment, or who controls or supervises any practice, process, or activity that is subject to any requirement pursuant to this subpart.

Recover means the process by which a regulated substance, or where applicable, a substitute for a regulated substance, is (1) removed, in any condition, from equipment and (2) stored in an external container, with or without testing or processing the regulated substance or substitute for a regulated substance.

Recycling, when referring to fire suppression or fire suppressants, means the testing and/or reprocessing of regulated substances used in the fire suppression sector to certain purity standards.

Refrigerant means any substance, including blends and mixtures, consisting in part or whole of a regulated substance or a substitute for a regulated substance that is used for heat transfer purposes and provides a cooling effect.

Refrigerant circuit, as it relates to a refrigerant-containing appliance, means the parts of an appliance that are normally connected to each other (or are separated only by internal valves) and are designed to contain refrigerant.

Refrigerant-containing appliance means any device that contains and uses a regulated substance or substitute for a regulated substance as a refrigerant including but not limited to any air conditioner, MVAC, MVAC-like appliance, refrigerator, chiller, or freezer. For such devices with multiple circuits, each independent circuit is considered a separate appliance.

Refrigerant-containing equipment means equipment as defined in this subpart that contains, uses, or is otherwise connected to or associated with a regulated substance or substitute for a regulated substance that is used as a refrigerant. This definition includes refrigerant-containing components and refrigerant-containing appliances. This term does not include military equipment used in deployable and expeditionary situations. This term also does not include space vehicles as defined in 40 CFR 84.3.

Repackager means an entity that transfers regulated substances, either alone or in a blend, from one container to another container prior to sale or distribution or offer for sale or distribution. An entity that services system cylinders for use in fire suppression equipment and returns the same regulated substances to the same system cylinder it was recovered from after the system cylinder is serviced is not a repackager.

Repair, as it relates to a particular leak in a refrigerant-containing appliance, means making adjustments or other alterations to that refrigerant-containing appliance that have the effect of stopping leakage of refrigerant from that particular leak.

Reprocess means using procedures such as filtering, drying, distillation, and other chemical procedures to remove impurities from a regulated substance or a substitute for a regulated substance.

Retire, as it relates to a refrigerant-containing appliance, means the removal of the refrigerant and the disassembly or impairment of the refrigerant circuit such that the appliance as a whole is rendered unusable by any person in the future.

Retrofit, as it relates to a refrigerant-containing appliance, means to convert an appliance from one refrigerant to another refrigerant. Retrofitting includes the conversion of the appliance to achieve system compatibility with the new refrigerant and may include, but is not limited to, changes in lubricants, gaskets, filters, driers, valves, o-rings, or appliance components.

Seasonal variance, as it relates to a refrigerant-containing appliance, means the removal of refrigerant from an appliance due to a change in ambient conditions caused by a change in season, followed by the subsequent addition of an amount that is less than or equal to the amount of refrigerant removed in the prior change in season, where both the removal and addition of refrigerant occurs within one consecutive 12-month period.

Stationary refrigerant-containing equipment means refrigerant-containing equipment, as defined in this subpart, that is not an MVAC or an MVAC-like appliance, as defined in this subpart.

Substitute for a regulated substance means a substance that can be used in equipment in the same or similar applications as a regulated substance, to serve the same or a similar purpose, including but not limited to a substance used as a refrigerant in a refrigerant-containing appliance or as a fire suppressant in fire suppression equipment, provided that the substance is not a regulated substance or an ozone-depleting substance.

Technician, as it relates to any person who works with refrigerant-containing appliances, means any person who in the course of servicing, repair, or installation of a refrigerant-containing appliance (except MVACs) could be reasonably expected to violate the integrity of the refrigerant circuit and therefore release refrigerants into the environment. Technician also means any person who in the course of disposal of a refrigerant-containing appliance (except small appliances as defined in 40 CFR 82.152, MVACs, and MVAC-like appliances) could be reasonably expected to violate the integrity of the refrigerant circuit and therefore release refrigerants from the appliances into the environment. Activities reasonably expected to violate the integrity of the refrigerant circuit include but are not limited to: Attaching or detaching hoses and gauges to and from the appliance; adding or removing refrigerant; adding or removing components; and cutting the refrigerant line. Activities such as painting the appliance, rewiring an external electrical circuit, replacing insulation on a length of pipe, or tightening nuts and bolts are not reasonably expected to violate the integrity of the refrigerant circuit. Activities conducted on refrigerant-containing appliances that have been properly evacuated pursuant to 40 CFR 82.156 are not reasonably expected to release refrigerants unless the activity includes adding refrigerant to the appliance. Technicians could include but are not limited to installers, contractor employees, in-house service personnel, and owners and/or operators of refrigerant-containing appliances.

Virgin regulated substance means any regulated substance that has not had any bona fide use in equipment.

§ 84.104 Prohibitions.

(a) *Sale of recovered refrigerant.* No person may sell, distribute, or transfer to a new owner, or offer for sale, distribution, or transfer to a new owner, any regulated substance used as a refrigerant in stationary refrigerant-containing equipment consisting in whole or in part of recovered regulated substances, unless the recovered regulated substance:

(1) Has been reclaimed by a person who has been certified as a reclaimer under 40 CFR 82.164 and has been reclaimed by being reprocessed to all of the specifications in appendix A to 40 CFR part 82, subpart F that are applicable to that regulated substance and verified to meet these specifications using the analytical methodology prescribed in section 5 of appendix A to 40 CFR part 82, subpart F; or

(2) Is sold, distributed, or transferred to a new owner, or offered for sale, distribution, or transfer to a new owner solely for the purposes of being reclaimed or destroyed.

(b) [Reserved]

§ 84.106 Leak repair.

(a) *Applicability.* This section applies to refrigerant-containing appliances with a full charge of 15 or more pounds of refrigerant where the refrigerant contains:

(1) A regulated substance,

(2) A substitute for a regulated substance that has a global warming potential greater than 53, based on the global warming potentials listed in table 1 of § 84.64(b).

(3) Notwithstanding the criteria in paragraphs (a)(1) and (2) of this section, the requirements of this section do not apply to:

(i) Appliances (as defined in 40 CFR 82.152) containing solely an ozone-depleting substance as listed in 40 CFR part 82, subpart A as a refrigerant;

(ii) Refrigerant-containing appliances used for the residential and light commercial air conditioning and heat pump subsector.

(4) The requirements of this section apply as of January 1, 2026.

(b) *Leak rate calculation.* Persons adding or removing refrigerant from a refrigerant-containing appliance must, upon conclusion of that installation, service, repair, or disposal, provide the owner or operator with documentation that meets the applicable requirements of paragraph (l)(2) of this section. The owner or operator must calculate the leak rate every time refrigerant is added to an appliance unless the addition is made immediately following a retrofit, installation of a new refrigerant-containing appliance, or qualifies as a seasonal variance.

(1) Where an owner or operator is using the annualizing method to calculate a leak rate for a refrigerant-containing appliance for the first time after January 1, 2026, the calculation should substitute 365 days as the number of days since last refrigerant addition.

(2) Where an owner or operator is using the rolling average method to calculate a leak rate for a refrigerant-containing appliance for the first time after January 1, 2026, the calculation should substitute pounds of refrigerant added since January 1, 2026.

(3) An owner or operator may switch to a different leak rate calculation methodology only if the following requirements are met:

(i) The owner or operator has purchased or otherwise acquired an operating facility with one or more refrigerant-containing appliance(s) which was previously using a different leak rate calculation methodology than the methodology being used at other facilities owned or operated by the owner or operator;

(ii) The owner or operator has determined the refrigerant-containing appliance(s) at any operating facility for which the leak rate calculation methodology would change are not exceeding the applicable leak rate in paragraph (c)(2) of this section under either of the leak rate calculation methodologies ; and

(iii) The owner or operator must retain a record of this change as described in paragraph (l)(3) of this section.

(c) *Requirement to address leaks through repair, or retrofitting or retiring a refrigerant-containing appliance.* (1) Owners or operators must repair leaks in refrigerant-containing appliances with a leak rate over the applicable leak rate in this paragraph in accordance with paragraphs (d) through (f) of this section unless the owner or operator elects to retrofit or retire the refrigerant-containing appliance in compliance with paragraphs (h) and (i) of this section. If the owner or operator elects to repair leaks but fails to bring the leak rate below the applicable leak rate, the owner or operator must create and implement a retrofit or retirement plan in accordance with paragraphs (h) and (i) of this section. Repairs must be conducted by a certified technician, as defined in this subpart.

(2) Leak rates:

(i) 20 percent leak rate for commercial refrigeration appliances;

(ii) 30 percent leak rate for industrial process refrigeration appliances; and

(iii) 10 percent leak rate for comfort cooling appliances, refrigerated transport appliances, or other refrigerant-containing appliances with a full charge of 15 or more pounds of

refrigerant not covered by paragraph (c)(2)(i) or (ii) of this section.

(d) *Appliance repair.* Owners or operators must identify and repair leaks in accordance with this paragraph within 30 days (or 120 days if an industrial process shutdown is required) of when refrigerant is added to a refrigerant-containing appliance exceeding the applicable leak rate in paragraph (c) of this section.

(1) A certified technician must conduct a leak inspection, as described in paragraph (g) of this section, to identify the location of leaks.

(2) Leaks must be repaired such that the leak rate of the refrigerant-containing appliance is brought below the applicable leak rate. This must be confirmed by the leak rate calculation performed upon the next refrigerant addition. Leak repairs will be presumed to be successful if, over the 12-month period after the date of a successful follow-up verification test, there is no further refrigerant addition or if the leak inspections required under paragraph (g) and/or automatic leak detection systems required by § 84.108 do not find any leaks in the appliance. Repairs of leaks must be documented by both an initial and a follow-up verification test or tests.

(3) The time frames in paragraphs (d) through (f) of this section are temporarily suspended when an appliance is mothballed. The time will resume on the day additional refrigerant is added to the refrigerant-containing appliance (or component of a refrigerant-containing appliance if the leaking component was isolated).

(e) *Verification tests.* The owner or operator must conduct both initial and follow-up verification tests on each leak that was repaired under paragraph (d) of this section.

(1) *Initial verification test.* Unless granted additional time, an initial verification test must be performed within 30 days (or 120 days if an industrial process shutdown is required) of a refrigerant-containing appliance exceeding the applicable leak rate in paragraph (c) of this section. An initial verification test must demonstrate that for leaks where repair attempts were made, the adjustments or alterations to the refrigerant-containing appliance have held.

(i) For repairs that can be completed without the need to open or evacuate the refrigerant-containing appliance, the test must be performed after the conclusion of the repairs and before any additional refrigerant is added to the refrigerant-containing appliance.

(ii) For repairs that require the evacuation of the refrigerant-containing appliance or portion of the refrigerant-containing appliance, the test must be performed before adding any refrigerant to the refrigerant-containing appliance.

(iii) If the initial verification test indicates that the repairs have not been successful, the owner or operator may conduct as many additional repairs and initial verification tests as needed within the applicable time period.

(2) *Follow-up verification test.* A follow-up verification test must be performed within 10 days of the successful initial verification test or 10 days of the refrigerant-containing appliance reaching normal operating characteristics and conditions (if the refrigerant-containing appliance or isolated component was evacuated for the repair(s)). Where it is unsafe to be present or otherwise impossible to conduct a follow-up verification test when the system is operating at normal operating characteristics and conditions, the verification test must, where practicable, be conducted prior to the system returning to normal operating characteristics and conditions.

(i) A follow-up verification test must demonstrate that leaks where repair attempts were made are repaired. If the follow-up verification test indicates that the repairs have not been successful, the owner or operator may conduct as many additional repairs and verification tests as needed to bring the refrigerant-containing appliance below the leak rate within the applicable time period and to verify the repairs.

(ii) [Reserved]

(f) *Extensions to the appliance repair deadlines.* Owners or operators are permitted more than 30 days (or 120 days if an industrial process shutdown is required) to comply with paragraphs (d) and (e) of this section if they meet the requirements of paragraphs (f)(1) through (4) of this section or the refrigerant-containing appliance is mothballed. Extension requests must be signed by an authorized company official. The request will be considered approved unless EPA notifies the owners or operators otherwise.

(1) One or more of the following conditions must apply:

(i) The refrigerant-containing appliance is located in an area subject to radiological contamination or shutting down the refrigerant-containing appliance will directly lead to radiological contamination. Additional time is permitted to the extent needed to conduct and finish repairs in a safe working environment.

(ii) Requirements of other applicable Federal, State, local, or Tribal regulations make repairs within 30 days (or 120 days if an industrial process shutdown is required) impossible. Additional time is permitted to the extent needed to comply with the pertinent regulations.

(iii) Components that must be replaced are not available within 30 days (or 120 days if an industrial process shutdown is required). Additional time is permitted up to 30 days after receiving delivery of the necessary components, not to exceed 180 days (or 270 days if an industrial process shutdown is required) from the date the refrigerant-containing appliance exceeded the applicable leak rate.

(2) Repairs to leaks that the technician has identified as significantly contributing to the exceedance of the leak rate and that do not require additional time must be completed and verified within the initial 30-day repair period (or 120-day repair period if an industrial process shutdown is required);

(3) The owner or operator must document all repair efforts and the reason for the inability to make all necessary repairs within the initial 30-day repair period (or 120-day repair period if an industrial process shutdown is required); and

(4) The owner or operator must request an extension from EPA electronically, using the Agency's applicable reporting platform, within 30 days (or 120 days if an industrial process shutdown is required) of the refrigerant-containing appliance exceeding the applicable leak rate in paragraph (c) of this section. Extension requests must include: Identification and address of the facility; the name of the owner or operator of the refrigerant-containing appliance; the leak rate; the method used to determine the leak rate and full charge; the date the refrigerant-containing appliance exceeded the applicable leak rate; the location of leak(s) to the extent determined to date; any repairs that have been performed thus far, including the date that repairs were completed; the reasons why more than 30 days (or 120 days if an industrial process shutdown is required) are needed to complete the repairs; an estimate of when the repairs will be completed; and a signature from an authorized company official. If the estimated completion date is to be extended, a new estimated date of completion and documentation of the reason for that change must be submitted to EPA within 30 days of identifying that the completion date must be extended. The owner or operator must keep a dated copy of these submissions.

(g) *Leak inspections.* (1) The owner or operator must conduct a leak inspection in accordance with the following schedule on any refrigerant-containing appliance exceeding the applicable leak rate in paragraph (c)(2) of this section.

(i) For commercial refrigeration and industrial process refrigeration appliances with a full charge of 500 or more pounds, leak inspections must be conducted once every three months after the date of a successful follow-up verification test, until the owner or operator can demonstrate through the leak rate calculations required under paragraph (b) of this section that the appliance has not leaked in excess of the applicable leak rate for four quarters in a row.

(ii) For commercial refrigeration and industrial process refrigeration appliances with a full charge of 15 or more pounds but less than 500 pounds, leak inspections must be conducted once per year after the date of a successful follow-up verification test, until the owner or operator can demonstrate through the leak rate calculations required under paragraph (b) of this section that the appliance has not leaked in excess of the applicable leak rate for one year.

(iii) For comfort cooling appliances and other appliances not covered by paragraphs (g)(1)(i) and (ii) of this section, leak inspections must be conducted once per year after the date of a successful follow-up verification test, until the owner or operator can demonstrate through the leak rate calculations required under paragraph (b) of this section that the appliance has not leaked in excess of the applicable leak rate for one year.

(2) Leak inspections must be conducted by a certified technician using method(s) determined by the certified technician to be appropriate for that refrigerant-containing appliance.

(3) All visible and accessible components of a refrigerant-containing appliance must be inspected, with the following exceptions:

(i) Where components are insulated, under ice that forms on the outside of equipment, underground, behind walls, or are otherwise inaccessible;

(ii) Where personnel must be elevated more than two meters above a support surface; or

(iii) Where components are unsafe to inspect, as determined by site personnel.

(4) Quarterly or annual leak inspections are not required on refrigerant-containing appliances, or portions of refrigerant-containing appliances, continuously monitored by an automatic leak detection system that is audited or calibrated annually. An automatic leak detection system may directly detect refrigerant in air, monitor its surrounding in a manner other than detecting refrigerant concentrations in air, or monitor conditions of the appliance. An automatic leak detection system being used for this purpose must meet the requirements for automatic leak detection systems in § 84.108(c) through (g) and § 84.108(i).

(i) When an automatic leak detection system is only being used to monitor portions of a refrigerant-containing appliance, the remainder of the refrigerant-containing appliance continues to be subject to any applicable leak inspection requirements.

(ii) [Reserved]

(h) *Retrofit or retirement plans.* (1) The owner or operator must create a retrofit or retirement plan within 30 days of:

(i) A refrigerant-containing appliance leaking above the applicable leak rate in paragraph (c) of this section if the owner or operator intends to retrofit or retire rather than repair leaks;

(ii) A refrigerant-containing appliance leaking above the applicable leak rate in paragraph (c) of this section if the owner or operator fails to take any action to identify or repair leaks; or

(iii) A refrigerant-containing appliance continues to leak above the applicable leak rate after having conducted the required repairs and verification tests under paragraphs (d) and (e) of this section.

(2) A retrofit or retirement plan must, at a minimum, contain the following information:

(i) Identification and location of the refrigerant-containing appliance;

(ii) Type and full charge of the refrigerant used in the refrigerant-containing appliance;

(iii) Type and full charge of the refrigerant to which the refrigerant-containing appliance will be converted, if retrofitted;

(iv) Itemized procedure for converting the refrigerant-containing appliance to a different refrigerant, including changes required for compatibility with the new refrigerant, if retrofitted;

(v) Plan for the disposition of recovered refrigerant;

(vi) Plan for the disposition of the refrigerant-containing appliance, if retired; and

(vii) A schedule, not to exceed one year, for completion of the appliance retrofit or retirement.

(3) The retrofit or retirement plan must be signed by an authorized company official, dated, accessible at the site of the refrigerant-containing appliance in paper copy or electronic format, and available for EPA inspection upon request.

(4) All identified leaks must be repaired as part of any retrofit under such a plan.

(5) A retrofit or retirement plan must be implemented as follows:

(i) Unless granted additional time, all work performed in accordance with the plan must be finished within one year of the plan's date (not to exceed 12 months from when the plan was finalized as required in paragraph (h)(1) of this section).

(ii) The owner or operator may request that EPA relieve it of the obligation to retrofit or retire a refrigerant-containing appliance if the owner or operator can establish within 180 days of the plan's date that the refrigerant-containing appliance no longer exceeds the applicable leak rate and if the owner or operator agrees in writing to repair all identified leaks within one year of the plan's date consistent with paragraphs (h)(4) and (h)(5)(i) of this section. The owner or operator must submit to EPA the retrofit or retirement plan as well as the following information: The date that the requirement to develop a retrofit or retirement plan was triggered; the leak rate; the method used to determine the leak rate and full charge; the location of the leak(s) identified in the leak inspection; a description of the repairs that have been completed; a description of repairs that have not been completed; a description of why repairs were not conducted within the time frames required under paragraphs (d) and (f) of this section; and a statement signed by an authorized company official that all identified leaks will be repaired and an estimate of when those repairs will be completed (not to exceed one year from date of the plan). The request will be considered approved unless EPA notifies the owner or operator within 60 days of receipt of the request that it is not approved.

(i) *Extensions to the one-year retrofit or retirement schedule.* Owners or operators may request more than one year to comply with paragraph (h) of this section if they meet the requirements of this paragraph. The request will be considered approved unless EPA notifies the owners or operators within 60 days of receipt of the request that it is not approved. The request must be submitted to EPA electronically, using the Agency's applicable reporting platform, within seven months of discovering the refrigerant-containing appliance exceeded the applicable leak rate. The request must include the identification of the refrigerant-containing appliance;

name of the owner or operator; the leak rate; the method used to determine the leak rate and full charge; the date the refrigerant-containing appliance exceeded the applicable leak rate; the location of leaks(s) to the extent determined to date; any repairs that have been finished thus far, including the date that repairs were finished; a plan to finish the retrofit or retirement of the refrigerant-containing appliance; the reasons why more than one year is necessary to retrofit or retire the refrigerant-containing appliance; the date of notification to EPA; a signature from an authorized company official; and an estimate of when the retrofit or retirement will be finished. A dated copy of the request must be available on-site in either electronic or paper copy. If the estimated completion date is to be revised, a new estimated date of completion and documentation of the reason for that change must be submitted to EPA electronically, using the Agency's applicable reporting platform, within 30 days. Additionally, the time frames in paragraph (h) of this section and this paragraph (i) are temporarily suspended when a refrigerant-containing appliance is mothballed. The time will resume running on the day additional refrigerant is added to the refrigerant-containing appliance (or component of a refrigerant-containing appliance if the leaking component was isolated).

(1) *Extensions available to industrial process refrigeration.* Owners or operators of industrial process refrigeration appliances may request additional time beyond the one-year period in paragraph (h) of this section to finish the retrofit or retirement under the following circumstances:

(i) Requirements of other applicable Federal, State, local, or Tribal regulations make a retrofit or retirement within one year impossible. Additional time is permitted to the extent needed to comply with the pertinent regulations;

(ii) The new or the retrofitted equipment is custom-built as defined in this subpart and the supplier of the appliance or one of its components has quoted a delivery time of more than 30 weeks from when the order is placed. The appliance or appliance components must be installed within 120 days after receiving delivery of the necessary parts;

(iii) The equipment or component is located in an area subject to radiological contamination and creating a safe working environment will require more than 30 weeks; or

(iv) After receiving an extension under paragraph (i)(1)(ii) of this section, owners or operators may request additional time if necessary to finish the retrofit or retirement of the refrigerant-containing appliance. The request must be submitted to EPA before the end of the ninth month of the initial extension and must include the same information submitted for that extension, with any necessary revisions. A dated copy of the request must be available on-site in either electronic or paper copy. The request will be considered approved unless EPA notifies the owners or operators within 60 days of receipt of the request that it is not approved.

(2) [Reserved]

(j) *Chronically leaking appliances.* Owners or operators of refrigerant-containing appliances containing 15 or more pounds of refrigerant that leak 125 percent or more of the full charge in a calendar year must submit a report containing the information required in paragraph (m)(4) of this section to EPA by March 1 of the subsequent year.

(k) *Purged refrigerant.* In calculating annual leak rates, purged refrigerant that is destroyed at a verifiable destruction efficiency of 98 percent or greater will not be counted toward the leak rate.

(l) *Recordkeeping.* All records identified in this paragraph must be kept for at least three years in electronic or paper format, unless otherwise specified.

(1) By January 1, 2026, or upon installation for refrigerant-containing appliances installed on or after January 1, 2026, owners or operators must determine the full charge of all refrigerant-containing appliances with 15 or more pounds of refrigerant and maintain the following information for each appliance until three years after the appliance is retired:

(i) The identification of the owner or operator of the refrigerant-containing appliance;

(ii) The address where the appliance is located;

(iii) The full charge of the refrigerant-containing appliance and the method for how the full charge was determined;

(iv) If using method 4 (using an established range) for determining full charge, records must include the range for the full charge of the refrigerant-containing appliance, its midpoint, and how the range was determined;

(v) Any revisions of the full charge, how they were determined, and the dates such revisions occurred; and

(vi) The date of installation.

(2) Owners or operators must maintain a record including the following information for each time a refrigerant-containing appliance with a full charge of 15 or more pounds is installed, serviced, repaired, or disposed of, when applicable.

(i) The identity and location of the refrigerant-containing appliance;

(ii) The date of the installation, service, repair, or disposal performed;

(iii) The part(s) of the refrigerant-containing appliance being installed, serviced, repaired, or disposed;

(iv) The type of installation, service, repair, or disposal performed for each part;

(v) The name of the person performing the installation, service, repair, or disposal;

(vi) The amount and type of refrigerant added to, or in the case of disposal removed from, the appliance;

(vii) The full charge of the refrigerant-containing appliance; and

(viii) The leak rate and the method used to determine the leak rate (not applicable when disposing of the refrigerant-containing appliance, following a retrofit, installing a new refrigerant-containing appliance, or if the refrigerant addition qualifies as a seasonal variance).

(3) Owners or operators must maintain the following records of changes to the leak rate calculation method after a change in ownership or acquisition specified in paragraph (b)(3) of this section:

(i) Basic identification information (*i.e.,* owner or operator, facility name, facility address where appliance is located, and appliance ID or description);

(ii) The date the operating facility referenced in paragraph (b)(3)(i) was purchased or otherwise acquired;

(iii) The leak rates for all refrigerant-containing appliances at any operating facility for which the leak rate calculation methodology would change, listing the results for each leak rate calculation methods (the annualizing method and the rolling average method) separately;

(iv) The date the new leak rate calculation method is adopted; and

(v) The leak rate calculation method the owner or operator is using after the change.

(4) If the installation, service, repair, or disposal is done by someone other than the owner or operator, that person must provide a record containing the information specified in paragraph (l)(2)(i) through (l)(2)(vi) of this section, when applicable, to the owner or operator.

(5) Owners or operators must keep records of leak inspections that include the date of inspection, the method(s) used to conduct the leak inspection, a list of the location of each leak that was identified, and a certification that all

visible and accessible parts of the refrigerant-containing appliance were inspected. The certified technicians conducting the leak inspections must, upon conclusion of that service, provide the owner or operator of the refrigerant-containing appliance with documentation that meets these requirements.

(6) If using an automatic leak detection system, the owner or operator must maintain records regarding the installation and the annual audit and calibration of the system, a record of each date the monitoring system identified a leak, and the location of the leak.

(7) Owners or operators must maintain records of the dates and results of all initial and follow-up verification tests. Records must include the location of the refrigerant-containing appliance, the date(s) of the verification tests, the location(s) of all repaired leaks that were tested, the type(s) of verification test(s) used, and the results of those tests. The certified technicians conducting the initial or follow-up verification tests must, upon conclusion of that service, provide the owner or operator of the appliance with documentation that meets these requirements.

(8) Owners or operators must maintain retrofit or retirement plans developed in accordance with paragraph (h) of this section.

(9) Owners or operators must maintain retrofit and/or retirement extension requests submitted to EPA in accordance with paragraph (i) of this section.

(10) Owners or operators that suspend the deadlines in this section by mothballing a refrigerant-containing appliance must keep records documenting when the appliance was mothballed and when additional refrigerant was added to the appliance (or isolated component).

(11) Owners or operators who exclude purged refrigerants that are destroyed from annual leak rate calculations must maintain records to support the amount of refrigerant claimed as sent for destruction. Records must be based on a monitoring strategy that provides reliable data to demonstrate that the amount of refrigerant claimed to have been destroyed is not greater than the amount of refrigerant actually purged and destroyed and that the 98 percent or greater destruction efficiency is met. Records must include flow rate, quantity or concentration of the refrigerant in the vent stream, and periods of purge flow. Records must include:

(i) The identification of the facility and a contact person, including the address and telephone number;

(ii) A description of the refrigerant-containing appliance, focusing on aspects relevant to the purging of refrigerant and subsequent destruction;

(iii) A description of the methods used to determine the quantity of refrigerant sent for destruction and type of records that are being kept by the owners or operators where the appliance is located;

(iv) The frequency of monitoring and data-recording; and

(v) A description of the control device, and its destruction efficiency.

(12) Owners or operators that exclude additions of refrigerant due to seasonal variance from their leak rate calculation must maintain records stating that they are using the seasonal variance flexibility and documenting the amount added and removed under paragraph (l)(2) of this section.

(13) Owners or operators that submit reports to EPA in accordance with paragraph (m) of this section must maintain copies of the submitted reports and any responses from EPA.

(m) *Reporting.* All notifications must be submitted electronically using the Agency's applicable reporting platform.

(1) Owners or operators must notify EPA electronically, using the Agency's applicable reporting platform, in accordance with paragraph (f) of this section when seeking an extension of time to complete repairs.

(2) Owners or operators must notify EPA electronically, using the Agency's applicable reporting platform, in accordance with paragraph (h)(5)(ii) of this section when seeking relief from the obligation to retrofit or retire an appliance.

(3) Owners or operators must notify EPA electronically, using the Agency's applicable reporting platform, in accordance with paragraph (i) of this section when seeking an extension of time to complete the retrofit or retirement of an appliance.

(4) Owners or operators must report to EPA electronically, using the Agency's applicable reporting platform, the following information in accordance with paragraph (j) of this section for any refrigerant-containing appliance containing 15 or more pounds of refrigerant that leaks 125 percent or more of the full charge in a calendar year:

(i) Basic identification information (*i.e.,* owner or operator, facility name, facility address where appliance is located, and appliance ID or description);

(ii) Refrigerant-containing appliance type (comfort cooling or other, industrial process refrigeration, or commercial refrigeration);

(iii) Refrigerant type;

(iv) Full charge of appliance (pounds);

(v) Annual percent refrigerant loss;

(vi) Dates of refrigerant addition;

(vii) Amounts of refrigerant added;

(viii) Date of last successful follow-up verification test;

(ix) Explanation of cause refrigerant losses;

(x) Description of repair actions taken;

(xi) Whether a retrofit or retirement plan has been developed for the refrigerant-containing appliance and if so, the anticipated date of retrofit or retirement; and

(xii) A signed statement from an authorized company official.

(5) When excluding purged refrigerants that are destroyed from annual leak rate calculations, owners or operators must notify EPA electronically, using the Agency's applicable reporting platform, within 60 days after the first time the exclusion is used by the facility where the appliance is located. The report must include the information included in paragraph (l)(11) of this section and must be signed by an authorized company official.

§ 84.108 Automatic leak detection systems.

(a) Owners or operators of refrigerant-containing appliances used for industrial process refrigeration or commercial refrigeration with a full charge of 1,500 pounds or greater of a refrigerant containing a regulated substance or a substitute for a regulated substance with a global warming potential greater than 53 must install and use an automatic leak detection system in accordance with this section.

(1) If the refrigerant in a refrigerant-containing appliance contains a substitute for a regulated substance, whether the global warming potential of the substitute is greater than 53 will be determined as described in § 84.106(a)(2).

(2) [Reserved]

(b)(1) Owners and operators of refrigerant-containing appliances that are subject to the requirements under paragraph (a) of this section and that are installed on or after January 1, 2026, must install and use an automatic leak detection system upon installation of the refrigerant-containing appliance or within 30 days of installation of the refrigerant-containing appliance.

(2) Owners and operators of refrigerant-containing appliances that are subject to the requirements under paragraph (a) of this section and that

were installed on or after January 1, 2017, and before January 1, 2026, must install and use an automatic leak detection system by January 1, 2027.

(c) Automatic leak detection systems must be installed in accordance with manufacturer instructions.

(d) Automatic leak detection systems must be audited and calibrated annually.

(e) Automatic leak detection systems are required to monitor components located inside an enclosed building or structure.

(f) For automatic leak detection systems that directly detect the presence of a refrigerant in air, the system must:

(1) Have sensors or intakes placed so that they will continuously monitor the refrigerant concentrations in air in proximity to the compressor, evaporator, condenser, and other areas with a high potential for a refrigerant leak;

(2) Accurately detect a concentration level of 10 parts per million of vapor of the specific refrigerant or refrigerants used in the refrigerant-containing appliance(s); and

(3) Alert the owner or operator when a refrigerant concentration of 100 parts per million of vapor of the specific refrigerant or refrigerants used in the appliance(s) is reached.

(g) For automatic leak detection systems that monitor conditions of the refrigerant-containing appliance, the system must automatically alert the owner or operator when measurements indicate a loss of 50 pounds of refrigerant or 10 percent of the full charge, whichever is less.

(h) When an automatic leak detection system alerts an owner or operator of a leak as described in this section, owners and operators of refrigerant-containing appliances using automatic leak detection systems must comply with the requirements either in paragraph (h)(1) or in (h)(2) of this section and must also comply with paragraph (h)(3) of this section where applicable:

(1) Calculate the leak rate within 30 days (or 120 days where an industrial process shutdown would be necessary) of an alert and, if the leak rate is above the applicable leak rate as described in § 84.106(c)(2), comply with the full suite of leak repair provisions in § 84.106; or

(2) Preemptively repair the identified leak(s) before adding refrigerant to the appliance and then calculate the leak rate within 30 days (or 120 days where an industrial process shutdown would be necessary) of an alert. If the leak rate is above the applicable leak rate as described in § 84.106(c)(2), the owner or operator must comply with the full suite of leak repair provisions in § 84.106.

(3) Where a refrigerant-containing appliance using an automatic leak detection system is found to be leaking above the applicable leak rate as described in § 84.106(c)(2), and the automatic leak system is only being used to monitor portions of an appliance, the remainder of the appliance continues to be subject to any applicable leak inspection requirements, as described in § 84.106(g).

(i) *Recordkeeping.* The owner or operator must maintain records for at least three years in electronic or paper format, unless otherwise specified, regarding:

(1) The installation of the automatic leak detection system;

(2) The annual audit and calibration of the system;

(3) A record of each date the automatic leak detection system triggers an alert; and

(4) The location of the leak(s) which resulted in the alarm.

§ 84.110 Emissions from fire suppression equipment.

(a) As of January 1, 2026, no person installing, servicing, repairing, or disposing of fire suppression equipment containing a regulated substance may knowingly vent or otherwise release into the environment any regulated substances used in such equipment.

(1) Release of regulated substances during testing of fire suppression equipment is not subject to the prohibition under this paragraph (a) if the following four conditions are met:

(i) Equipment employing suitable alternative fire suppression agents are not available;

(ii) Release of fire suppression agent is essential to demonstrate equipment functionality;

(iii) Failure of the system or equipment would pose great risk to human safety or the environment; and

(iv) A simulant agent cannot be used in place of the regulated substance for testing purposes.

(2) The prohibition under this paragraph (a) does not apply to qualification and development testing during the design and development process of fire suppression equipment containing regulated substances when such tests are essential to demonstrate equipment functionality and when a suitable simulant agent cannot be used in place of the regulated substance for testing purposes.

(3) The prohibition under this paragraph (a) does not apply to the emergency release of regulated substances for the legitimate purpose of fire extinguishing, explosion inertion, or other emergency applications for which the fire suppression equipment was designed.

(b) As of January 1, 2026, no owner or operator of fire suppression equipment containing regulated substances shall allow the release of regulated substances to occur as a result of failure to maintain such fire suppression equipment.

(c) As of January 1, 2030, recycled regulated substances must be used for the initial installation of new fire suppression equipment, including both total flooding systems and streaming applications, that is installed in the United States. As of January 1, 2026, recycled regulated substances must be used for the servicing and/or repair of existing fire suppression equipment in the United States, including both total flooding systems and streaming applications. Notwithstanding the prior sentences, if the fire suppression equipment does not use any regulated substance, this requirement does not apply. If the fire suppression equipment uses a regulated substance in combination with other fire suppression agents, this requirement will only apply to the regulated substance used.

(d) Any person who employs fire suppression technicians who install, service, repair, or dispose of fire suppression equipment containing regulated substances shall train technicians hired on or before January 1, 2026, on emissions reduction of regulated substances by June 1, 2026. Fire suppression technicians hired after January 1, 2026, shall be trained regarding emissions reduction of regulated substances within 30 days of hiring, or by June 1, 2026, whichever is later.

(1) The fire suppression technician training shall include an explanation of the purpose of the training requirement and also address the following:

(i) The significance of minimizing releases of regulated substances and ensuring technician safety;

(ii) An overview of regulated substances and environmental concerns with regulated substances, including discussion of other federal, State, local, or Tribal fire, building, safety, and environmental codes and standards;

(iii) A review of relevant regulations concerning regulated substances, including the requirements of this subpart that apply with respect to fire suppression equipment; and

(iv) Specific technical instruction relevant to avoiding unnecessary emissions of regulated substances during the servicing, repair, disposal, or installation of fire suppression equipment at the different types of facilities where the technician might

perform such work on fire suppression equipment.

(2) [Reserved]

(e) As of January 1, 2026, no person shall dispose of fire suppression equipment containing regulated substances except by either recovering the regulated substances themselves before sending the equipment for disposal or by leaving the regulated substances in the equipment and sending it for disposal to a facility, such as a fire suppression equipment manufacturer, a distributor, or a fire suppressant recycler.

(f) As of January 1, 2026, no person shall dispose of regulated substances used as a fire suppression agent except by sending it for recycling to a fire suppressant recycler or a reclaimer certified under 40 CFR 82.164, or by arranging for its destruction using one of the controlled processes listed in § 84.29.

(1) Any person using a device to recover, store, and/or transfer regulated substances used in fire suppression equipment must: evacuate the device used to recover, store, and/or transfer regulated substances prior to each use to prevent contamination, arrange for destruction of the recovered regulated substances as necessary; and collect and dispose of wastes from the recycling process.

(2) Any person using recovery and recycling equipment to recover regulated substances from fire suppression equipment must:

(i) Operate and maintain recovery and recycling equipment in accordance with manufacturer specifications to ensure that the equipment performs as specified;

(ii) Repair leaks in storage, recovery, recycling, and/or charging equipment used with regulated substances before use; and

(iii) Ensure that cross-contamination does not occur through the mixing of regulated substances that may be contained in similar cylinders.

(g)(1) As of January 1, 2026, any person who performs first fill of fire suppression equipment, service (*e.g.,* recharge) of fire suppression equipment, and/or recycles regulated substances recovered from fire suppression equipment, such as equipment manufacturers, distributors, agent suppliers, or installers that recycle regulated substances, must submit a report to EPA annually covering the prior year's activity from January 1 through December 31. The first annual report must be submitted to the Agency on February 14, 2027, and subsequent annual reports must be submitted by February 14 of each subsequent year. Each annual report must be submitted electronically, using the Agency's applicable reporting platform. Each annual report must contain basic identification information (*i.e.,* owner name, facility name, facility address where equipment is located) and the following information for each regulated substance: the quantity of material (the combined mass of regulated substance and contaminants) sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment; the quantity of material (the combined mass of regulated substance and contaminants) in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin; the total mass of each regulated substance sold for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment; the total mass of each regulated substance in inventory onsite for the purpose of installation of new fire suppression equipment and servicing and/or repair of existing fire suppression equipment broken out by recovered, recycled, and virgin; and the total mass of waste products the reporting entity sent for disposal, along with information about the disposal facility if waste is not processed by the reporting entity. A copy of the submitted reports must be maintained for three years in either electronic or paper format. If any entity reports information to EPA under § 84.31(j) that is also required to be reported under this paragraph, to the extent the information reported under § 84.31(j) overlaps with the information that must be reported under this paragraph, in lieu of reporting the same information twice, the entity may refer to the corresponding information reported under § 84.31(j) and explain how it satisfies the reporting requirements in completing the reporting under this paragraph.

(2) As of January 1, 2026, any person who employs fire suppression technicians who service, repair, install, or dispose of fire suppression equipment containing regulated substances must maintain an electronic or paper copy of the fire suppression technician training used to meet the requirements in paragraph (d) of this section and make that copy available to EPA upon request. These entities must document that they have provided training to personnel as specified in paragraph (d) of this section and must maintain these records for three years after each training in either electronic or paper format.

(3) As of January 1, 2026, owners and operators of fire suppression equipment containing regulated substances must maintain records documenting that regulated substances are recovered from the fire suppression equipment before it is sent for disposal as specified in paragraph (e) of this section. Such records must be maintained for three years after the relevant equipment is sent for disposal in either electronic or paper format.

§ 84.112 Reclamation.

(a) *Reclamation Standard.* As of January 1, 2026, no person may sell, identify, or report refrigerant as being reclaimed for use in the installation, servicing, or repair of refrigerant-containing equipment if the regulated substance component of the resulting refrigerant contains more than 15 percent, by weight, of virgin regulated substance.

(b) *Bona fide use.* No person may sell, identify, or report refrigerant as being reclaimed if it contains any recovered regulated substance that has not had bona fide use in equipment, unless that refrigerant was removed from the heel or residue of a container that had a bona fide use in the servicing, repair, or installation of refrigerant-containing equipment.

(c) *Labeling.* As of January 1, 2026, reclaimers certified under 40 CFR 82.164 must affix a label to any container they fill that is being sold or distributed or offered for sale or distribution and that contains reclaimed regulated substances to certify that the contents do not exceed 15 percent, by weight, of virgin regulated substances.

(1) The label must read: ''The contents of this container do not exceed the limit of 15 percent, by weight, on virgin regulated substance per *40 CFR 84.112(a).*''

(2) The label must be:

(i) In English;

(ii) Durable and printed or otherwise labeled on, or affixed to, an external surface of the container;

(iii) Readily visible and legible;

(iv) Able to withstand open weather exposure without a substantial reduction in visibility or legibility; and

(v) Displayed on a background of contrasting color.

(d) *Recordkeeping.* As of January 1, 2026, reclaimers certified under 40 CFR 82.164 must generate a record to certify that the reclaimed regulated substance(s) being used to fill a container that will be sold or distributed or offered for sale or distribution do not

exceed 15 percent, by weight, of virgin regulated substances.

(1) The record must be generated electronically, in a format specified by EPA.

(2) The record must contain the following information:

(i) The name, address, contact person, email address, and phone number of the reclaimer certified under 40 CFR 82.164 who is making the certification;

(ii) The date the container was filled with reclaimed regulated substance(s);

(iii) The amount and name of the regulated substance(s) in the container(s);

(iv) Certification that the contents of the container are from a batch where the amount of virgin regulated substance(s) does not exceed 15 percent, by weight, of the total regulated substance(s);

(v) The unique serial number associated with the container(s) filled from the batch;

(vi) Identification of the batch of reclaimed regulated substance(s) used to fill the container(s); and

(vii) The percent, by weight, of virgin regulated substance(s) in the batch used to fill the container(s).

(3) The record must be maintained by the reclaimer certified under 40 CFR 82.164 for three years.

(e) *Servicing and/or repair.* As of January 1, 2029, the servicing and/or repair of refrigerant-containing equipment that contains a regulated substance must be done with reclaimed refrigerant that meets the requirements of 84.112(a)–(c) of this section if such equipment is in one or more of the following subsectors:

(1) Supermarket systems;

(2) Refrigerated transport; and

(3) Automatic commercial ice makers.

(f) *Reporting.* (1) Reclaimers, distributors, and wholesalers of reclaimed refrigerants that contain regulated substances that are sold or distributed for the intended purpose of servicing and/or repair of refrigerant-containing equipment in the subsectors listed in paragraph (e) of this section must submit a report to EPA electronically, using the Agency's applicable reporting platform, by February 14, 2027, covering activity from January 1 through December 31, 2026 and containing the following information: name and address of the company; contact person, email address, and phone number of the responsible party; the quantity of reclaimed refrigerant containing regulated substance(s) by the name and mass of reclaimed refrigerant(s); and indication of the specific subsector(s) where the reclaimed refrigerant(s) containing regulated substance(s) are sold or distributed.

(2) Reclaimers, distributors, and wholesalers of reclaimed refrigerants that contain regulated substances that are sold or distributed for the intended purpose of servicing and/or repair of refrigerant-containing equipment in the subsectors listed in paragraph (e) of this section must submit a report to EPA electronically, using the Agency's applicable reporting platform, by February 14, 2028, covering activity from January 1 through December 31, 2027 and containing the following information: name and address of the company; contact person, email address, and phone number of the responsible party; the quantity of reclaimed refrigerant containing regulated substance(s) by the name and mass of reclaimed refrigerant(s); and indication of the specific subsector(s) where the reclaimed refrigerant(s) containing regulated substance(s) are sold or distributed.

§ 84.114 Exemptions.

(a) Notwithstanding the other provisions of this subpart, the regulations under this subpart do not apply to a regulated substance or a substitute for a regulated substance that is contained in a foam.

(b) Notwithstanding the other provisions of this subpart, the regulations under this subpart do not apply to two applications, mission-critical military end uses and on board aerospace fire suppression, as listed at § 84.13(a), for a year or years for which that application receives an application-specific allowance as defined at § 84.3.

§ 84.116 Requirements for disposable cylinders.

(a) As of January 1, 2028, any person who uses a disposable cylinder must send such disposable cylinder for further processing to remove the heel, as described in paragraphs (b) and (c) of this section, when:

(1) The disposable cylinder contains a regulated substance(s);

(2) The disposable cylinder was used in the servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment; and

(3) The person does not intend to use the disposable cylinder in future servicing, repair, or installation of refrigerant-containing equipment or fire suppression equipment.

(b) Except as provided in paragraphs (e) and (g) in this section, disposable cylinders that meet the criteria in paragraphs (a)(1), (a)(2), and (a)(3) of this section must be sent to:

(1) A reclaimer certified under 40 CFR 82.164;

(2) A fire suppressant recycler, if the disposable cylinder was used in the servicing, repair, or installation of fire suppression equipment;

(3) A final processor, such as a landfill operator or a scrap metal recycler, who is capable of removing the heel from disposable cylinders; or

(4) A refrigerant supplier (including but not limited to distributors and wholesalers), who is capable of removing the heel from disposable cylinders.

(c) Regulated substance(s) removed from heels of disposable cylinders by those entities identified in paragraphs (b)(3) and (b)(4) of this section, where those removed heels are or are not aggregated into a larger container, must be sent to a reclaimer certified under 40 CFR 82.164 or a fire suppressant recycler.

(1) Regulated substance(s) removed from heels of disposable cylinders that exhibit ignitability characteristics (per 40 CFR 261.21), where those removed heels are or are not aggregated into a larger container, must be sent to a reclaimer certified under 40 CFR 82.164 that is in compliance with the requirements at 40 CFR part 266, subpart Q.

(2) [Reserved]

(d) As of January 1, 2028, an entity as described in paragraphs (b)(1), (b)(2), (b)(3), or (b)(4) of this section who receives a disposable cylinder meeting the criteria in paragraphs (a)(1), (a)(2), and (a)(3) of this section must remove all remaining contents from the disposable cylinder prior to discarding the disposable cylinder.

(e) Disposable cylinders that that meet the criteria in paragraphs (a)(1), (a)(2), and (a)(3) of this section may be discarded to a final processor without meeting the requirements in paragraphs (b) and (d) of this section, when:

(1) The heel was removed by a certified technician;

(2) The heel of the used disposable cylinder has been evacuated to a vacuum of 15 in-Hg prior to discarding the cylinder;

(3) The certified technician provides a certification statement, which certifies that the heel was evacuated to a vacuum of 15 in-Hg; states the name and address of the certified technician who evacuated the cylinder(s) and the date the cylinder(s) was/were evacuated; and is signed by the certified technician who evacuated the cylinder(s); and

(4) The certified technician discarding the cylinder to the final processor must provide the signed certification statement described in paragraph (e)(3) of this section to the final processor (which may include a landfill operator

or scrap metal recycler) when they discard the cylinder to the final processor.

(f) *Recordkeeping.* A final processor who receives a disposable cylinder as described in paragraph (e) of this section must maintain a record of the signed statement for three years.

(g) Small cans of refrigerant that contain no more than two pounds of refrigerant and that qualify for the exemption described in 40 CFR 82.154(c)(1)(ix) are not subject to the requirements in paragraphs (b) through (f) of this section.

§ 84.118 Treatment of data submitted under 40 CFR part 84, subpart C

(a) Except as otherwise provided in this section, 40 CFR 2.201 through 2.215 and 2.301 do not apply to data submitted under this subpart that EPA has determined through rulemaking to be either of the following:

(1) Emission data, as defined in 40 CFR 2.301(a)(2), determined in accordance with section 114(c) and 307(d) of the Clean Air Act; or

(2) Data not otherwise entitled to confidential treatment.

(b) Except as otherwise provided in paragraph (d) of this section, 40 CFR 2.201 through 2.208 and 2.301(c) and (d) do not apply to data submitted under this subpart that EPA has determined through rulemaking to be entitled to confidential treatment. EPA shall treat that information as confidential in accordance with the provisions of 40 CFR 2.211, subject to paragraph (d) of this section and 40 CFR 2.209.

(c) Upon receiving a request under 5 U.S.C. 552 for data submitted under this subpart that EPA has determined through rulemaking to be entitled to confidential treatment, the relevant Agency official shall furnish the requestor a notice that the information has been determined to be entitled to confidential treatment and that the request is therefore denied. The notice shall include or cite to the appropriate EPA determination.

(d) A determination made through rulemaking that information submitted under this subpart is entitled to confidential treatment shall continue in effect unless, subsequent to the confidentiality determination through rulemaking, EPA takes one of the following actions:

(1) EPA determines through a subsequent rulemaking that the information is emission data or data not otherwise entitled to confidential treatment; or

(2) The Office of General Counsel issues a final determination, based on the requirements of 5 U.S.C. 552(b)(4), stating that the information is no longer entitled to confidential treatment because of change in the applicable law or newly discovered or changed facts. Prior to making such final determination, EPA shall afford the business an opportunity to submit comments on pertinent issues in the manner described by 40 CFR 2.204(e) and 2.205(b). If, after consideration of any timely comments submitted by the business, the Office of General Counsel makes a revised final determination that the information is not entitled to confidential treatment, the relevant agency official will notify the business in accordance with the procedures described in 40 CFR 2.205(f)(2).

§ 84.120 Relationship to other laws.

Section (k) of the AIM Act states that sections 113, 114, 304, and 307 of the Clean Air Act (42 U.S.C. 7413, 7414, 7604, 7607) shall apply to this section and any rule, rulemaking, or regulation promulgated by the Administrator pursuant to this section as though this section were expressly included in title VI of that Act (42 U.S.C. 7671 *et seq.*). Violation of this part is subject to Federal enforcement and the penalties laid out in section 113 of the Clean Air Act.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

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

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y), and 6938.

Subpart A—General

■ 4. In § 261.6, revise paragraph (a)(2) introductory text, and add paragraph (a)(2)(v) to read as follows:

§ 261.6 Requirements for recyclable materials.

(a) * * *

(2) The following recyclable materials are not subject to the requirements of this section but are regulated under subparts C through Q of part 266 of this chapter and all applicable provisions in parts 268, 270, and 124 of this chapter.

* * * * *

(v) Ignitable spent refrigerants recycled for reuse (40 CFR part 266, subpart Q).

* * * * *

Subpart M—Emergency Preparedness and Response for Management of Excluded Hazardous Secondary Materials

■ 5. In § 261.400, revise the introductory text and add paragraph (c) to read as follows:

§ 261.400 Applicability.

The requirements of this subpart apply to (1) those areas of an entity managing hazardous secondary materials excluded under § 261.4(a)(23) and/or (24) where such materials are generated or accumulated on site, and (2) facilities regulated under the standards at 40 CFR part 266, subpart Q that receive ignitable spent refrigerant from off-site and that are not transfer facilities that store the refrigerants for less than ten (10) days.

* * * * *

(c) Facilities receiving refrigerant from off-site under 40 CFR part 266, subpart Q that are not transfer facilities that store the refrigerants for less than ten (10) days must comply with §§ 261.410 and 261.420.

* * * * *

■ 6. In § 261.420, revise the section heading and introductory text to read as follows:

§ 261.420 Contingency planning and emergency procedures for facilities generating or accumulating more than 6,000 kg of hazardous secondary material or receiving ignitable spent refrigerants

A generator or an intermediate or reclamation facility that generates or accumulates more than 6,000 kg of hazardous secondary material, or a facility receiving refrigerant from off-site under 40 CFR part 266, subpart Q, that is not a transfer facility that stores the refrigerants for less than ten (10) days must comply with the following requirements:

* * * * *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

■ 7. The authority citation for part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922–6925, 6937, 6938 and 6939g.

Subpart A—General

■ 8. In § 262.14, revise paragraph (a)(5)(vi) to read as follows:

§ 262.14 Conditions for exemption for a very small quantity generator.

(a) * * *

(5) * * *

(vi) A facility which:

(A)(*1*) Beneficially uses or reuses, or legitimately recycles or reclaims its waste; or

(*2*) Treats its waste prior to beneficial use or reuse, or legitimate recycling or reclamation; and

(B) For ignitable spent refrigerants regulated under 40 CFR part 266 subpart Q, meets the requirements of that subpart.

* * * * *

PART 266—STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES

■ 9. The authority citation for part 266 continues to read as follows:

Authority: 42 U.S.C. 1006, 2002(a), 3001–3009, 3014, 3017, 6905, 6906, 6912, 6921, 6922, 6924–6927, 6934, and 6937.

■ 10. Add subpart Q, consisting of §§ 266.600 through 266.602, to read as follows:

Subpart Q—Ignitable Spent Refrigerants Recycled for Reuse

Sec.

266.600 Purpose and applicability.
266.601 Definitions for this subpart.
266.602 Standards for ignitable spent refrigerant recycled for reuse under this subpart.

§ 266.600 Purpose and applicability.

(a) The purpose of this subpart is to reduce emissions of ignitable spent refrigerants to the lowest achievable level by maximizing the recovery and safe recycling for reuse of such refrigerants during the service, repair, and disposal of appliances.

(b) The requirements of this subpart operate in lieu of parts 260 through 270 of this chapter and apply to lower flammability spent refrigerants, as defined in § 266.601, where the refrigerant exhibits the hazardous waste characteristic of ignitability per § 261.21 of this chapter and is being recycled for reuse in the United States.

(c) These requirements do not apply to other ignitable spent refrigerants. Ignitable spent refrigerants not subject to this subpart are subject to all applicable requirements of parts 260 through 270 of this chapter when recovered (*i.e.,* removed from an appliance and stored in an external container) and/or disposed of.

§ 266.601 Definitions for this subpart.

For the purposes of this subpart, the following terms have the meanings given below:

(a) *Refrigerant* has the same meaning as defined in 40 CFR 82.152.

(b) *Ignitable spent refrigerant* is a used refrigerant that cannot be reused without first being processed, and that exhibits the hazardous characteristic of ignitability per § 261.21 of this chapter. Used refrigerants that can be legitimately reused without processing are not spent refrigerant.

(c) *Recycle for reuse,* when referring to an ignitable spent refrigerant, means to process the refrigerant to remove contamination and prepare it to be used again. ''Recycle for reuse'' does not include recycling that involves burning for energy recovery or use in a manner constituting disposal as defined in § 261.2(c) of this chapter, or sham recycling as defined in § 261.2(g) of this chapter.

(d) *Lower flammability spent refrigerant* means a spent refrigerant that is not considered highly flammable. Highly flammable refrigerants include but are not limited to the following chemicals: butane, isobutane, methane, propane, and/or propylene.

§ 266.602 Standards for ignitable spent refrigerant recycled for reuse under this subpart.

(a) Persons who recover (*i.e.,* remove from an appliance and store in an external container) and/or recycle ignitable spent refrigerants for reuse either for further use in equipment of the same owner, or in compliance with motor vehicle air conditioner (MVAC) standards in 40 CFR part 82, subpart B, or who send recovered refrigerant off-site to be recycled for reuse must:

(1) Recover and/or recycle for reuse the ignitable spent refrigerant using equipment that is certified for that type of refrigerant and appliance under §§ 82.36 and/or 82.158 of this chapter; and

(2) Not speculatively accumulate the ignitable spent refrigerant per § 261.1(c) of this chapter.

(b) Persons who receive ignitable spent refrigerants from off-site, and are not a transfer facility that stores the refrigerants for less than ten (10) days before sending the refrigerant to another site to be recycled for reuse, must:

(1) If recovering the refrigerant, recover the ignitable spent refrigerant using equipment that is certified for that type of refrigerant and appliance under § 82.36 of this chapter;

(2) Meet the applicable emergency preparedness and response requirements of 40 CFR part 261, subpart M; and

(3) Not speculatively accumulate the ignitable spent refrigerant per § 261.1(c) of this chapter.

(c) Persons receiving ignitable spent refrigerant from off-site to be recycled for reuse under this subpart must:

(1) Maintain certification by EPA under § 82.164 of this chapter;

(2) Meet the applicable emergency preparedness and response requirements of 40 CFR part 261, subpart M; and

(3) Starting with the calendar year beginning January 1, 2029, not speculatively accumulate the ignitable spent refrigerant per § 261.1(c) of this chapter.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

■ 11. The authority citation for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6924, 6925, 6927, 6939, and 6974.

Subpart A—General Information

■ 12. In § 270.1, add paragraph (c)(2)(xi) to read as follows:

§ 270.1 Purpose and scope of the regulations in this part.

* * * * *

(c) * * *

(2) * * *

(xi) Recyclers of ignitable spent refrigerants subject to regulation under 40 CFR part 266, subpart Q.

* * * * *

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

■ 13. The authority citation for part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6926, and 6939g.

Subpart A—Requirements for Final Authorization

■ 14. In § 271.1 amend paragraph (j)(2) by:

■ a. In table 1 adding the entry ''December 10, 2024'' in chronological order.

■ b. In table 2 adding the entry ''December 10, 2024'' in chronological order.

The additions read as follows:

§ 271.1 Purpose and scope.

* * * * *

(j) * * *

(2) * * *

TABLE 1—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Promulgation date	Title of regulation	**Federal Register** reference	Effective date
* *	* *	* *	* *
December 10, 2024	Standards for the Management of Ignitable Spent Refrigerants Recycled for Reuse.	[**Federal Register** citation of the final rule].	[Date of publication of the final rule in the **Federal Register**].

[1] These regulations implement HSWA only to the extent that they apply to tank systems owned or operated by small quantity generators, establish leak detection requirements for all new underground tank systems, and establish permitting standards for underground tank systems that cannot be entered for inspection.
[2] These regulations, including test methods for benzo(k)fluoranthene and technical standards for drip pads, implement HSWA only to the extent that they apply to the listing of Hazardous Waste No. F032, and wastes that are hazardous because they exhibit the Toxicity Characteristic. These regulations, including test methods for benzo(k)fluoranthene and technical standards for drip pads, do not implement HSWA to the extent that they apply to the listings of Hazardous Waste Nos. F034 and F035.
[3] The following portions of this rule are not HSWA regulations: §§ 264.19 and 265.19 for final covers.
[4] The following portions of this rule are not HSWA regulations: §§ 260.30, 260.31, 261.2.
[5] These regulations implement HSWA only to the extent that they apply to the standards for staging piles and to §§ 264.1(j) and 264.101(d) of this chapter.

TABLE 2—SELF-IMPLEMENTING PROVISIONS OF THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Effective date	Self-implementing provision	RCRA citation	**Federal Register** reference
* *	* *	* *	* *
December 10, 2024	Standards for the Management of Ignitable Spent Refrigerants Recycled for Reuse.	3001(d)(4) 3004(n)	[**Federal Register** citation of the final rule].

[1] Note that the effective date was changed to Jan. 29, 1986 by the Nov. 29, 1985 rule.
[2] Note that the effective date was changed to Sept. 22, 1986 by the Mar. 24, 1986 rule.

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 261, 262, 264, 265, 266, 270, 271, and 441

[EPA–HQ–OLEM–2023–0081; FRL 8687–02–OLEM]

RIN 2050–AH23

Hazardous Waste Generator Improvements Rule, the Hazardous Waste Pharmaceuticals Rule, and the Definition of Solid Waste Rule; Technical Corrections

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: The Environmental Protection Agency (the EPA or the Agency) is taking direct final action on a number of technical corrections that correct or clarify several parts of the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations. These technical corrections correct or clarify specific provisions in the existing hazardous waste regulations that were promulgated in the Hazardous Waste Generator Improvements rule, the Hazardous Waste Pharmaceuticals rule, and the Definition of Solid Waste rule. This rule also makes other minor corrections that fall within the same sections of the hazardous waste regulations but are independent of these three rules. Examples of the types of corrections being made in this rule include, but are not limited to, correcting typographical errors, correcting incorrect or outdated citations, making minor clarifications, and updating addresses.

DATES: This rule is effective on December 7, 2023, without further notice unless the EPA receives adverse comment by October 10, 2023. If the EPA receives adverse comment on any individual correction, we will publish a timely withdrawal in the **Federal Register** informing the public about the specific paragraph or amendment where the correction or clarification will not take effect.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2023–0081. All documents in the docket are listed on the *https://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* confidential business information (CBI) 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 form. Publicly available docket materials are available electronically through *https://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Brian Knieser, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0516, (*knieser.brian@epa.gov*) or Kathy Lett, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0517, (*lett.kathy@epa.gov*).

SUPPLEMENTARY INFORMATION:

I. Why is EPA using a direct final rule?

The EPA is publishing this rule without a prior proposed rule because we view this as a noncontroversial action and anticipate no adverse comment since the technical corrections are minor fixes and clarifications. However, in the ''Proposed Rules'' section of this **Federal Register** publication, we are publishing a separate document that will serve as the proposed rule to adopt the provisions in this direct final rule if adverse comments are received on this direct final rule. We will not institute a second comment period on this action. Any parties interested in commenting must do so at this time. For further information about commenting on this rule, see the **ADDRESSES** section of this document.

If the EPA receives adverse comment on any individual correction, we will publish a timely withdrawal in the **Federal Register** informing the public about the specific regulatory paragraph or amendment that will not take effect. The corrections that are not withdrawn will become effective on the date set out above. We would address all public comments in any subsequent final rule based on comments and new information submitted in response to the proposed rule.

II. Does this action apply to me?

Entities potentially affected by this action include hazardous waste generators, treatment, storage, and disposal facilities, healthcare facilities, reverse distributors, importers/exporters of hazardous waste, and users of the transfer-based exclusion to the definition of solid waste. Also affected are States and EPA Regions implementing the RCRA hazardous waste regulations.

III. What is the legal authority of this final rule?

This rule is authorized under sections 1004, 2002, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3010, 3017, and 3018 of the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6903, 6912, 6921, 6922, 6923, 6924, 6925, 6926, 6927, 6930, 6938, and 6939.

IV. Background

In the process of publishing in the **Federal Register** the three final rules that are the focus of this rulemaking, the EPA inadvertently made typographical errors, included incorrect citations, and finalized language that was unintentionally ambiguous. Similarly, while the Agency attempted to make conforming changes to all appropriate parts of the RCRA hazardous waste regulations when these three rules were promulgated, some were overlooked. The EPA has also identified a number of other regulations needing to be corrected that were not part of the three final rules that are the main focus of this rulemaking but are located in the same sections of the regulations. The Agency determined that including those additional corrections in this rulemaking would be an efficient use of Agency resources and provide sufficient benefit to merit their incorporation. These inadvertent errors and oversights have been the cause of some confusion on the part of the regulated community, as well as the Federal and State regulators implementing the hazardous waste regulatory program. Making these corrections will ease that confusion among the EPA's stakeholders.

This rule addresses these problems by correcting and clarifying the RCRA hazardous waste management regulations—specifically the general hazardous waste management system regulations under 40 CFR part 260, the hazardous waste identification regulations under 40 CFR part 261; the standards applicable to generators of hazardous waste in 40 CFR part 262; the standards for owners and operators of hazardous waste treatment, storage, and disposal facilities in 40 CFR part 264; the interim status standards for owner and operators of hazardous waste treatment, storage, and disposal facilities in 40 CFR part 265; the regulations for specific hazardous wastes and specific types of hazardous waste management facilities in 40 CFR part 266, including the regulations for hazardous waste pharmaceuticals in 40 CFR part 266, subpart P; the regulations for EPA-administered hazardous waste permit programs under 40 CFR part 270;

the requirements for authorization of State hazardous waste programs in 40 CFR part 271; and the dental office point source category regulations in part 40 CFR part 441.

This action was developed in accordance with EPA guidance on environmental justice. As a technical correction rulemaking, it does not have any disproportionately high and adverse human health or environmental effects on the programs, policies, or activities of minority populations (people of color) and low-income populations. It does not have adverse impact on other federal agencies, states, local governments, tribes, paperwork burdens, or children's health.

Similarly, because this rule consists entirely of technical corrections, it does not have any adverse impacts on climate change nor any state and federal climate adaptation programs.

Today's action makes over 100 technical corrections to 40 CFR parts 260–262, 264–266, 270–271, and 441. The discussion of technical corrections to the regulations below is organized by the rulemaking that initially made the changes. Where a technical correction does not stem directly from one of the three main rulemakings being corrected, it has been included where it makes most sense to do so by topic. In addition, the EPA provides a description and explanation of the technical corrections in the preamble to this direct final rule.

V. Corrections Related to the Regulatory Revisions Implemented by the Hazardous Waste Generator Improvements Rule

This section addresses technical corrections to revisions made as part of the Hazardous Waste Generator Improvements rule. The final rule, referred to as the Generator Improvements rule, was published in the **Federal Register** on November 28, 2016 (81 FR 85732) and revised the requirements for hazardous waste generators, a regulatory term that refers to any person, by site, whose act or process produces hazardous waste or whose act first causes a hazardous waste to become subject to regulation. The Generator Improvements rule included a reorganization and renumbering of the regulations for the management of hazardous waste by generators of that waste as well as revisions that both closed regulatory gaps and, where appropriate, provided flexibility in the regulations for certain management scenarios. The technical corrections described in this action include the correction of typographical errors, the correction of citations in the regulations that were not updated in the original Generator Improvements rule, and revisions to wording in the regulations that has caused confusion in the six years since the final rule was published.

The technical corrections in this section of the rule appear mostly in the hazardous waste generator regulations in part 262 of chapter 40 of the Code of Federal Regulations, but also in other hazardous waste provisions in 40 CFR parts 260, 261, 264, 265, 266, 270, and 271. There is also one citation updated in 40 CFR part 441.

Each of the technical corrections are discussed below. The preamble discusses typographical errors first, then updated citations, and finally wording changes. Within each section, the technical corrections are generally discussed in the order they appear in the regulations. However, to avoid repetition, similar technical corrections are discussed together in the preamble.

A. Typographical Errors

- Section 262.16(b) is revised to include a reference to § 262.16(c) in the list of provisions in this section describing when a small quantity generator can accumulate hazardous waste for more than 180 days. The reference to § 262.16(c) was inadvertently left off this list in the 2016 Generator Improvements rule.
- Section 262.16(b)(5) is revised to remove an ''of'' from the paragraph where it does not belong.
- Sections 262.16(b)(8)(iv)(A) and (B) are both revised to replace the internal cross reference to paragraph (a)(8)(ii) of this section to the correct citation: paragraph (b)(8)(ii) of this section.
- Section 262.17(a)(7)(i)(A) is revised to make the internal cross reference more specific by including the fourth paragraph level. The correct cross reference is to § 262.17(a)(7)(iv)(C), which describes what elements must be included in a large quantity generator's (LQG) training program. This revision also is consistent with the cross referencing in § 265.16, which applied to LQGs before the Generator Improvements rule reorganization.
- Section 262.17(a)(8)(iii)(A)(*4*) is revised to correct the regulation it references. The correct citation is paragraph (a)(8)(iii)(A)(*2*) of this section.
- Section 262.213(a)(1) is revised to replace a misplaced ''or'' with ''of.''
- Section 262.232(b)(4) is revised to remove the word ''waste'' from a place where it does not belong.
- Section 262.232(b)(6)(iv) is revised to add ''RCRA-'' to the term ''designated facility'' to match the language of parallel provisions in this section.
- Section 265.71 is revised by removing the comment to paragraph (c). The contents of that comment were incorporated into the main text of paragraph (c) by the Generator Improvements rule, but the comment was not removed at that time.

B. Missed Citation Updates and Changed Terminology

The Generator Improvements rule reorganized the hazardous waste generator regulations. Two of the main changes during this reorganization were moving the regulations that had been in § 261.5 into §§ 262.13 and 262.14 and reorganizing the regulations that had been in § 262.34 into three new sections: § 262.15 for satellite accumulation areas, § 262.16 for small quantity generators, and § 262.17 for large quantity generators.

The Generator Improvements rule also replaced the § 260.10 defined term ''conditionally exempt small quantity generator'' throughout the regulations with a new term that more accurately describes this category of generators: ''very small quantity generator.'' In addition, the rule defined the terms ''small quantity generator'' and ''large quantity generator.'' The previous regulations had distinguished small quantity generators from large quantity generators by stating with each mention that the former were generators that generated greater than 100 kilograms and less than 1,000 kilograms of hazardous waste in a calendar month and the latter were generators that generated equal to or greater than 1,000 kilograms of hazardous waste per calendar month.

The Generator Improvements rule also removed from the Code of Federal Regulations several obsolete sections of the generator regulations that are no longer in effect.

Although the EPA attempted to find each reference to obsolete regulatory citations and terminology when finalizing the 2016 Generator Improvements rule, several were missed. The EPA is taking this opportunity to correct those errors in the regulations and update them with the new citations and terms or remove the citations completely, if appropriate. In addition, the EPA is updating one physical address listed in the regulations.

- The definition of ''Final closure'' in § 260.10 is revised to update the citation from § 262.34 to §§ 262.16 and 262.17.
- Section 261.1(a)(1) is revised to remove the reference to hazardous waste produced by very small quantity generators because the regulations for

very small quantity generators are now in part 262.

- Section 261.4(e)(1) is revised to replace the references to quantity determinations in §§ 261.5 and 262.34(d) with a reference to the counting requirements in § 262.13 and the accumulation limits in § 262.16(b)(1).
- Section 261.11(c) is removed and reserved. The Generator Improvements rule finalized regulations that directly address generator category and generation limits for each category; thus, this paragraph is redundant and could result in confusion if not removed.
- Section 261.30(d) is revised to replace the reference to § 261.5 with a reference to § 262.13, Table 1, and the text of the paragraph is revised to use the same language as the title to Table 1: Generator Category Limits.
- Three references to § 262.34 in appendix IX to part 261 are replaced with references to §§ 262.15, 262.16, and 262.17, as applicable.
- Section 262.10(k) is revised to replace a reference to § 262.34 with a reference to §§ 262.15–262.17, and the standards in those sections are identified as conditions for exemption to be consistent with the rest of the generator standards.
- Section 262.10, Note 1, is revised to replace two references to § 262.34 with references to §§ 262.15–262.17.
- Section 262.42(a)(1) and (2) and (b) are revised to replace descriptions of generator categories (*e.g.,* ''generators of 1000 kilograms or greater of hazardous waste in a calendar month'') with either ''small quantity generator'' or ''large quantity generator,'' which were terms promulgated and/or updated in the 2016 Generator Improvements rule.
- Section 262.82(e)(2) is updated to reflect the current address for hand deliveries of submittals required in part 262, subpart H, for transboundary movements of hazardous waste for recovery or disposal.
- The definition of ''trained professional'' in § 262.200 is revised to specifically identify the training requirements that personnel at large, small, and very small quantity generators must comply with under part 262, subpart K, to be considered a trained professional.
- Section 262.212(e)(3) is revised to replace a reference to § 261.5(c) and (d) with a reference to § 262.13.
- Section 264.1(g)(3) is revised to add generators that are accumulating waste on site in compliance with the generator standards in subparts K and L of part 262 to the list of compliant generators to which part 264 does not apply.
- Sections 264.1(g)(12), 265.1(c)(15), and 270.1(c)(2)(ix) referring to the expired New York State Utility XL project are all removed and reserved.
- Section 264.15(b)(5) referring to the expired Performance Track program is removed and reserved.
- Section 264.1030(b)(3) is revised to replace a reference to § 262.34(a) with a reference to § 262.17.
- Section 264.1050(b)(2) is revised to replace a reference to § 262.34(a) with a reference to § 262.17.
- Section 266.100(c)(3) is revised to replace the term ''special requirements'' with ''conditions for exemption''; to replace the term ''conditionally exempt small quantity generator'' with ''very small quantity generator''; and to replace a reference to § 261.5 with a reference to § 262.14.
- Section 266.108 is revised to replace the term ''special requirements'' with ''conditions for exemption''; to replace the term ''conditionally exempt small quantity generator'' with ''very small quantity generator''; and to replace a reference to § 261.5 with a reference to § 262.14.
- Section 271.10(c) is revised to add a reference to § 262.15 because the previous reference to § 262.34 should have been updated in the 2016 Generator Improvements rule to also include § 262.15.
- Section 441.50(b)(3) is revised to replace a reference to § 261.5(g)(3) with a reference to § 262.14(a)(5).

C. Regulations To Be Reworded

In the time since the 2016 Hazardous Waste Generator Improvements rule was promulgated, the EPA has received feedback from State regulators implementing the rule, industry stakeholders, and others using the rule that some of the changes in the final rule are worded in a confusing way or could be interpreted as changing how the generator regulations work when the EPA did not discuss making such changes. In this section of the preamble, the EPA discusses and explains technical corrections to the regulations finalized by the 2016 Generator Improvements rule to address these concerns.

1. Notification Requirements in Section 3010 of RCRA (Multiple Locations)

In multiple generator provisions promulgated in the 2016 Generator Improvements rule, the EPA refers to the notification requirements in section 3010 of the RCRA statute specifically. For example, in some provisions we state that the requirements for a permitted facility, including the notification requirements in section 3010 of RCRA, do not apply to those entities that meet generator conditions for exemption from permitting. Elsewhere, we state that if a generator violates a specific condition, such as an LQG accumulating longer than 90 days without an extension, they become subject to the permitting requirements, including section 3010 of RCRA.

Since the promulgation of the rule, the EPA has been asked if regulatory language in the 2016 rule means that a generator of hazardous waste does not need to notify as a generator using EPA Form 8700–12, the Site ID form. The EPA did not intend this language to have this meaning—and in fact, small and large quantity generators continue to have the requirement in § 262.18 to complete and submit the Site ID form, notifying the EPA and the implementing State that they are in operation.

The EPA has revised the regulatory text in §§ 262.1; 262.10(a)(2); and 262.16; and five places in § 262.17 (§ 262.17(b), (c), (d), (e), and (f)) to make it clear that the generators that are operating in compliance with the generator regulations are exempted from the notification requirements in section 3010 of RCRA specifically as they pertain to treatment, storage, and disposal facilities.

2. Hazardous Waste Determination (§ 262.11(d) and (g))

In the 2016 Generator Improvements rule, the EPA made numerous revisions to the hazardous waste determination regulations in § 262.11 to incorporate long-standing guidance and policy. Section 262.11(c) used to read: ''For purposes of compliance with 40 CFR part 268, or if the waste is not listed in subpart D of 40 CFR part 261, the generator must then determine whether the waste is identified in subpart C of 40 CFR part 261 by either . . .''

The 2016 Generator Improvements rule moved this paragraph to § 262.11(d) and reworded the paragraph: ''The person then must also determine whether the waste exhibits one or more hazardous characteristics as identified in subpart C of 40 CFR part 261 by following the procedures in paragraph (d)(1) or (2) of this section, or a combination of both.''

Rewording the paragraph has led to questions about whether it is now necessary to identify all characteristics, even when identifying a listing that already addresses the characteristic. For example, F003 solvents are listed for ignitability. The 2016 revision of § 262.11(d) could be read so that a generator must also identify the D001 characteristic for an F003 spent solvent. This was not our intent. We have been

consistent in our interpretation that as long as the listed waste code addresses the constituents or properties that cause the waste to exhibit a characteristic, then it is not necessary to also identify the characteristic. This is still the case. We are adding two sentences to the end of § 262.11(d) to clarify that we did not change this interpretation. For the same reason, § 262.11(g) is being revised to reference § 262.11(d) so they will be consistent with one another.

3. Very Small Quantity Generators That Accumulate Above the Threshold (§ 262.14(a)(3) and (4))

In the 2016 Generator Improvements rule, the EPA made revisions in §§ 260.10, 262.13, 262.14, and 262.16 to clarify to the regulated community which regulations apply to hazardous waste generators based on (1) The quantity of hazardous waste they generate per month; and (2) the quantity of hazardous waste they accumulate on site at any given time. Among those revisions were two lists of standards that apply when a very small quantity generator (VSQG) exceeds the VSQG limit for hazardous waste accumulated on site at any one time: one kilogram of acute hazardous waste, 100 kilograms of residue from a cleanup of a spill of acute hazardous waste, or 1,000 kilograms of non-acute hazardous waste. (See § 262.14(a)(3) and (4))

Before 2016, these provisions were in § 261.5 and stated that: (1) Accumulated acute hazardous wastes and residues from clean ups of spills of acute hazardous waste would be subject to regulation under parts 262–266, 268, and parts 270 and 124, as well as the applicable notifications requirements in section 3010 of the RCRA statute, and (2) non-acute hazardous waste would be subject to the part 262 provisions applicable to small quantity generator waste, as well as parts 263–266, 268, and parts 270 and 124, and the application notification requirements in section 3010 of the RCRA statute.

Instead of pointing generators to a long list of provisions that could apply in these situations, the revised language in the 2016 Generator Improvements rule provided two specific lists of the provisions that apply to the waste when a VSQG exceeds the accumulation threshold: one for acute hazardous wastes and one for non-acute hazardous wastes. However, the lists were focused on the conditions for exemption, and both left out several provisions that had been covered by the previous language.

This rule revises both lists—in § 262.14(a)(3) and (4)—to restore the independent requirements that were inadvertently left out of the lists, including notification; preparation and use of the Uniform Hazardous Waste Manifest when shipping the waste off site; and complying with pre-transport requirements, recordkeeping and reporting requirements, and transboundary shipment requirements.

A VSQG that is notifying because it exceeded the accumulation threshold retains its VSQG category and prepares and submits EPA Form 8700–12 (the Site ID form) as a ''very small quantity generator.''

4. Accumulation Limit for Small Quantity Generators Generating Acute Hazardous Waste (§ 262.16(b)(1))

The 2016 Generator Improvements rule established definitions for very small, small, and large quantity generators, reorganized the regulations for these categories of generators, and clearly distinguished the generator categories—determined by how much hazardous waste is generated per calendar month at a site—from the conditions for exemption that specify limits for how much hazardous waste small and very small quantity generators can accumulate on site at any one time.

However, the small quantity generator conditions for exemption include an accumulation limit of 6,000 kilograms for non-acute hazardous waste but do not specify an accumulation limit for acute hazardous waste.

In the original 1980 hazardous waste generator regulations, there were only two categories of hazardous waste generator: small (generating less than 1,000 kilograms of hazardous waste per month) and large (generating more than 1,000 kilograms of hazardous waste per month). These pre-1986 small quantity generators had a total on-site hazardous waste accumulation limit of 6,000 kilograms of non-acute hazardous waste and one kilogram of acute hazardous waste. The 1986 rule that established the category and specific requirements for those generating between 100 kilograms and 1,000 kilograms per month (small quantity generators) (51 FR 10146; March 24, 1986) implemented the changes to the hazardous waste program required by the Hazardous and Solid Waste Amendments of 1984 (HSWA) and established a new category of ''conditionally exempt small quantity generator'' for those generating less than 100 kilograms of non-acute hazardous waste per month.

The scope of HSWA and the new regulations for conditionally exempt small quantity generators did not include acute hazardous waste. Therefore, generators generating less than one kilogram of acute hazardous waste per month are conditionally exempt small quantity generators and those generating more than one kilogram of acute hazardous waste per month are large quantity generators. There is no separate small quantity generator category based solely on generation of acute hazardous waste.

The EPA clarified the distinctions between the three generator categories in the 2016 Generator Improvements rule and stated that a small quantity generator can only generate up to one kilogram of acute hazardous waste in a calendar month, but it was not clear in the new language whether there is a limit on the amount of acute hazardous waste a small quantity generator can accumulate on site at any one time.

Consistent with what has been historically allowed for generators of small amounts of acute hazardous waste, the EPA is revising § 262.16(b)(1) to clarify that the acute hazardous waste accumulation limit for a small quantity generator is one kilogram.

5. Accumulation in Tanks (§ 262.17(a)(2))

Section 262.17(a)(2) describes the requirements for hazardous waste that LQGs accumulate in tanks. This section was reorganized with some wording changes in the 2016 Generator Improvements rule. Section 262.17(a)(2) used to be in § 262.34(a)(1)(ii), where it was clear that the LQG must comply with the applicable requirements of subparts J, AA, BB, and CC of 40 CFR part 265 except §§ 265.197(c) and 265.200. The EPA was informed by stakeholders that the revised regulation is not as clear as it had been previously and is therefore revising the paragraph by replacing the offsetting commas with a set of parentheses to ensure clarity about which requirements apply to LQGs that accumulate hazardous waste in tanks.

6. Closure of a Waste Accumulation Unit (§ 262.17(a)(8)(i) Introductory Text and (a)(8)(i)(A))

The Generator Improvements rule added a requirement that LQGs undergoing closure of a hazardous waste accumulation unit (*e.g.,* tank system, container accumulation area) must notify the EPA (or the authorized State). Section 262.17(a)(8)(i) describes the standards for notification when they are just closing one single accumulation unit and not all their accumulation units. In this case, LQGs have two options. They can submit the Site ID form notifying the EPA of a unit's closure at the time they close the unit (as per § 262.17(a)(8)(i)(B)) or they can put a notice in their operating record

and then, at a later date, when all the accumulation units are closing, include the earlier unit in the broader closure notification (as per § 262.17(a)(8)(i)(A)). The EPA is revising the language in this section to more clearly describe that these paragraphs apply specifically to closure of a waste accumulation unit but not the whole facility.

7. Exception Reporting for an Episodic Event (§ 262.232(a)(5))

The 2016 Generator Improvements rule added new provisions and conditions under subpart L (Alternate Standards for Episodic Generation) for very small and small quantity generators allowing them to hold episodic generation events one time per year if they experience an event that pushes them above the generation threshold for their normal generator category for that calendar month. (A second event may be allowed but must be approved by the EPA or the authorizing State.)

Under the episodic event provisions, very small quantity generators must comply with certain conditions including notification; labeling of tanks and containers; managing waste in a manner that minimizes fire, explosions, or releases; and transporting the hazardous waste to a RCRA treatment, storage, and disposal facility or a hazardous waste recycler using the Uniform Hazardous Waste Manifest (EPA Form 8700–22). The intent of these conditions was to ensure that any hazardous waste from an episodic event is sent to an appropriate hazardous waste designated facility under the protections of the manifest system.

However, in the regulations finalized by the 2016 Generator Improvements rule for very small quantity generators holding episodic events, the EPA neglected to include a reference to § 262.44 of the generator regulations—recordkeeping requirements for small quantity generators—an important part of the manifest's cradle-to-grave tracking. The EPA always intended for the entire manifest tracking system to apply to hazardous waste from episodic events being held by very small quantity generators.

The EPA is revising § 262.232(a)(5) to include a reference to § 262.44, which includes maintaining records of manifests and hazardous waste determinations, completing an exception report if the generator does not receive a copy of its manifest from the designated facility indicating that the waste arrived within 60 days from the date upon which the waste was accepted by the initial transporter, and complying with requests from the Administrator for additional reports under sections 2002(a) and 3002(a)(6) of RCRA.

8. Episodic Generation for Small Quantity Generators (§ 262.232(b)(4)(ii)(C))

Section 262.232(b) describes the conditions that apply when a small quantity generator is holding an episodic event. Generators must label accumulation units with the date the episodic event begins to ensure that all hazardous waste from the event is transported off site to a RCRA-designated facility within the 60 days allowed for the entire episodic event. This standard was clear in the preamble to the 2016 Generator Improvements final rule and in the parallel regulations for VSQGs and for small quantity generators accumulating hazardous waste in containers, but the 2016 regulatory language erroneously indicated that small quantity generators accumulating hazardous waste in tanks should mark them with the day the period of accumulation begins (*i.e.,* the day that hazardous waste started accumulating in that tank), as opposed to the day the event began. The EPA is revising the regulatory language to match its intent, as indicated in the 2016 preamble and the other parallel sections of the episodic generation regulations.

VI. Corrections Related to the Regulatory Revisions Implemented by the Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine Rule

This section addresses technical corrections to revisions made as part of the Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine rule. The final rule, referred to as the Hazardous Waste Pharmaceuticals final rule, was published in the **Federal Register** on February 22, 2019, (84 FR 5816) and added part 266 subpart P to title 40, chapter I, of the Code of Federal Regulations. The revisions described in this action include correction of typographical errors, the correction of citations in the regulations that were not updated in the original Hazardous Waste Pharmaceuticals final rule, revisions to wording in the regulations to provide consistency, and revisions to wording in the regulations that have caused confusion in the four years since the final rule was published.

All but three of the technical corrections appear in part 266, subpart P. The technical corrections that are not in part 266, subpart P, are in §§ 264.72 and 265.72 and Table 1 of § 271.1. Each of the technical corrections are discussed below. Generally, the technical corrections are discussed in the order they appear in the regulations. However, to avoid repetition, similar technical corrections are discussed together, even if that means that they are taken out of order.

A. Manifest Discrepancies (§§ 264.72 and 265.72)

Sections 264.72(a)(3) and 265.72(a)(3) are both being revised to include a reference to the new empty container standards in § 266.507 that were added as a component of part 266, subpart P. The current regulatory language in §§ 264.72(a) and 265.72(a) references the empty container standards in § 261.7(b). We are updating the references to include the new empty container standards in § 266.507 as well.

B. Applicability (§ 266.501)

Section 266.501(d)(2) of the Applicability section of part 266, subpart P, is being amended to correct a typographical error. Specifically, the regulatory citation § 262.502(a) is being revised to § 266.502(a). In fact, the citation § 262.502(a) does not exist.

C. Lab Pack Accumulation (§§ 266.502(d)(4) and 266.510(c)(4)(vi))

1. Overview of Technical Corrections Related to Lab Packing Hazardous Waste Pharmaceuticals

Sections 266.502(d)(4) and 266.510(c)(4)(vi) are both being amended to insert the phrase, ''or because it is prohibited from being lab packed due to § 268.42(c).'' Section 266.502(d)(4) is within the healthcare facility standards for non-creditable hazardous waste pharmaceuticals. Section 266.510(c)(4)(vi) is within the reverse distributor standards for evaluated hazardous waste pharmaceuticals. These changes clarify that non-creditable and evaluated hazardous waste pharmaceuticals that are prohibited from being lab packed for incineration must be accumulated in separate containers at healthcare facilities and reverse distributors, respectively. These amendments are consistent with guidance the EPA issued after the rule was published in February 2019 and posted on the web page, Frequent Questions about the Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine final rule.[1]

[1] *https://www.epa.gov/hwgenerators/frequent-questions-about-management-standards-hazardous-waste-pharmaceuticals-and#landdisposal.*

In the Frequent Questions, we explained that in the Hazardous Waste Pharmaceuticals final rule the EPA required that healthcare facilities and reverse distributors segregate certain metal-bearing hazardous waste pharmaceuticals in separate containers. The Agency's reasoning was that, while combustion is the required treatment standard under the Land Disposal Restrictions (LDRs) for most hazardous waste pharmaceuticals, the combustion of a few metal-bearing hazardous wastes is prohibited. Therefore, a healthcare facility or reverse distributor must accumulate those particular metal-bearing hazardous waste pharmaceuticals in a separate container at the initial point of accumulation, and label them with the appropriate hazardous waste codes in order to prevent them from being combusted inadvertently. While the final rule mentions the LDR dilution prohibition as one reason for accumulating certain metal-bearing hazardous waste pharmaceuticals separately, we inadvertently omitted a reference to the LDR lab-pack regulations as a reason for accumulating certain hazardous waste pharmaceuticals separately.

In § 266.510(c)(4)(vi), we included a parenthetical with an example of a metal-bearing hazardous waste pharmaceutical that was prohibited from being combusted due to the dilution prohibition of § 268.3(c). The example we included was arsenic trioxide. Including the example caused confusion, leading some to think that arsenic trioxide was the only metal-bearing hazardous waste pharmaceutical that had to be segregated. Therefore, we are replacing the example in the parenthetical with a reference to the complete list of metal-bearing waste codes in appendix XI to part 268. Similarly, we are adding a second parenthetical that will reference appendix IV to part 268 following the new language about the lab pack prohibition. For consistency, we are adding both of these parentheticals to § 266.502(d)(4).

2. Detailed Explanation of Regulatory Changes Related to Lab Packing Hazardous Waste Pharmaceuticals

The standards for healthcare facilities managing non-creditable hazardous waste pharmaceuticals include a provision related to metal-bearing pharmaceuticals that are subject to the dilution prohibition under the LDRs in § 268.3. Specifically, § 266.502(d)(4) of the Hazardous Waste Pharmaceuticals final rule states that a "healthcare facility may accumulate non-creditable hazardous waste pharmaceuticals and non-hazardous non-creditable waste pharmaceuticals in the same container, except that non-creditable hazardous waste pharmaceuticals prohibited from being combusted because of the dilution prohibition of § 268.3(c) must be accumulated in separate containers and labeled with all applicable hazardous waste numbers (*i.e.,* hazardous waste codes)."

The standards for reverse distributors managing evaluated hazardous waste pharmaceuticals includes an analogous provision. Specifically, § 266.510(c)(4)(vi) states that a "reverse distributor . . . must . . . [a]ccumulate evaluated hazardous waste pharmaceuticals that are prohibited from being combusted because of the dilution prohibition of § 268.3(c) (*e.g.,* arsenic trioxide (P012)) in separate containers from other evaluated hazardous waste pharmaceuticals at the reverse distributor."

The healthcare facility standards and the reverse distributor standards both cite the LDR dilution prohibition found in § 268.3(c), which provides that "combustion of the hazardous waste codes listed in Appendix XI" to part 268 is "prohibited, unless the waste, at the point of generation, or after any bona fide treatment such as cyanide destruction prior to combustion, can be demonstrated to comply with one or more" of the specific criteria (unless otherwise specifically prohibited from combustion). The criteria follow:

(1) The waste contains hazardous organic constituents or cyanide at levels exceeding the constituent-specific treatment standard found in § 268.48;

(2) The waste consists of organic, debris-like materials (*e.g.,* wood, paper, plastic, or cloth) contaminated with an inorganic metal-bearing hazardous waste;

(3) The waste, at point of generation, has reasonable heating value such as greater than or equal to 5000 BTU per pound;

(4) The waste is co-generated with wastes for which combustion is a required method of treatment;

(5) The waste is subject to Federal and/or State requirements necessitating reduction of organics (including biological agents); or

(6) The waste contains greater than 1% Total Organic Carbon (TOC).

Appendix XI to part 268 is a table of 51 metal-bearing hazardous wastes, some of which are, or are ingredients in, pharmaceuticals. In some cases, metal-bearing hazardous waste pharmaceuticals contain more than 1% total organic carbon (TOC), in which case they can be combusted and they do not need to be accumulated separately (see § 268.3(c)(6)). Other hazardous waste pharmaceuticals that do not contain more than 1% TOC (or do not meet any other exceptions in §§ 268.3(c)(1) through (5)), must be accumulated separately in accordance with §§ 266.502(d)(4) and 266.510(c)(4)(vi) because they are prohibited from being combusted due to the dilution prohibition. Arsenic trioxide is an example of a hazardous waste pharmaceutical that does not contain >1% TOC and therefore must be accumulated separately.

In some cases, a healthcare facility or reverse distributor will use lab packs for its hazardous waste pharmaceuticals. Lab packs, also known as "overpacked drums," are a commonly used form of waste packaging for a variety of hazardous wastes—not just hazardous waste pharmaceuticals—where many small containers such as vials or bottles containing compatible hazardous waste are placed into a larger container with sorbent material. In some cases, lab packs are used by generators as accumulation containers at the initial point of accumulation of the hazardous waste. More often, hazardous waste is lab packed later by a vendor, as the hazardous waste is prepared to be shipped off site for treatment and disposal. Lab packs are typically treated by combustion.

In many cases, the use of lab packs by healthcare facilities and reverse distributors for hazardous waste pharmaceuticals is allowed per the alternative LDR treatment standard of § 268.42(c), which provides that, "as an alternative to the otherwise applicable subpart D treatment standards, lab packs are eligible for land disposal," provided the specific requirements are met. The requirements follow:

(1) The lab packs comply with the applicable provisions of 40 CFR 264.316 and 265.316;

(2) The lab pack does not contain any of the wastes listed in appendix IV to part 268;

(3) The lab packs are incinerated in accordance with the requirements of 40 CFR part 264, subpart O, or 40 CFR part 265, subpart O; and

(4) Any incinerator residues from lab packs containing D004, D005, D006, D007, D008, D010, and D011 are treated in compliance with the applicable treatment standards specified for such wastes in subpart D of part 268.

However, the 17 hazardous wastes codes in appendix IV to part 268 are not eligible for this alternative LDR treatment standard, and thus are prohibited from being lab packed for incineration (see § 268.42(c)(2)). As shown in the table below, there are

several hazardous waste pharmaceuticals among the 17 hazardous wastes listed in appendix IV to part 268. These hazardous waste pharmaceuticals are prohibited from being included in lab packs that will be incinerated under the alternative LDR treatment standard; therefore, the result is that these also must be accumulated separately, just like the hazardous waste pharmaceuticals that are prohibited from being incinerated due to the dilution prohibition.

TABLE 1—EXAMPLES OF HAZARDOUS WASTE PHARMACEUTICALS LISTED IN APPENDIX IV TO PART 268—WASTES EXCLUDED FROM LAB PACKS UNDER THE ALTERNATIVE TREATMENT STANDARDS OF § 268.42(c)

Hazardous waste code	Hazardous waste chemical name
D009*	Mercury (toxicity characteristic).
P012*	Arsenic Trioxide.
P076	Nitric Oxide.
U151*	Mercury.

*Also appears in Appendix XI to Part 268—Metal Bearing Wastes Prohibited From Dilution in a Combustion Unit According to 40 CFR 268.3(c).

The regulatory language in §§ 266.502(d)(4) and 266.510(c)(4)(vi) is being amended to include this additional cross-reference to the prohibition on lab packing certain hazardous waste pharmaceuticals for incineration. The prohibition in § 268.42(c)(2) applies independent of the changes finalized by the Hazardous Waste Pharmaceuticals final rule. We are including this additional reference for clarity and for the reader's convenience.

3. Marking Lab Packs for Shipping

Although there are no corresponding regulatory technical corrections, we would like to highlight a related matter about marking lab packs for shipping. Under subpart P, a healthcare facility that is accumulating and shipping non-creditable hazardous waste pharmaceuticals to a designated facility is required to mark its containers with the words "Hazardous Waste Pharmaceuticals," and it is not necessary to mark those containers with individual hazardous waste codes (see § 266.502(e)). However, be aware that the shipping standards for non-creditable and evaluated hazardous waste pharmaceuticals require that lab packs containing D004 (arsenic), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D010 (selenium) or D011 (silver) must be marked with the EPA hazardous waste numbers (see § 266.508(a)(1)(iii)(C)). These specific metals must be identified because § 268.42(c)(4) requires any incinerator residues from lab packs that contain any of these specific metals to undergo further treatment to meet applicable treatment standards prior to land disposal.

D. EPA Hazardous Waste Numbers (§§ 266.502, 266.508, and 266.510)

1. Clarifying Terminology

We are revising the regulatory language in six places to use consistent language when referring to EPA hazardous waste numbers, and to consistently reflect that EPA hazardous waste numbers are often referred to as hazardous waste codes. In each case, the regulatory language is being revised to read, ". . . applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes)."

The six changes appear in the following four sections of the regulations:

(1) One change in § 266.502(d)(4);

(2) two changes in § 266.508(a)(1)(iii)(C);

(3) one change in § 266.508(a)(2)(i);

(4) two changes in § 266.510(c)(5).

2. Using Hazardous Waste Codes on the Hazardous Waste Manifest

We are amending § 266.508(a)(2)(ii) to insert a sentence at the end (using the same phrasing discussed above) clarifying that a healthcare facility may also include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–12, in addition to the PHARMS or PHRM code.

This technical correction is a restatement of preamble from the final rule and is also consistent with guidance that the EPA has provided since the final rule was published. This change pertains to the standards for healthcare facilities shipping non-creditable hazardous waste to a designated facility (*e.g.,* TSDF). The final rule requires the use of the word "PHARMS" on Item 13 of the manifest (see section VII.M. of this preamble for additional detail). In the preamble of the final rule, when discussing container labeling standards for non-creditable hazardous waste pharmaceuticals at healthcare facilities, the EPA stated that "the Agency is not finalizing a requirement of healthcare facilities to label containers of non-creditable hazardous waste pharmaceuticals with hazardous waste codes, . . . although a vendor could include such a requirement in its contract with a healthcare facility." [2]

Since then, the EPA reinforced this statement in a Frequent Question [3] that is posted on our website, as well as in a memorandum.[4] The last paragraph of the memorandum states:

> Although healthcare facilities operating under subpart P are not required to include all applicable RCRA hazardous waste codes when manifesting non-creditable hazardous waste pharmaceuticals, the EPA indicated in the preamble to the final rule that we do not object if healthcare facilities or their vendors choose to include RCRA hazardous waste codes on manifests in addition to PHRM/PHARMS (see page 5877). Including all applicable RCRA hazardous waste codes on the manifest when shipping non-creditable hazardous waste pharmaceuticals could help receiving facilities better understand the wastes and determine the best course of management. In addition, we recommend for manifested non-creditable hazardous waste pharmaceuticals shipped from a healthcare facility operating under subpart P but passing through a state or going to a TSDF in a state that has not yet adopted subpart P, that the healthcare facility/vendor check with those states regarding whether they require all applicable waste codes to be on the manifest. Further, the regulated community should be aware that as authorized states adopt and become authorized for part 266 subpart P, it is possible that they may choose to be more stringent and require all hazardous waste codes when healthcare facilities manifest non-creditable hazardous waste pharmaceuticals.

[2] 84 FR 5816, February 22, 2019. See page 5877.

[3] *https://www.epa.gov/hwgenerators/frequent-questions-about-management-standards-hazardous-waste-pharmaceuticals-and#e2.*

[4] From Johnson to EPA Regions, December 19, 2019, RCRA Online #14919.

E. Calendar Days (§§ 266.502 and 266.510)

We are adding the word ''calendar'' to modify the word ''days'' in 15 citations within part 266, subpart P. The word ''calendar'' is already used to modify the word ''days'' in seven citations within part 266, subpart P, but we were not consistent throughout the subpart P regulatory language. In the preamble to the proposed and final rules, however, the term ''calendar days'' is used consistently such that the EPA believes our intention was clear that whenever ''days'' is mentioned, it refers to ''calendar days.'' Thus, these 15 regulatory citations are being amended for clarity and consistency.

Five of the corrected regulatory citations are in the healthcare facility standards for non-creditable hazardous waste pharmaceuticals in § 266.502. The other ten corrected regulatory citations are in the reverse distributor standards for evaluated hazardous waste pharmaceuticals in § 266.510(c). The 15 citations that are being amended to include the word ''calendar'' are:

(1) Section 266.502(h);
(2) Section 266.502(h)(3);
(3) Section 266.502(h)(4);
(4) Section 266.502(i)(2)(i)(A);
(5) Section 266.502(i)(2)(ii)(A);
(6) Section 266.510(b)(1);
(7) Section 266.510(b)(2);
(8) Section 266.510(c)(2);
(9) Section 266.510(c)(7);
(10) Section 266.510(c)(7)(iii);
(11) Section 266.510(c)(7)(iv);
(12) Section 266.510(c)(9)(ii)(A)(*1*);
(13) Section 266.510(c)(9)(ii)(A)(*2*);
(14) Section 266.510(c)(9)(ii)(B)(*1*);
(15) Section 266.510(c)(9)(ii)(B)(*2*).

F. Rejected Shipments (§§ 266.502 and 266.510)

We are replacing the word ''returned'' with ''rejected'' in two places in § 266.502(h) when discussing the procedures for the management of rejected shipments of non-creditable hazardous waste pharmaceuticals. Additionally, we are removing the words ''or returned'' from a third place in § 266.502(h).

This is being done for consistency and clarity. Given that the title of § 266.502(h) is ''Procedures for healthcare facilities for managing rejected shipments of non-creditable hazardous waste pharmaceuticals,'' it is more appropriate to consistently refer to the rejected loads as ''rejected'' rather than ''returned.'' We are making identical changes to the procedures for reverse distributors managing rejected shipment that are in § 266.510(c)(7).

G. Standards for Healthcare Facilities Managing Potentially Creditable Hazardous Waste Pharmaceuticals (§ 266.503)

We are amending § 266.503(b)(1) to be consistent with § 266.502(l)(1). Sections 266.502(l)(1) and 266.503(b)(1) each contain one of the conditions that receiving healthcare facilities must meet when accepting hazardous waste pharmaceuticals from an off-site VSQG healthcare facility. Section 266.502 pertains to non-creditable hazardous waste pharmaceuticals, while § 266.503 pertains to potentially creditable hazardous waste pharmaceuticals. For the reader's convenience, when drafting § 266.502(l)(1), we included a parenthetical with the definition of ''control,'' but we did not do the same in § 266.503(b)(1). We are amending § 266.503(b)(1) to include the same parenthetical with the definition of ''control'' that appears in § 266.502(l)(1). In both cases, the definition of ''control'' originates from an exclusion from the definition of solid waste that appears in § 261.4(a)(23)(i)(B).

H. Off-Site Collection of Hazardous Waste Pharmaceuticals Generated by Healthcare Facilities That Are VSQGs That Are Not Operating Under Part 266, Subpart P (§ 266.504)

There are three changes to § 266.504. First, the heading of § 266.504 is being amended by adding ''that are not operating under this subpart.'' Since part 266, subpart P, was published in 2019, there has been some confusion about the applicability of § 266.504. A healthcare facility must count all of its hazardous waste generated in a calendar month—including hazardous waste pharmaceuticals—in determining whether it is required to operate under part 266, subpart P. A healthcare facility that generates above VSQG amounts of hazardous waste must operate under subpart P. A healthcare facility that generates below VSQG amounts of hazardous waste is not required to operate under subpart P, but may choose to opt in. While the preamble to the final rule made it clear that all of the optional provisions in § 266.504 only apply to VSQG healthcare facilities that have not opted into part 266, subpart P,[5] the heading was not as clear. Therefore, we are amending the heading of § 266.504 to make it clear that the four optional provisions in § 266.504 are only available to VSQG healthcare facilities that have not opted into subpart P and therefore are not operating under subpart P. Conversely, a VSQG healthcare facility that opts into part 266, subpart P, would no longer be able to use the optional provisions in § 266.504.

We reiterate that a VSQG healthcare facility that elects to use any of the optional provisions in § 266.504 will not be considered to be opting into part 266, subpart P, and does not need to notify as a healthcare facility.

The second change to § 266.504 is correcting the spelling of off site. In § 266.504(b), the word ''off-site'' appears twice. The first time it appears it is correctly hyphenated because it is modifying the word ''collection.'' However, the second time it appears it is incorrectly hyphenated because it is being used as a noun. Section 266.504(b) is being revised to remove the hyphen from the word ''off-site'' the second time it appears, so that ''off-site'' becomes ''off site.''

The third change is that § 266.504(b) is being amended by replacing the term ''healthcare facility'' with the word ''generator'' toward the end of the paragraph. Normally the RCRA regulations do not allow a generator to send its waste off site to another generator. However, in the 2015 Generator Improvements proposed rule, we included a provision to allow VSQGs to consolidate their hazardous waste off site at a large quantity generator, provided certain conditions are met. The Hazardous Waste Pharmaceuticals rule, which was published the same day as the Generator Improvements proposed rule, included a similar off-site consolidation provision. Specifically, in the Hazardous Waste Pharmaceuticals rule we proposed § 266.504(b) to allow a healthcare facility that is a VSQG to send its hazardous waste pharmaceuticals off site to another healthcare facility provided certain similar conditions are met. When the Generator Improvements final rule was published on November 28, 2016, we finalized the off-site consolidation provision. When we finalized the Hazardous Waste Pharmaceuticals final rule on February 22, 2019, we provided options within the off-site consolidation provision of § 266.504(b), allowing VSQG healthcare facilities to use either version of the off-site consolidation provision: the version in the Generator Improvements final rule, or the version in the Hazardous Waste Pharmaceuticals final rule. As stated in the preamble of the Hazardous Waste Pharmaceuticals final rule, we included ''added flexibility for VSQGs to meet the consolidation provisions that were added as part of the 2016 Hazardous Waste Generator Improvements final

[5] See 84 FR 5858; February 22, 2019.

rule in lieu of the subpart P off-site consolidation provisions. In this case, the receiving LQG would have to meet the conditions in § 262.17(f) while the VSQG healthcare facility would have to meet the conditions in § 262.14(a)(5)(viii).'' The regulations in § 266.504(b) state (emphasis added), ''A healthcare facility that is a very small quantity generator for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste may send its hazardous waste pharmaceuticals off-site to another *healthcare facility,* provided [. . .].'' The final rule included two options for complying with the off-site consolidation provisions and they are set out in § 266.504(b)(1) and (2).

In adding these options, however, we neglected to remove the term ''healthcare facility'' from the introductory text of paragraph (b) when describing to whom the VSQG could send its hazardous waste pharmaceuticals. If a VSQG healthcare facility is using the subpart P off-site consolidation option described in § 266.504(b)(1), then it must send its hazardous waste pharmaceuticals to a healthcare facility that is operating under subpart P. On the other hand, if a VSQG healthcare facility is using the off-site consolidation option described in § 266.504(b)(2), then it must send its hazardous waste pharmaceuticals to an LQG that meets the conditions under § 262.17(f). It was not our intention to require the receiving LQG to be a healthcare facility. Therefore, we are removing the term ''healthcare facility'' from the final line of § 266.504(b) and replacing it with the word ''generator.''

I. Prohibition on Sewering Hazardous Waste Pharmaceuticals (§ 266.505)

The second and final sentence of § 266.505 currently reads, ''Healthcare facilities and reverse distributors remain subject to the prohibitions in 40 CFR 403.5(b)(1).'' We are revising the citation 40 CFR 403.5(b)(1) to 40 CFR 403.5(b). Section 403 is part of the Clean Water Act (CWA) regulations; specifically, it is part of the Effluent Guidelines and Standards. Section 403.5 is entitled ''National pretreatment standards: Prohibited discharges.'' Section 403.5(b) includes a list of eight ''Specific prohibitions.'' Healthcare facilities and reverse distributors remain subject to all the prohibitions in 40 CFR 403.5(b), not just the prohibition in 40 CFR 403.5(b)(1). The cross-reference to the CWA regulations did not appear in the proposed rule; we added it into the final regulations in response to comments. In the preamble to the final rule, we used the correct citation, § 403.5(b).[6]

J. Conditional Exemption for Hazardous Waste Pharmaceuticals That Are Also Controlled Substances (§ 266.506)

We are revising the title of § 266.506 and paragraph (a)(2) of § 266.506 to remove the reference to take-back events or programs. There are several methods of providing household pharmaceutical take-backs. For example, retail pharmacies can amend their DEA registration to become DEA authorized collectors and install collection receptacles (often referred to as kiosks) for take-back of household pharmaceuticals. Another example is DEA's very popular national take-back days that are scheduled for the last Saturday in April and October each year. ''Take-back events'' and ''take-back programs'' are terms that are typically used to refer to take-back methods that require the involvement of law enforcement. Subpart P applies to healthcare facilities (*e.g.,* retail pharmacies) and reverse distributors; it does not apply to law enforcement. Since subpart P does not apply to law enforcement, we should not have included a reference to take-back methods that involve law enforcement. Therefore, to help reduce confusion, we are removing the reference to take-back events and programs.

Our memorandum from September 11, 2018, for law enforcement conducting take-backs, continues to apply. It explains the regulatory status of household pharmaceuticals collected by law enforcement and the type of permitted incinerators that may be used to destroy the collected household pharmaceuticals.[7] We are also revising § 266.506(b)(3) to replace the periods with ''; or'' after paragraphs (b)(3)(iii) and (iv) to be consistent with how the rest of the list is punctuated.

K. Residues of Hazardous Waste Pharmaceuticals in Empty Containers (§ 266.507)

We are making several corrections and clarifications to the empty container standards in § 266.507. Each is explained separately below.

1. Intravenous (IV) Bags

The first sentence of § 266.507(c) defines when an IV bag is considered ''RCRA empty''; that is, when the contents have been fully administered to a patient. The second sentence of § 266.507(c) sets out how IV bags that are not RCRA empty must be managed. At the end of the second sentence, however, we include a clause that references the § 261.7(b)(1) definition of ''RCRA empty'' and we allow it to be used as an alternative, but only for IV bags that contain non-acute hazardous waste pharmaceuticals. We are moving the clause that references § 261.7(b)(1) to the end of the first sentence so the first sentence of § 266.507(c) will include both definitions of when an IV bag is considered RCRA empty.

2. Other Containers, Including Delivery Devices

We are amending the opening of § 266.507(d) by inserting the words ''At healthcare facilities operating under this subpart.'' We are making this change for two reasons. First, while § 266.507(a) through (c) pertain to specific types of containers at healthcare facilities, § 266.507(d) is a catch-all for other types of containers (including delivery devices) at healthcare facilities that are not addressed specifically by paragraphs (a) through (c). Given that the new definitions of ''empty containers'' in § 266.507 apply beyond healthcare facilities and reverse distributors operating under subpart P, ''other containers'' could be read very broadly to include large containers of hazardous waste pharmaceuticals, such as 55-gallon drums. This was not our intent. Rather, our intent with § 266.507(d) was to address ''other containers'' that are commonly found in the healthcare setting. This is clear from the examples we include at the end of § 266.507(d): inhalers, aerosol cans, nebulizers, tubes of ointments, gels, or creams.

The second reason we are amending the opening of § 266.507(d) is to clarify that it does not apply to healthcare facilities that are VSQGs, unless the VSQG healthcare facility has opted into subpart P. The current regulatory language in § 266.507(d) could be read to mean that any entity, including healthcare facilities that are VSQGs, must manage their non-empty containers of hazardous waste pharmaceuticals as non-creditable hazardous waste pharmaceuticals, even if they are not operating under subpart P. This was not our intent. Healthcare facilities that are VSQGs have the option of operating under subpart P with respect to their hazardous waste pharmaceuticals, including their non-empty containers.

3. Managing Non-Empty Containers

For a similar reason, we are inserting the words ''At healthcare facilities operating under this subpart'' into the second sentence of both § 266.507(b)

[6] 84 FR 5816, February 22, 2019. See preamble on page 5894.

[7] From Wheeler to U.S. Law Enforcement, September 11, 2018, RCRA Online #14906.

and (c). While the revised definitions of "empty containers" in § 266.507 apply to any hazardous waste generator, regardless of whether it is a healthcare facility operating under subpart P, the portions of § 266.507(b) through (d) that address how to manage non-empty containers of hazardous waste pharmaceuticals only apply to a healthcare facility operating under subpart P. If a reverse distributor is using the revised definitions of "empty containers" in § 266.507, it must manage non-empty containers as evaluated hazardous waste pharmaceuticals. If another type of facility is using the revised definitions of "empty containers" in § 266.507 and is not operating under subpart P, it must continue to manage non-empty containers as hazardous waste, under the applicable regulations (*e.g.,* part 262).

Finally, we note that a pharmaceutical in a non-empty container (stock, dispensing and unit-dose; syringe; IV bag; or "other container") may meet the definition of "potentially creditable hazardous waste pharmaceutical," if it has a reasonable expectation of receiving manufacturer credit and is:

- In its original manufacturer packaging;
- undispensed, and
- unexpired or less than one year past expiration.

A non-empty container could include either a full, unopened container or a partial container. If the hazardous waste pharmaceutical does meet the definition of "potentially creditable," § 266.507 does not preclude a non-empty container with a potentially creditable hazardous waste pharmaceutical from being sent to a reverse distributor. After a reverse distributor evaluates the potentially creditable hazardous waste pharmaceuticals for manufacturer credit, the reverse distributor must manage them as evaluated hazardous waste pharmaceuticals.

L. Radio Frequency Identification (§§ 266.508 and 266.510)

We are revising §§ 266.508(a)(1)(iii)(C) and 266.510(c)(5) to insert the noun "tag" following the phrase "radio frequency identification." Section 266.508 is standards for shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility or evaluated hazardous waste pharmaceuticals from a reverse distributor. Section 266.510(c) is standards for reverse distributors managing evaluated hazardous waste pharmaceuticals. In both cases, we used the modifying phrase "radio frequency identification" without including the noun to which it applied, and so we are now including the noun "tag."

M. PHARMS Code (§ 266.508)

When part 266, subpart P, was promulgated, the EPA required healthcare facilities to use the word "PHARMS" on Item 13 of the manifest for non-creditable hazardous waste pharmaceuticals being shipped to a designated facility (*e.g.,* TSDF). As explained in the preamble to the final rule (see 84 FR 5909), we used six characters because the e-Manifest system can accommodate six characters, and because PHARMS communicates the nature of the waste. However, since the final rule was published, the EPA became aware of two issues related to using six characters. First, although the e-Manifest system can accommodate six characters and PHARMS can be selected from a prepopulated menu within the e-Manifest system, most generators are currently initiating shipments using paper manifests, not fully electronic manifests. The paper manifest was designed to accommodate four-character hazardous waste codes which has made it difficult to fit the entire PHARMS code in the box without exceeding the allotted space. Second, some States and industry stakeholders have told us that their databases are not designed to accommodate six characters, which means that a redesign of their database is required for them to exchange data with the EPA's e-Manifest system.

To assist implementation, the EPA issued a memorandum on this issue allowing the use the four-character code PHRM on both paper manifests and electronic manifests when shipping non-creditable hazardous waste pharmaceuticals under subpart P.[8] This four-character code achieves the same result as the six-character code; therefore, either code satisfies the requirement at § 266.508(a)(2)(ii). The EPA is now amending the regulations to be consistent with the guidance included in the memorandum.

Both PHRM/PHARMS codes have been and will continue to be available for use in the e-Manifest system, with identical "Hazardous Waste Pharmaceuticals" descriptions.

This change is also consistent with guidance the EPA included in the Hazardous Waste Pharmaceuticals final rule Frequent Questions web page.[9]

N. Reverse Distributor Standards (§ 266.510)

1. Unauthorized Waste Reports

When a reverse distributor receives waste from off site that it is not authorized to receive (*e.g.,* non-pharmaceutical hazardous waste or regulated medical waste), it must submit an unauthorized waste report to the EPA Regional Administrator (or authorized State) within 45 calendar days. Section 266.510(a)(9)(i)(A) through (F) includes the list of elements that must be included in an unauthorized waste report. Paragraph (a)(9)(i)(C) of § 266.510 specifies that the EPA identification number, name, and address of the healthcare facility that shipped the unauthorized waste must be included in the report, if available. However, healthcare facilities are not the only entities that may ship to a reverse distributor. Other reverse distributors may also ship to a reverse distributor. Further, because this section addresses situations of non-compliance, it is possible that a reverse distributor could wrongly receive a shipment from another entity that includes unauthorized waste. Therefore, we are revising § 266.510(a)(9)(i)(C) by adding the parenthetical "(or other entity)" after healthcare facility, to reflect that possibility.

2. Hazardous Waste Numbers

Section 266.510(c)(5) applies to reverse distributors, and states "[P]rior to shipping evaluated hazardous waste pharmaceuticals off site, all containers must be marked with the applicable [EPA] hazardous waste numbers (*i.e.,* hazardous waste codes)." Earlier in this preamble, we explained the addition of "EPA" prior to "hazardous waste numbers," wherever it appears in subpart P.

Section 266.508(a)(1)(iii)(C) allows for an exception to having to mark containers with the applicable hazardous waste numbers. Specifically, it allows that lab packs that will be incinerated in compliance with § 268.42(c) are not required to be marked with EPA hazardous waste numbers, except D004, D005, D006, D007, D008, D010, and D011, where applicable.

In § 266.510(c)(5), we are adding a cross-reference to the lab pack marking exception in § 266.508(a)(1)(iii)(C). The exception for marking lab packs with most EPA hazardous waste numbers applies regardless of this addition; nevertheless, we are adding the cross-reference for clarity and to aid the reader.

[8] Johnson to Land, Chemicals and Redevelopment Division Directors, December 19, 2019, RCRA Online #14919.

[9] *https://www.epa.gov/hwgenerators/frequent-questions-about-management-standards-hazardous-waste-pharmaceuticals-and#e1.*

3. Reporting by a Reverse Distributor for Evaluated Hazardous Waste Pharmaceuticals

Section 266.510(c)(9)(ii) includes instructions for how a reverse distributor must file an exception report when it is missing a copy of the manifest for evaluated hazardous waste pharmaceuticals that it shipped to a designated facility.

Section 266.510(c)(9)(ii)(B) addresses the situation when a shipment is rejected by the designated facility and is shipped to an alternate facility. Paragraph (c)(9)(ii)(B)(*2*)(*i*) of § 266.510 states that a legible copy of the manifest for which the generator does not have confirmation of delivery must be included in the exception report. When the EPA adapted the generator exception reporting regulations for reverse distributors, we neglected to revise ''generator'' to ''reverse distributor,'' as we had intended. We are now revising the regulations to replace the word ''generator'' with ''reverse distributor.''

O. Hazardous and Solid Waste Amendments of 1984 (§ 271.1)

Table 1 in § 271.1 includes a list of RCRA Subtitle C regulations that have been added pursuant to HSWA. As the EPA explained in the preamble to the Hazardous Waste Pharmaceuticals final rule, the sewer prohibition was added to part 266, subpart P, pursuant to HSWA; [10] however, the EPA neglected to update Table 1 in § 271.1. This omission has no bearing on whether the sewer prohibition is considered a HSWA provision since the statute and preamble to the Pharmaceuticals final rule make clear that it is. For the sake of completeness and convenience to the reader, however, the EPA is making a technical correction to update Table 1 in § 271.1, with the addition of a row to add the Hazardous Waste Pharmaceuticals final rule and which will appear in chronological order.

P. Correction to a Preamble Statement in the Hazardous Waste Pharmaceuticals Final Rule

When discussing the management of residues in pharmaceutical containers in the preamble to the Hazardous Waste Pharmaceuticals final rule, we cited an EPA memorandum from November 2011, with the subject ''Containers that Once Held P-Listed Pharmaceuticals.'' [11] On page 5903 of the preamble to the final rule, we stated:

This guidance was intended as a short-term solution that worked within the confines of the existing RCRA hazardous waste regulations . . . Today's new ''empty container'' regulations in § 266.507 will replace the November 2011 guidance as it pertained to residues of hazardous waste pharmaceuticals in containers, although the memo will remain in effect for non-pharmaceutical hazardous wastes.

In this rule, we are clarifying that while there are portions of the November 2011 memorandum that were made moot by the final rule, there are other portions of the November 2011 memorandum that are still valid with respect to acute (P-listed) hazardous waste pharmaceuticals.

The November 2011 memorandum provided guidance about containers that once held P-listed pharmaceuticals outlining three regulatory approaches for generators:

(1) Count only the weight of the hazardous waste residues toward their monthly generator category determination;

(2) Demonstrate an equivalent removal method to triple rinsing to render containers RCRA empty; and

(3) In the case of warfarin, show that the concentration in the residue is below the P-listed concentration.

1. Portion of the November 11, 2011, Memorandum That Is Still Valid With Respect to Acute Hazardous Waste Pharmaceuticals

The first approach outlined in the memorandum states that it is only necessary to count the weight of the actual hazardous waste, not the weight of the container holding the hazardous waste. This approach is not relevant to reverse distributors, because all reverse distributors must operate under subpart P, regardless of the amount of hazardous waste pharmaceuticals that are on site. On the other hand, this is still an allowable approach for a healthcare facility managing P-listed pharmaceutical waste, although it is probably only useful to a limited universe of healthcare facilities. The reason its utility is limited is that all healthcare facilities operating under subpart P are regulated the same as each other with respect to their hazardous waste pharmaceuticals. Put another way, there are no generator categories under subpart P. As a result, if a healthcare facility is operating under subpart P, it is not necessary to count the weight of the hazardous waste pharmaceuticals that it generates each month. If, however, a healthcare facility is not operating under subpart P, then this approach might be useful to determine whether it is required to operate under subpart P or prove that it is a VSQG and therefore not required to operate under subpart P (likewise, other generators might find this approach useful to determine whether they are required to operate as SQGs or LQGs under part 262 or prove that they are VSGQs). A healthcare facility must operate under subpart P for its hazardous waste pharmaceuticals if it generates more than VSQG amounts of any hazardous waste (*i.e.,* more than 1 kilogram of acute hazardous waste or more than 100 kilogram of non-acute hazardous waste per calendar month). Including the weight of containers may impact whether a healthcare facility exceeds the 1 kilogram acute hazardous waste monthly threshold, and, in turn, the requirement to operate under subpart P.

Note that if a container is considered RCRA empty, the residues are not regulated as hazardous waste; therefore, it is not necessary to count the weight of the P-listed pharmaceutical residues or the weight of the container. On the other hand, if a container is not RCRA empty, the residues are regulated as RCRA hazardous waste. For non-empty containers, it is only necessary to count the weight of the P-listed pharmaceutical residues, not the weight of the container. If a healthcare facility has containers of P-listed pharmaceutical waste that are not RCRA empty and is determining whether it is subject to subpart P, it may be useful for a healthcare facility to count only the weight of the P-listed acute hazardous waste and not count the weight of the container.

2. Portions of the November 11, 2011, Memorandum That Have Been Superseded With Respect to Acute Hazardous Waste Pharmaceuticals

In contrast, the second and third approaches outlined in the November 2011 memorandum have been superseded by the hazardous waste pharmaceuticals final rule. The reason each approach has been made moot by the rule is explained separately below.

The second approach in the November 2011 memorandum for managing containers that held P-listed pharmaceuticals could have been used to demonstrate an equivalent removal method to render containers RCRA empty. This was an existing regulatory mechanism that was offered as an alternative to triple rinsing containers to render them RCRA empty. Section 261.7(b)(3)(i) specifies that a container that held an acute hazardous waste is

[10] 84 FR 5816, February 22, 2019. See pages 5892 and 5936.

[11] Rudzinski to RCRA Division Directors, November 11, 2011, RCRA Online #14827.

empty if the container (or inner liner) has been triple rinsed using an appropriate solvent. Section 261.7(b)(3)(ii) offers an alternative whereby a container that held an acute hazardous waste is empty if the container (or inner liner) has been ''cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generators, to achieve equivalent removal.'' Section 266.507 of subpart P makes § 261.7(b)(3) moot for hazardous waste pharmaceuticals. That is because under § 266.507, triple rinsing (or an equivalent method) is either not required, or not allowed, depending on the type of container:

(1) *Stock, dispensing and unit-dose containers:* triple rinsing is not required to meet the definition of ''RCRA empty'' for a container that held an acute hazardous waste pharmaceutical. For these types of containers, a container is considered RCRA empty if the pharmaceuticals have been removed from the container using practices commonly employed to remove materials of that type from the container. For these types of containers, the definition of ''empty'' is the same for all pharmaceuticals, including P-listed pharmaceuticals.

(2) *Syringes:* triple rinsing is not required to meet the definition of ''RCRA empty'' for a syringe that held an acute hazardous waste pharmaceutical. For syringes, the syringe is considered RCRA empty if the plunger of the syringe has been fully depressed. For syringes, the definition of ''empty'' is the same for all pharmaceuticals, including P-listed pharmaceuticals.

(3) *IV bags:* triple rinsing of IV bags with acute hazardous waste pharmaceuticals is not allowed. If the P-listed pharmaceutical in the IV bag has not been completely administered, a healthcare facility operating under subpart P must manage it as a non-creditable hazardous waste pharmaceutical.

(4) *Other containers:* triple rinsing ''other containers'' of acute hazardous waste pharmaceuticals is not allowed and there is no method to make such containers RCRA empty. A healthcare facility operating under subpart P must manage a P-listed drug in an ''other container'' as a non-creditable hazardous waste pharmaceutical.

The third approach in the November 2011 memorandum for managing containers that held P-listed pharmaceuticals pertains only to warfarin, which is one of the two concentration-based P-listings. When warfarin is present at concentrations greater than 0.3%, it is an acute hazardous waste with the waste code P001. When warfarin is present at concentrations at or below 0.3%, it is a non-acute hazardous waste with the waste code U248. The memorandum offered the option of showing that the concentration in the residue in the container is below the P-listed concentration. Our thinking was that perhaps the residues would consist primarily of a non-warfarin coating on the outside of the pills, rather than warfarin itself, and thus the residue might have a concentration of warfarin that would be U-listed. Whether the warfarin is P-listed or U-listed was relevant because it drove the method that must be used to render the container RCRA empty. That is, under § 261.7, if the residues remaining in the container were U248 instead of P001, then the container would not need to be triple rinsed to render it RCRA empty. Under subpart P, however, triple rinsing is no longer required to render a warfarin container RCRA empty, so it is now unnecessary to demonstrate that the residues are U-listed rather than P-listed.

VII. Corrections to 40 CFR Part 261 Identification and Listing of Hazardous Waste

This section addresses technical corrections to the changes made in response to a partial vacatur of the 2015 Definition of Solid Waste (DSW) final rule. It also includes technical corrections of typographical errors and missing or incorrect citations found in 40 CFR part 261.

A. Corrections Related to the 2018 Vacatur of the Definition of Solid Waste Rule

On July 7, 2017, and March 6, 2018,[12] the United States Court of Appeals for the District of Columbia Circuit issued opinions on the 2015 DSW final rule [13] that, among other things,[14] (1) vacated the 2015 verified recycler exclusion for hazardous waste that is recycled off site (except for certain provisions); (2) reinstated the 2008 transfer-based exclusion to replace the now-vacated 2015 verified recycler exclusion; and (3) upheld the 2015 containment and emergency preparedness provisions and the eligibility of spent petroleum catalysts and applied these to the reinstated transfer-based exclusion. As a result, the EPA issued the 2018 DSW final rule that implemented the court's decision on May 23, 2018. See 83 FR 24664.

However, several references to the vacated provisions remained in 40 CFR part 261 subpart M—Emergency Preparedness and Response for Management of Excluded Hazardous Secondary Materials. In this rule, the EPA is correcting that error by removing all references to § 260.31(d) (vacated provision). Provisions affected are §§ 261.400(a), (b); 261.410(e), (f)(1) and (2); 261.411 introductory text, (b), (c), and (d)(3); and 261.420 introductory text, (a)(1), and (b)(2).

In addition, the 2018 vacatur response reinstated the export provisions for the transfer-based exclusion, found at § 261.4(a)(25). However, those reinstated provisions did not reflect the revisions the EPA had made to RCRA export requirements in the interim. In 2016, the EPA finalized changes to existing regulations regarding the export and import of hazardous wastes and other RCRA regulated materials from and into the United States (81 FR 85696, November 28, 2016). The final rule established: (1) Improved export and import shipment tracking; (2) one consolidated and streamlined set of requirements applying to all imports and exports; (3) mandatory electronic reporting to the EPA; and (4) a link between the consent to export and the electronic export information submitted to U.S. Customs and Border Protection.

However, these changes did not apply to hazardous secondary material recycled under the exclusion at § 261.4(a)(24) and (25), because the EPA had removed the export provisions in the 2015 DSW final rule. When the export provisions were reinstated in 2018 in response to the court vacatur, they did not reflect the improvements made to all the other RCRA export-import provisions. This rule updates the hazardous secondary material export requirements in § 261.4(a)(25) to be consistent with other RCRA export requirements.

B. Correction of Typographical Errors and Missing or Incorrect References

The EPA is also correcting a number of typographical errors and missing or incorrect references found in 40 CFR part 261 to:

- Add containment buildings (subpart DD of 40 CFR parts 264 and 265) to the list of management methods applicable to recyclable materials in § 261.6(c)(1).

[12] *American Petroleum Institute* v. *Environmental Protection Agency,* 862 F.3d 50 (D.C. Cir. 2017), decision modified on rehearing, 883 F.3d 918 (D.C. Cir. 2018).

[13] See 80 FR 1694, January 13, 2015.

[14] The court also vacated factor four of the 2015 definition of legitimate recycling found at 40 CFR 260.43 and reinstated the 2008 version of factor four to replace the now-vacated 2015 version of factor four.

- Change cited regulations from § 265.5113(d) (incorrect) to § 265.113(d) (correct). See § 261.142(a)(3) and (4).
- Change cited regulations from § 265.143(i) (incorrect) to § 261.143(i) (correct) See § 261.143(a)(7).
- Change cited regulations from § 264.151(g)(2) (incorrect) to § 261.151(g)(2) (correct). See § 261.147(g)(2)(i)(B).
- Change cited regulations from § 261.151(h)(2) (incorrect) to § 261.151(g)(2) (correct). See § 261.147(g)(2)(ii)(B).
- Correct numbering at § 261.151(g)(2). Remove the number for current paragraph 10 of the required agreement language under ''RECITALS.'' Correct the reference to paragraph 10 in paragraph 8 to read paragraph 9. Renumber the subsequent paragraphs of the required agreement language under ''RECITALS.''
- Correct truncated text at § 261.151(l)(2). Consistent with the corresponding provision in § 264.151(m)(2), the final sentence is corrected to read: ''State requirements may differ on the proper content of this acknowledgement.''
- Change cited regulation from § 262.410(f) (incorrect) to § 261.410(f) (correct). See § 261.420(b)(3).
- Revise ''subpart X of this part'' (incorrect) to ''subpart X of part 264'' (correct). See § 261.1033(n)(1)(i).
- Change cited regulations from § 261.1082(c)(1) (incorrect) to § 261.1082(c) (correct). See § 261.1083(a)(1), (a)(1)(i); and § 261.1084(j)(2)(i).
- Change cited regulations from § 261.1085(b)(1)(i) (incorrect) to § 261.1084(b)(1)(i) (correct). See § 261.1083(c)(4).
- Change cited regulations from § 261.1082(c)(2) (incorrect) to § 264.1082(c)(2) (correct). See § 261.1084(j)(2)(ii).
- Change cited regulations from § 261.1082(c)(4) (incorrect) to § 264.1082(c)(4) (correct). See § 261.1084(j)(2)(iii).
- Change cited regulations from § 261.1080(b)(7) or (d) (incorrect) to § 261.1080(a) (correct). See § 261.1089(a).
- Change cited regulations from § 261.1082(c)(1) or (c)(2)(i) through (vi) (incorrect) to § 261.1082(c) (correct). See § 261.1089(f).
- Remove incorrect reference to § 261.1085(g) (does not exist). See § 261.1089(g).

VIII. State Authorization

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, the EPA may authorize a qualified State to administer its own hazardous waste program within the State in lieu of the Federal program. Following authorization, the EPA retains enforcement authority under sections 3008, 3013, and 7003 of RCRA, although authorized States have primary enforcement responsibility. The standards and requirements for State authorization are found at 40 CFR part 271.

Prior to enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final RCRA authorization administered its hazardous waste program entirely in lieu of the EPA administering the Federal program in that State. The Federal requirements no longer applied in the authorized State, and the EPA could not issue permits for any facilities in that State, since only the State was authorized to issue RCRA permits. When new, more stringent Federal requirements were promulgated, the State was obligated to enact equivalent authorities within specified time frames. However, the new Federal requirements did not take effect in an authorized State until the State adopted the Federal requirements as State law.

In contrast, under RCRA section 3006(g) (42 U.S.C. 6926(g)), which was added by HSWA, new requirements and prohibitions imposed under HSWA authority take effect in authorized States at the same time that they take effect in unauthorized States. The EPA is directed by the statute to implement these requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA related provisions as State law to retain final authorization, the EPA implements the HSWA provisions in authorized States until the States do so.

Authorized States are required to modify their program only when the EPA enacts Federal requirements that are more stringent or broader in scope than the existing Federal requirements. RCRA section 3009 allows the States to impose standards more stringent than those in the Federal program (see also 40 CFR 271.1). Therefore, authorized States may, but are not required to, adopt Federal regulations, both HSWA and non-HSWA, that are considered less stringent than or equally as stringent as the previous Federal regulations.

B. Effect on State Authorization

This direct final rule finalizes technical corrections to a number of the regulations in 40 CFR parts 260, 261, 262, 264, 265, 266, 270, 271, and 441 that are being promulgated in part under the authority of HSWA, and in part under non-HSWA authority. Thus, the technical corrections and clarifications finalized in this direct final rule under non-HSWA authority would be applicable on the effective date only in those States that do not have final authorization of their base RCRA programs. The technical corrections to regulations in § 262.16(b)(1) are promulgated under the authority of HSWA and would be effective on the effective date of this direct final rule in all States unless the State is not authorized for the underlying provisions. Moreover, authorized States are required to modify their programs only when the EPA promulgates Federal regulations that are more stringent or broader in scope than the authorized State regulations. For those changes that are less stringent or reduce the scope of the Federal program, States are not required to modify their program. This is a result of section 3009 of RCRA, which allows States to impose more stringent regulations than the Federal program. This direct final rule is considered to be neither more nor less stringent than the current standards. Therefore, authorized States would not be required to modify their programs to adopt the technical corrections promulgated in this direct final rule, although we would strongly urge the States to adopt these technical corrections to avoid any confusion or misunderstanding by the regulated community and the public.

Although this rule makes a correction to Table 1 in § 271.1 which lists the provisions that have been promulgated under HSWA authority, the correction to the table is not itself being promulgated under HSWA.

IX. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14094: Modernizing Regulatory Review

This action is not a significant regulatory action as defined in Executive Order 12866, as amended by Executive Order 14094, and was therefore not subject to a requirement for Executive Order 12866 review.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the

PRA because it does not contain any information collection activities. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control numbers 2050–0213, 2050–0202, and 2050–0212.

C. 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. In making this determination, EPA concludes that the impact of concern for this rule is any significant adverse economic impact on small entities and that the agency is certifying that this rule will not have a significant economic impact on a substantial number of small entities because the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. This action simply corrects typographical errors, incorrect citations, and omissions; provides clarifications; and makes conforming changes where they have not been made previously. We have therefore concluded that this action will have no net regulatory burden for all directly regulated small entities.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate 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.

E. 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.

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

This action does not have tribal implications as specified in Executive Order 13175. Because the rule does not make any substantive change, it will not impose substantial direct costs on Tribal governments. Thus, Executive Order 13175 does not apply to this action.

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

EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definition of ''covered regulatory action'' in section 2–202 of the Executive order.

Therefore, this action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk. Since this action does not concern human health, EPA's Policy on Children's Health also does not apply.

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

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

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

Executive Order 12898 (59 FR 7629, February 16, 1994) directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations (people of color) and low-income populations.

The EPA believes that these technical corrections do not directly impact human health or environmental conditions and therefore cannot be evaluated with respect to potentially disproportionate and adverse effects on people of color, low-income populations and/or indigenous peoples because this final rule does not create any new regulatory requirements, but rather clarifies existing requirements and makes conforming changes.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

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

List of Subjects

40 CFR Part 260

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Hazardous waste, Intergovernmental relations, Licensing and registration, Reporting and recordkeeping requirements.

40 CFR Part 261

Environmental protection, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 262

Environmental protection, Exports, Hazardous materials transportation, Hazardous waste, Imports, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

40 CFR Part 264

Environmental protection, Air pollution control, Hazardous waste, Insurance, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Surety bonds.

40 CFR Part 265

Environmental protection, Air pollution control, Hazardous waste, Insurance, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Surety bonds, Water supply.

40 CFR Part 266

Environmental protection, Energy, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 270

Environmental Protection, Administrative practice and procedure, Confidential business information, Hazardous materials transportation, Hazardous waste, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 271

Environmental Protection, Administrative practice and procedure, Confidential business information, Hazardous materials transportation, Hazardous waste, Indians—lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 441

Environmental Protection, Health facilities, Mercury, Waste treatment and disposal, Water pollution control.

Michael S. Regan,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

■ 1. The authority for part 260 continues to read as follows:

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

§ 260.10 [Amended]

■ 2. Section 260.10 is amended in the definition of ''Final closure'' by removing ''§ 262.34'' and adding ''§§ 262.16 and 262.17'' in its place.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

■ 3. The authority for part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y) and 6938.

■ 4. Section 261.1 is amended by revising paragraph (a)(1) to read as follows:

§ 261.1 Purpose and scope.

(a) * * *

(1) Subpart A defines the terms ''solid waste'' and ''hazardous waste'', identifies those wastes which are excluded from regulation under parts 262 through 266, 268, and 270 of this subchapter and establishes special management requirements for hazardous waste which is recycled.

* * * * *

■ 5. Section 261.4 is amended by revising paragraphs (a)(25)(i)(I), (a)(25)(vi) and (vii), (a)(25)(xi)(D), and (e)(1) introductory text to read as follows:

§ 261.4 Exclusions.

(a) * * *

(25) * * *

(i) * * *

(I) The name of any countries of transit through which the hazardous secondary material will be sent and a description of the approximate length of time it will remain in such countries and the nature of its handling while there (for purposes of this section, the terms ''EPA Acknowledgment of Consent'', ''country of import'' and ''country of transit'' are used as defined in 40 CFR 262.81 with the exception that the terms in this section refer to hazardous secondary materials, rather than hazardous waste):

* * * * *

(vi) The export of hazardous secondary material under this paragraph (a)(25) is prohibited unless the hazardous secondary material generator receives from EPA an EPA Acknowledgment of Consent documenting the consent of the country of import to the receipt of the hazardous secondary material. Where the country of import objects to receipt of the hazardous secondary material or withdraws a prior consent, EPA will notify the hazardous secondary material generator in writing. EPA will also notify the hazardous secondary material generator of any responses from countries of transit.

(vii) Prior to each shipment, the hazardous secondary material generator or a U.S. authorized agent must:

(A) Submit Electronic Export Information (EEI) for each shipment to the Automated Export System (AES) or its successor system, under the International Trade Data System (ITDS) platform, in accordance with 15 CFR 30.4(b).

(B) Include the following items in the EEI, along with the other information required under 15 CFR 30.6:

(*1*) EPA license code;

(*2*) Commodity classification code per 15 CFR 30.6(a)(12);

(*3*) EPA consent number;

(*4*) Country of ultimate destination per 15 CFR 30.6(a)(5);

(*5*) Date of export per 15 CFR 30.6(a)(2);

(*6*) Quantity of waste in shipment and units for reported quantity, if required reporting units established by value for the reported commodity classification number are in units of weight or volume per 15 CFR 30.6(a)(15); or

(*7*) EPA net quantity reported in units of kilograms, if required reporting units established by value for the reported commodity classification number are not in units of weight or volume.

* * * * *

(xi) * * *

(D) By reclaimer and intermediate facility, for each hazardous secondary material exported, a description of the hazardous secondary material and the EPA hazardous waste number that would apply if the hazardous secondary material was managed as hazardous waste, the DOT hazard class, the name and U.S. EPA ID number (where applicable) for each transporter used, the consent number(s) under which the hazardous secondary material was shipped and for each consent number, the total amount of hazardous secondary material shipped and the number of shipments exported during the calendar year covered by the report;

* * * * *

(e) * * *

(1) Except as provided in paragraphs (e)(2) and (4) of this section, persons who generate or collect samples for the purpose of conducting treatability studies as defined in 40 CFR 260.10, are not subject to any requirement of this part and 40 CFR parts 262 and 263 or to the notification requirements of section 3010 of RCRA, nor are such samples included in the quantity determinations of 40 CFR 262.13 and the accumulation limits in 40 CFR 262.16(b)(1) when:

* * * * *

■ 6. Section 261.6 is amended by revising paragraph (c)(1) to read as follows:

§ 261.6 Requirements for recyclable materials.

* * * * *

(c)(1) Owners and operators of facilities that store recyclable materials before they are recycled are regulated under all applicable provisions of subparts A though L and AA through DD of 40 CFR parts 264 and 265, and under 40 CFR parts 124, 266, 267, 268, and 270 and the notification requirements under section 3010 of RCRA, except as provided in paragraph (a) of this section. (The recycling process itself is exempt from regulation except as provided in paragraph (d) of this section.)

* * * * *

§ 261.11 [Amended]

■ 7. Section 261.11 is amended by removing paragraph (c).

■ 8. Section 261.30 is amended by revising paragraph (d) to read as follows:

§ 261.30 General.

* * * * *

(d) The following hazardous wastes listed in § 261.31 are subject to the generator category limits for acutely hazardous wastes established in table 1 of § 262.13 of this subchapter: EPA Hazardous Wastes Nos. F020, F021, F022, F023, F026 and F027.

■ 9. Section 261.142 is amended by revising paragraphs (a)(2) through (4) to read as follows:

§ 261.142 Cost estimate.

(a) * * *

(2) The cost estimate must be based on the costs to the owner or operator of hiring a third party to conduct these activities. A third party is a party who is neither a parent nor a subsidiary of the owner or operator. (See definition of ''parent corporation'' in § 265.141(d) of this subchapter.) The owner or operator may use costs for on-site disposal in accordance with applicable requirements if he can demonstrate that on-site disposal capacity will exist at all times over the life of the facility.

(3) The cost estimate may not incorporate any salvage value that may be realized with the sale of hazardous secondary materials, or hazardous or non-hazardous wastes if applicable under § 265.113(d) of this subchapter, facility structures or equipment, land, or other assets associated with the facility.

(4) The owner or operator may not incorporate a zero cost for hazardous secondary materials, or hazardous or non-hazardous wastes if applicable under § 265.113(d) of this subchapter that might have economic value.

* * * * *

■ 10. Section 261.143 is amended by revising paragraph (a)(7) to read as follows:

§ 261.143 Financial assurance condition.

* * * * *

(a) * * *

(7) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraph (a)(5) or (6) of this section, the Regional Administrator will instruct the trustee to release to the owner or operator such funds as the Regional Administrator specifies in writing. If the owner or operator begins final closure under subpart G of 40 CFR part 264 or 265, an owner or operator may request reimbursements for partial or final closure expenditures by submitting itemized bills to the Regional Administrator. The owner or operator may request reimbursements for partial closure only if sufficient funds are remaining in the trust fund to cover the maximum costs of closing the facility over its remaining operating life. No later than 60 days after receiving bills for partial or final closure activities, the Regional Administrator will instruct the trustee to make reimbursements in those amounts as the Regional Administrator specifies in writing, if the Regional Administrator determines that the partial or final closure expenditures are in accordance with the approved closure plan, or otherwise justified. If the Regional Administrator has reason to believe that the maximum cost of closure over the remaining life of the facility will be significantly greater than the value of the trust fund, he may withhold reimbursements of such amounts as he deems prudent until he determines, in accordance with paragraph (i) of this section that the owner or operator is no longer required to maintain financial assurance for final closure of the facility. If the Regional Administrator does not instruct the trustee to make such reimbursements, he will provide to the owner or operator a detailed written statement of reasons.

* * * * *

■ 11. Section 261.147 is amended by revising paragraphs (g)(2)(i)(B) and (g)(2)(ii)(B) to read as follows:

§ 261.147 Liability requirements.

* * * * *

(g) * * *

(2)(i) * * *

(B) Each State in which a facility covered by the guarantee is located have submitted a written statement to EPA that a guarantee executed as described in this section and § 261.151(g)(2) is a legally valid and enforceable obligation in that State.

(ii) * * *

(B) The Attorney General or Insurance Commissioner of each State in which a facility covered by the guarantee is located and the State in which the guarantor corporation has its principal place of business, has submitted a written statement to EPA that a guarantee executed as described in this section and § 261.151(g)(2) is a legally valid and enforceable obligation in that State.

* * * * *

■ 12. Section 261.151 is amended by revising paragraphs (g)(2) and (l)(2) to read as follows:

§ 261.151 Wording of the instruments.

* * * * *

(g) * * *

(2) A guarantee, as specified in § 261.147(g), must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Guarantee for Liability Coverage

Guarantee made this [date] by [name of guaranteeing entity], a business corporation organized under the laws of [if incorporated within the United States insert ''the State of _____-'' and insert name of State; if incorporated outside the United States insert the name of the country in which incorporated, the principal place of business within the United States, and the name and address of the registered agent in the State of the principal place of business], herein referred to as guarantor. This guarantee is made on behalf of [owner or operator] of [business address], which is one of the following: ''our subsidiary;'' ''a subsidiary of [name and address of common parent corporation], of which guarantor is a subsidiary;'' or ''an entity with which guarantor has a substantial business relationship, as defined in 40 CFR [either 264.141(h) or 265.141(h)]'', to any and all third parties who have sustained or may sustain bodily injury or property damage caused by [sudden and/or nonsudden] accidental occurrences arising from operation of the facility(ies) covered by this guarantee.

Recitals

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in *40 CFR 261.147(g).*

2. [Owner or operator] owns or operates the following facility(ies) covered by this guarantee: [List for each facility: EPA identification number (if any issued), name, and address; and if guarantor is incorporated outside the United States list the name and address of the guarantor's registered agent in each State.] This corporate guarantee satisfies RCRA third-party liability requirements for [insert ''sudden'' or ''nonsudden'' or ''both sudden and nonsudden''] accidental occurrences in above-named owner or operator facilities for coverage in the amount of [insert dollar amount] for each occurrence and [insert dollar amount] annual aggregate.

3. For value received from [owner or operator], guarantor guarantees to any and all third parties who have sustained or may sustain bodily injury or property damage caused by [sudden and/or nonsudden] accidental occurrences arising from operations of the facility(ies) covered by this guarantee that in the event that [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [sudden and/or nonsudden] accidental occurrences, arising from the operation of the above-named facilities, or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor will satisfy such judgment(s), award(s) or settlement agreement(s) up to the limits of coverage identified above.

4. Such obligation does not apply to any of the following:

(a) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that [insert owner or operator] would be obligated to pay in the absence of the contract or agreement.

(b) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or any similar law.

(c) Bodily injury to:

(1) An employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator]; or

(2) The spouse, child, parent, brother, or sister of that employee as a consequence of, or arising from, and in the course of employment by [insert owner or operator]. This exclusion applies:

(A) Whether [insert owner or operator] may be liable as an employer or in any other capacity; and

(B) To any obligation to share damages with or repay another person who must pay damages because of the injury to persons identified in paragraphs (1) and (2).

(d) Bodily injury or property damage arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle or watercraft.

(e) Property damage to:

(1) Any property owned, rented, or occupied by [insert owner or operator];

(2) Premises that are sold, given away or abandoned by [insert owner or operator] if the property damage arises out of any part of those premises;

(3) Property loaned to [insert owner or operator];

(4) Personal property in the care, custody or control of [insert owner or operator];

(5) That particular part of real property on which [insert owner or operator] or any contractors or subcontractors working directly or indirectly on behalf of [insert owner or operator] are performing operations, if the property damage arises out of these operations.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the EPA Regional Administrator[s] for the Region[s] in which the facility[ies] is[are] located and to [owner or operator] that he intends to provide alternate liability coverage as specified in *40 CFR 261.147*, as applicable, in the name of [owner or operator]. Within 120 days after the end of such fiscal year, the guarantor shall establish such liability coverage unless [owner or operator] has done so.

6. The guarantor agrees to notify the EPA Regional Administrator by certified mail of a voluntary or involuntary proceeding under title 11 (Bankruptcy), U.S. Code, naming guarantor as debtor, within 10 days after commencement of the proceeding. Guarantor agrees that within 30 days after being notified by an EPA Regional Administrator of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor, he shall establish alternate liability coverage as specified in *40 CFR 261.147* in the name of [owner or operator], unless [owner or operator] has done so.

7. Guarantor reserves the right to modify this agreement to take into account amendment or modification of the liability requirements set by *40 CFR 261.147*, provided that such modification shall become effective only if a Regional Administrator does not disapprove the modification within 30 days of receipt of notification of the modification.

8. Guarantor agrees to remain bound under this guarantee for so long as [owner or operator] must comply with the applicable requirements of *40 CFR 261.147* for the above-listed facility(ies), except as provided in paragraph 9 of this agreement.

9. [Insert the following language if the guarantor is (a) a direct or higher-tier corporate parent, or (b) a firm whose parent corporation is also the parent corporation of the owner or operator]:

Guarantor may terminate this guarantee by sending notice by certified mail to the EPA Regional Administrator(s) for the Region(s) in which the facility(ies) is(are) located and to [owner or operator], provided that this guarantee may not be terminated unless and until [the owner or operator] obtains, and the EPA Regional Administrator(s) approve(s), alternate liability coverage complying with *40 CFR 261.147*.

[Insert the following language if the guarantor is a firm qualifying as a guarantor due to its ''substantial business relationship'' with the owner or operator]:

Guarantor may terminate this guarantee 120 days following receipt of notification, through certified mail, by the EPA Regional Administrator(s) for the Region(s) in which the facility(ies) is(are) located and by [the owner or operator].

10. Guarantor hereby expressly waives notice of acceptance of this guarantee by any party.

11. Guarantor agrees that this guarantee is in addition to and does not affect any other responsibility or liability of the guarantor with respect to the covered facilities.

12. The Guarantor shall satisfy a third-party liability claim only on receipt of one of the following documents:

(a) Certification from the Principal and the third-party claimant(s) that the liability claim should be paid. The certification must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Certification of Valid Claim

The undersigned, as parties [insert Principal] and [insert name and address of third-party claimant(s)], hereby certify that the claim of bodily injury and/or property damage caused by a [sudden or nonsudden] accidental occurrence arising from operating [Principal's] facility should be paid in the amount of $.

[Signatures]
Principal
(Notary) Date
[Signatures]
Claimant(s)
(Notary) Date

(b) A valid final court order establishing a judgment against the Principal for bodily injury or property damage caused by sudden or nonsudden accidental occurrences arising from the operation of the Principal's facility or group of facilities.

13. In the event of combination of this guarantee with another mechanism to meet liability requirements, this guarantee will be considered [insert ''primary'' or ''excess''] coverage.

I hereby certify that the wording of the guarantee is identical to the wording specified in *40 CFR 261.151(g)(2)* as such regulations were constituted on the date shown immediately below.

Effective date:
[Name of guarantor]
[Authorized signature for guarantor]
[Name of person signing]
[Title of person signing]
Signature of witness or notary:

* * * * *

(l) * * *

(2) The following is an example of the certification of acknowledgement which must accompany the trust agreement for a trust fund as specified in § 261.147(j). State requirements may differ on the proper content of this acknowledgement.

State of
County of
On this [date], before me personally came [owner or operator] to me known, who, being by me duly sworn, did depose and say that she/he resides at [address], that she/he is [title] of [corporation], the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that she/he signed her/his name thereto by like order.

[Signature of Notary Public]

* * * * *

■ 13. Section 261.400 is amended by revising paragraphs (a) and (b) to read as follows:

§ 261.4009 Applicability.

* * * * *

(a) A generator of hazardous secondary material, or an intermediate or reclamation facility, that accumulates 6000 kg or less of hazardous secondary material at any time must comply with §§ 261.410 and 261.411.

(b) A generator of hazardous secondary material, or an intermediate or reclamation facility that accumulates more than 6000 kg of hazardous secondary material at any time must comply with §§ 261.410 and 261.420.

■ 14. Section 261.410 is amended by revising paragraphs (e), (f)(1) introductory text, and (f)(2) to read as follows:

§ 261.410 Preparedness and prevention.

* * * * *

(e) *Required aisle space.* The hazardous secondary material generator or intermediate or reclamation facility must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.

(f) * * *

(1) The hazardous secondary material generator or an intermediate or reclamation facility must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential

need for the services of these organizations:

* * * * *

(2) Where State or local authorities decline to enter into such arrangements, the hazardous secondary material generator or an intermediate or reclamation facility must document the refusal in the operating record.

■ 15. Section 261.411 is amended by revising the introductory text and paragraphs (b) introductory text, (c), and (d)(3) introductory text to read as follows:

§ 261.411 Emergency procedures for facilities generating or accumulating 6000 kg or less of hazardous secondary material.

A generator or an intermediate or reclamation facility that generates or accumulates 6000 kg or less of hazardous secondary material must comply with the following requirements:

* * * * *

(b) The generator or intermediate or reclamation facility must post the following information next to the telephone:

* * * * *

(c) The generator or an intermediate or reclamation facility must ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies;

(d) * * *

(3) In the event of a fire, explosion, or other release which could threaten human health outside the facility or when the generator or an intermediate or reclamation facility has knowledge that a spill has reached surface water, the generator or an intermediate or reclamation facility operating under a verified recycler variance under § 260.31(d) of this subchapter must immediately notify the National Response Center (using their 24-hour toll free number 800/424–8802). The report must include the following information:

* * * * *

■ 16. Section 261.420 is amended by revising the introductory text and paragraphs (a)(1) and (b)(2) and (3) to read as follows:

§ 261.420 Contingency planning and emergency procedures for facilities generating or accumulating more than 6000 kg of hazardous secondary material.

A generator or an intermediate or reclamation facility that generates or accumulates more than 6000 kg of hazardous secondary material must comply with the following requirements:

(a) * * *

(1) Each generator or an intermediate or reclamation facility that accumulates more than 6000 kg of hazardous secondary material must have a contingency plan for his facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous secondary material or hazardous secondary material constituents to air, soil, or surface water.

* * * * *

(b) * * *

(2) If the generator or an intermediate or reclamation facility accumulating more than 6000 kg of hazardous secondary material has already prepared a Spill Prevention, Control, and Countermeasures (SPCC) Plan in accordance with part 112 of this chapter, or some other emergency or contingency plan, he need only amend that plan to incorporate hazardous waste management provisions that are sufficient to comply with the requirements of this part. The hazardous secondary material generator or an intermediate or reclamation facility operating under a verified recycler variance under § 260.31(d) of this subchapter may develop one contingency plan which meets all regulatory requirements. EPA recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance (''One Plan''). When modifications are made to non-RCRA provisions in an integrated contingency plan, the changes do not trigger the need for a RCRA permit modification.

(3) The plan must describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and local emergency response teams to coordinate emergency services, pursuant to § 261.410(f).

* * * * *

■ 17. Section 261.1033 is amended by revising paragraph (n)(1)(i) as follows:

§ 261.1033 Standards: Closed-vent systems and control devices.

* * * * *

(n) * * *

(1) * * *

(i) The owner or operator of the unit has been issued a final permit under 40 CFR part 270 which implements the requirements of 40 CFR part 264, subpart X; or

* * * * *

■ 18. Section 261.1083 is amended by revising paragraphs (a)(1) introductory text, (a)(1)(i), and (c)(4) to read as follows:

§ 261.1083 Material determination procedures.

(a) * * *

(1) Determining average VO concentration at the point of material origination. A remanufacturer or other person that stores or treats the hazardous secondary material shall determine the average VO concentration at the point of material origination for each hazardous secondary material placed in a hazardous secondary material management unit exempted under the provisions of § 261.1082(c) from using air emission controls in accordance with standards specified in §§ 261.1084 through 261.1087, as applicable to the hazardous secondary material management unit.

(i) An initial determination of the average VO concentration of the material stream shall be made before the first time any portion of the material in the hazardous secondary material stream is placed in a hazardous secondary material management unit exempted under the provisions of § 261.1082(c) from using air emission controls, and thereafter an initial determination of the average VO concentration of the material stream shall be made for each averaging period that a hazardous secondary material is managed in the unit; and

* * * * *

(c) * * *

(4) Use of knowledge to determine the maximum organic vapor pressure of the hazardous secondary material. Documentation shall be prepared and recorded that presents the information used as the basis for the knowledge by the remanufacturer or other person that stores or treats the hazardous secondary material that the maximum organic vapor pressure of the hazardous secondary material is less than the maximum vapor pressure limit listed in § 261.1084(b)(1)(i) for the applicable tank design capacity category. An example of information that may be used is documentation that the hazardous secondary material is generated by a process for which at other locations it previously has been determined by direct measurement that the hazardous secondary material's waste maximum organic vapor pressure is less than the maximum vapor pressure limit for the appropriate tank design capacity category.

* * * * *

■ 19. Section 261.1084 is amended by revising paragraphs (j)(2)(i) through (iii) to read as follows:

§ 261.1084 Standards: tanks.

* * * * *

(j) * * *

(2) * * *

(i) The hazardous secondary material meets the average VO concentration conditions specified in § 261.1082(c) at the point of material origination.

(ii) The hazardous secondary material has been treated by an organic destruction or removal process to meet the requirements in § 264.1082(c)(2).

(iii) The hazardous secondary material meets the requirements of § 264.1082(c)(4).

* * * * *

■ 20. Section 261.1089 is amended by revising paragraphs (a), (f), and (g) to read as follows:

§ 261.1089 Recordkeeping requirements.

(a) Each remanufacturer or other person that stores or treats the hazardous secondary material subject to requirements of this subpart shall record and maintain the information specified in paragraphs (b) through (j) of this section, as applicable to the facility. Except for air emission control equipment design documentation and information required by paragraphs (i) and (j) of this section, records required by this section shall be maintained at the facility for a minimum of 3 years. Air emission control equipment design documentation shall be maintained at the facility until the air emission control equipment is replaced or otherwise no longer in service. Information required by paragraphs (i) and (j) of this section shall be maintained at the facility for as long as the hazardous secondary material management unit is not using air emission controls specified in §§ 261.1084 through 261.1087 in accordance with the conditions specified in § 261.1080(a).

* * * * *

(f) The remanufacturer or other person that stores or treats the hazardous secondary material using a tank or container exempted under the hazardous secondary material organic concentration conditions specified in § 261.1082(c), shall prepare and maintain at the facility records documenting the information used for each material determination (*e.g.,* test results, measurements, calculations, and other documentation). If analysis results for material samples are used for the material determination, then the remanufacturer or other person that stores or treats the hazardous secondary material shall record the date, time, and location that each material sample is collected in accordance with applicable requirements of § 261.1083.

(g) A remanufacturer or other person that stores or treats the hazardous secondary material designating a cover as ''unsafe to inspect and monitor'' pursuant to § 261.1084(l) shall record and keep at facility the following information: The identification numbers for hazardous secondary material management units with covers that are designated as ''unsafe to inspect and monitor,'' the explanation for each cover stating why the cover is unsafe to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

* * * * *

■ 21. Amend appendix IX to part 261 by revising the entries for ''Bekaert Corp'' and ''Saturn Corporation'' in table 1 and by revising the entry for ''American Chrome & Chemical'' in table 2 to read as follows:

Appendix IX to Part 261—Wastes Excluded Under §§ 260.20 and 260.22

TABLE 1—WASTES EXCLUDED FROM NON-SPECIFIC SOURCES

Facility	Address	Waste description
*	*	*
Bekaert Corp	Dyersburg, TN	Dewatered wastewater treatment plant (WWTP) sludge (EPA Hazardous Waste Nos. F006) generated at a maximum rate of 1250 cubic yards per calendar year after May 27, 2004, and disposed in a Subtitle D landfill. For the exclusion to be valid, Bekaert must implement a verification testing program that meets the following paragraphs: (1) Delisting Levels: All leachable concentrations for those constituents must not exceed the maximum allowable concentrations in mg/l specified in this paragraph. Bekaert must use the leaching method specified at § 261.24 to measure constituents in the waste leachate. (A) Inorganic Constituents TCLP (mg/l): Cadmium—0.672; Chromium—5.0; Nickel—127; Zinc—1260.0. (B) Organic Constituents TCLP (mg/l): Methyl ethyl ketone—200.0. (2) Waste Holding and Handling: (A) Bekaert must accumulate the hazardous waste dewatered WWTP sludge in accordance with the applicable regulations of §§ 262.15, 262.16, and 262.17 of this subchapter, as applicable, and continue to dispose of the dewatered WWTP sludge as hazardous waste. (B) Once the first quarterly sampling and analyses event described in paragraph (3) is completed and valid analyses demonstrate that no constituent is present in the sample at a level which exceeds the delisting levels set in paragraph (1), Bekaert can manage and dispose of the dewatered WWTP sludge as nonhazardous according to all applicable solid waste regulations. (C) If constituent levels in any sample taken by Bekaert exceed any of the delisting levels set in paragraph (1), Bekaert must do the following: (i) notify EPA in accordance with paragraph (7) and (ii) manage and dispose the dewatered WWTP sludge as hazardous waste generated under Subtitle C of RCRA. (D) Quarterly Verification Testing Requirements: Upon this exclusion becoming final, Bekaert may begin the quarterly testing requirements of paragraph (3) on its dewatered WWTP sludge. (3) Quarterly Testing Requirements: Upon this exclusion becoming final, Bekaert may perform quarterly analytical testing by sampling and analyzing the dewatered WWTP sludge as follows: (A)(i) Collect four representative composite samples of the hazardous waste dewatered WWTP sludge at quarterly (ninety (90) day) intervals after EPA grants the final exclusion. The first composite sample may be taken at any time after EPA grants the final approval. (ii) Analyze the samples for all constituents listed in paragraph (1). Any roll-offs from which the composite sample is taken exceeding the delisting levels listed in paragraph (1) must be disposed as hazardous waste in a Subtitle C landfill. (iii) Within forty-five (45) days after taking its first quarterly sample, Bekaert will report its first quarterly analytical test data to EPA. If levels of constituents measured in the sample of the dewatered WWTP sludge do not exceed the levels set forth in paragraph (1) of this exclusion, Bekaert can manage and dispose the nonhazardous dewatered WWTP sludge according to all applicable solid waste regulations. (4) Annual Testing: (A) If Bekaert completes the quarterly testing specified in paragraph (3) above and no sample contains a constituent with a level which exceeds the limits set forth in paragraph (1), Bekaert may begin annual testing as follows: Bekaert must test one representative composite sample of the dewatered WWTP sludge for all constituents listed in paragraph (1) at least once per calendar year.

TABLE 1—WASTES EXCLUDED FROM NON-SPECIFIC SOURCES—Continued

Facility	Address	Waste description
		(B) The sample for the annual testing shall be a representative composite sample for all constituents listed in paragraph (1). (C) The sample for the annual testing taken for the second and subsequent annual testing events shall be taken within the same calendar month as the first annual sample taken. (5) Changes in Operating Conditions: If Bekaert significantly changes the process described in its petition or starts any processes that generate(s) the waste that may or could affect the composition or type of waste generated as established under paragraph (1) (by illustration, but not limitation, changes in equipment or operating conditions of the treatment process), it must notify the EPA in writing; it may no longer handle the wastes generated from the new process as nonhazardous until the wastes meet the delisting levels set in paragraph (1) and it has received written approval to do so from the EPA. (6) Data Submittals: Bekaert must submit the information described below. If Bekaert fails to submit the required data within the specified time or maintain the required records on-site for the specified time, the EPA, at its discretion, will consider this sufficient basis to reopen the exclusion as described in paragraph (7). Bekaert must: (A) Submit the data obtained through paragraph (3) to the Chief, North Section, RCRA Enforcement and Compliance Branch, Waste Division, U. S. Environmental Protection Agency Region 4, 61 Forsyth Street, SW., Atlanta, Georgia, 30303, within the time specified. (B) Compile records of analytical data from paragraph (3), summarized, and maintained on-site for a minimum of five years. (C) Furnish these records and data when either the EPA or the State of Tennessee request them for inspection. (D) Send along with all data a signed copy of the following certification statement, to attest to the truth and accuracy of the data submitted: "Under civil and criminal penalty of law for the making or submission of false or fraudulent statements or representations (pursuant to the applicable provisions of the Federal Code, which include, but may not be limited to, 18 U.S.C. 1001 and 42 U.S.C. 6928), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the (those) identified section(s) of this document for which I cannot personally verify its (their) truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete. If any of this information is determined by the EPA in its sole discretion to be false, inaccurate or incomplete, and upon conveyance of this fact to the company, I recognize and agree that this exclusion of waste will be void as if it never had effect or to the extent directed by the EPA and that the company will be liable for any actions taken in contravention of the company's RCRA and CERCLA obligations premised upon the company's reliance on the void exclusion." (7) Reopener: (A) If, any time after disposal of the delisted waste Bekaert possesses or is otherwise made aware of any environmental data (including but not limited to leachate data or ground water monitoring data) or any other data relevant to the delisted waste indicating that any constituent identified for the delisting verification testing is at level higher than the delisting level allowed by the Regional Administrator or his delegate in granting the petition, then the facility must report the data, in writing, to the Regional Administrator or his delegate within ten (10) days of first possessing or being made aware of that data. (B) If either the quarterly or annual testing of the waste does not meet the delisting requirements in paragraph (1), Bekaert must report the data, in writing, to the Regional Administrator or his delegate within ten (10) days of first possessing or being made aware of that data. (C) If Bekaert fails to submit the information described in paragraphs (5), (6)(A) or (6)(B) or if any other information is received from any source, the Regional Administrator or his delegate will make a preliminary determination as to whether the reported information requires the EPA action to protect human health or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment. (D) If the Regional Administrator or his delegate determines that the reported information requires action the EPA, the Regional Administrator or his delegate will notify the facility in writing of the actions the Regional Administrator or his delegate believes are necessary to protect human health and the environment. The notification shall include a statement of the proposed action and a statement providing the facility with an opportunity to present information as to why the proposed the EPA action is not necessary. The facility shall have ten (10) days from the date of the Regional Administrator or his delegate's notice to present such information. (E) Following the receipt of information from the facility described in paragraph (6)(D) or (if no information is presented under paragraph (6)(D)) the initial receipt of information described in paragraphs (5), (6)(A) or (6)(B), the Regional Administrator or his delegate will issue a final written determination describing the EPA actions that are necessary to protect human health or the environment. Any required action described in the Regional Administrator or his delegate's determination shall become effective immediately, unless the Regional Administrator or his delegate provides otherwise. (8) Notification Requirements: Bekaert must do following before transporting the delisted waste: (A) Provide a one-time written notification to any State Regulatory Agency to which or through which it will transport the delisted waste described above for disposal, sixty (60) days before beginning such activities. (B) Update the one-time written notification if Bekaert ships the delisted waste into a different disposal facility. (C) Failure to provide this notification will result in a violation of the delisting variance and a possible revocation of the decision.
*	*	* * * * *
Saturn Corporation	Spring Hill, Tennessee	Dewatered wastewater treatment plant (WWTP) sludge (EPA Hazardous Waste No. F019) generated at a maximum rate of 3,000 cubic yards per calendar year. The sludge must be disposed in a lined, Subtitle D landfill with leachate collection that is licensed, permitted, or otherwise authorized to accept the delisted WWTP sludge in accordance with 40 CFR part 258. The exclusion becomes effective on December 23, 2005. For the exclusion to be valid, Saturn must implement a verification testing program that meets the following conditions:

TABLE 1—WASTES EXCLUDED FROM NON-SPECIFIC SOURCES—Continued

Facility	Address	Waste description
		1. Delisting Levels: The constituent concentrations in an extract of the waste must not exceed the following maximum allowable concentrations in mg/l: antimony—0.494; arsenic—0.224; total chromium—3.71; lead—5.0; nickel—68; thallium—0.211; and zinc—673. Sample collection and analyses, including quality control procedures, must be performed using appropriate methods. As applicable to the method-defined parameters of concern, analyses requiring the use of SW–846 methods incorporated by reference in 40 CFR 260.11 must be used without substitution. As applicable, the SW–846 methods might include Methods 0010, 0011, 0020, 0023A, 0030, 0031, 0040, 0050, 0051, 0060, 0061, 1010B, 1020C, 1110A, 1310B, 1311, 1312, 1320, 1330A, 9010C, 9012B, 9040C, 9045D, 9060A, 9070A, (uses EPA Method 1664, Rev. A), 9071B, and 9095B. Methods must meet Performance Based Measurement System Criteria in which the Data Quality Objectives are to demonstrate that representative samples of Saturn's sludge meet the delisting levels in this condition. 2. Waste Holding and Handling: (a) Saturn must accumulate the hazardous waste dewatered WWTP sludge in accordance with the applicable regulations of §§ 262.15, 262.16, and 262.17 of this subchapter, and continue to dispose of the dewatered WWTP sludge as hazardous waste until the results of the first quarterly verification testing are available. (b) After the first quarterly verification sampling event described in Condition (3) has been completed and the laboratory data demonstrates that no constituent is present in the sample at a level which exceeds the delisting levels set in Condition (1), Saturn can manage and dispose of the dewatered WWTP sludge as nonhazardous according to all applicable solid waste regulations. (c) If constituent levels in any sample taken by Saturn exceed any of the delisting levels set in Condition (1), Saturn must do the following: (i) Notify EPA in accordance with Condition (7) and (ii) Manage and dispose the dewatered WWTP sludge as hazardous waste generated under Subtitle C of RCRA. 3. Quarterly Testing Requirements: Upon this exclusion becoming final, Saturn may perform quarterly analytical testing by sampling and analyzing the dewatered WWTP sludge as follows: (i) Collect one representative composite sample (consisting of four grab samples) of the hazardous waste dewatered WWTP sludge at any time after EPA grants the final delisting. In addition, collect the second, third, and fourth quarterly samples at approximately ninety (90)-day intervals after EPA grants the final exclusion. (ii) Analyze the samples for all constituents listed in Condition (1). Any roll-offs from which the composite sample is taken exceeding the delisting levels listed in Condition (1) must be disposed as hazardous waste in a Subtitle C landfill. (iii) Within forty-five (45) days after taking its first quarterly sample, Saturn will report its first quarterly analytical test data to EPA and will include the certification statement required in condition (6). If levels of constituents measured in the sample of the dewatered WWTP sludge do not exceed the levels set forth in Condition (1) of this exclusion, Saturn can manage and dispose the nonhazardous dewatered WWTP sludge according to all applicable solid waste regulations. 4. Annual Verification Testing: (i) If Saturn completes the quarterly testing specified in Condition (3) above, and no sample contains a constituent with a level which exceeds the limits set forth in Condition (1), Saturn may begin annual verification testing on an annual basis. Saturn must collect and analyze one sample of the WWTP sludge on an annual basis as follows: Saturn must test one representative composite sample of the dewatered WWTP sludge for all constituents listed in Condition (1) at least once per calendar year. (ii) The sample collected for annual verification testing shall be a representative composite sample consisting of four grab samples that will be collected in accordance with the appropriate methods described in Condition (1). (iii) The sample for the annual testing for the second and subsequent annual testing events shall be collected within the same calendar month as the first annual verification sample. Saturn will report the results of the annual verification testing to EPA on an annual basis and will include the certification statement required by Condition (6). 5. Changes in Operating Conditions: Saturn must notify EPA in writing when significant changes in the manufacturing or wastewater treatment processes are implemented. EPA will determine whether these changes will result in additional constituents of concern. If so, EPA will notify Saturn in writing that Saturn's sludge must be managed as hazardous waste F019 until Saturn has demonstrated that the wastes meet the delisting levels set forth in Condition (1) and any levels established by EPA for the additional constituents of concern, and Saturn has received written approval from EPA. If EPA determines that the changes do not result in additional constituents of concern, EPA will notify Saturn, in writing, that Saturn must verify that Saturn's sludge continues to meet Condition (1) delisting levels. 6. Data Submittals: Saturn must submit data obtained through verification testing at Saturn or as required by other conditions of this rule to: Chief, North Section, RCRA Enforcement and Compliance Branch, Waste Management Division, U.S. Environmental Protection Agency Region 4, Sam Nunn Atlanta Federal Center, 61 Forsyth Street SW, Atlanta, Georgia 30303. If Saturn fails to submit the required data within the specified time or maintain the required records on-site for the specified time, the EPA, at its discretion, will consider this sufficient basis to re-open the exclusion as described in Condition (7). Saturn must: (A) Submit the data obtained through Condition (3) within the time specified. The quarterly verification data must be submitted to EPA in accordance with Condition (3). The annual verification data and certification statement of proper disposal must be submitted to EPA annually upon the anniversary of the effective date of this exclusion. All data must be accompanied by a signed copy of the certification statement in 40 CFR 260.22(i)(12). (B) Compile, Summarize, and Maintain Records: Saturn must compile, summarize, and maintain at Saturn records of operating conditions and analytical data records of analytical data from Condition (3), summarized, and maintained on-site for a minimum of five years. Saturn must furnish these records and data when either the EPA or the State of Tennessee requests them for inspection. (C) Send along with all data a signed copy of the following certification statement, to attest to the truth and accuracy of the data submitted: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for getting the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for sending false information, including the possibility of fine and imprisonment." 7. Reopener. (A) If, at any time after disposal of the delisted waste, Saturn possesses or is otherwise made aware of any data (including but not limited to leachate data or groundwater monitoring data) relevant to the delisted WWTP sludge at Saturn indicating that any constituent is at a level in the leachate higher than the specified delisting level or TCLP regulatory level, then Saturn must report the data, in writing, to the Regional Administrator within ten (10) days of first possessing or being made aware of that data.

TABLE 1—WASTES EXCLUDED FROM NON-SPECIFIC SOURCES—Continued

Facility	Address	Waste description
		(B) Based upon the information described in Paragraph (A) and any other information received from any source, the EPA Regional Administrator will make a preliminary determination as to whether the reported information requires EPA action to protect human health or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment. (C) If the Regional Administrator determines that the reported information does require EPA action, the Regional Administrator will notify Saturn in writing of the actions the Regional Administrator believes are necessary to protect human health and the environment. The notification shall include a statement of the proposed action and a statement providing Saturn with an opportunity to present information as to why the proposed EPA action is not necessary. Saturn shall have ten (10) days from the date of the Regional Administrator's notice to present the information. (D) Following the receipt of information from Saturn, or if Saturn presents no further information after 10 days, the Regional Administrator will issue a final written determination describing the EPA actions that are necessary to protect human health or the environment. Any required action described in the Regional Administrator's determination shall become effective immediately, unless the Regional Administrator provides otherwise. 8. Notification Requirements: Before transporting the delisted waste, Saturn must provide a one-time written notification to any State Regulatory Agency to which or through which it will transport the delisted WWTP sludge for disposal. The notification will be updated if Saturn transports the delisted WWTP sludge to a different disposal facility. Failure to provide this notification will result in a violation of the delisting variance and a possible revocation of the decision.
*	*	* * * * *

TABLE 2—WASTES EXCLUDED FROM SPECIFIC SOURCES

Facility	Address	Waste description
American Chrome & Chemical.	Corpus Christi, Texas	Dewatered sludge (the EPA Hazardous Waste No. K006) generated at a maximum generation of 1450 cubic yards per calendar year after September 21, 2004 and disposed in a Subtitle D landfill. ACC must implement a verification program that meets the following Paragraphs: (1) Delisting Levels: All leachable constituent concentrations must not exceed the following levels (mg/l). The petitioner must use the method specified in § 261.24 to measure constituents in the waste leachate. Dewatered wastewater sludge: Arsenic-0.0377; Barium-100.0; Chromium-5.0; Thallium-0.355; Zinc-1130.0. (2) Waste Holding and Handling: (A) ACC is a 90 day facility and does not have a RCRA permit, therefore, ACC must store the dewatered sludge following the requirements specified in §§ 262.15, 262.16, and 262.17 of this subchapter, as applicable, or continue to dispose of as hazardous all dewatered sludge generated, until they have completed verification testing described in Paragraph (3), as appropriate, and valid analyses show that paragraph (1) is satisfied. (B) Levels of constituents measured in the samples of the dewatered sludge that do not exceed the levels set forth in Paragraph (1) are non-hazardous. ACC can manage and dispose the non-hazardous dewatered sludge according to all applicable solid waste regulations. (C) If constituent levels in a sample exceed any of the delisting levels set in Paragraph (1), ACC must retreat the batches of waste used to generate the representative sample until it meets the levels. ACC must repeat the analyses of the treated waste. (D) If the facility does not treat the waste or retreat it until it meets the delisting levels in Paragraph (1), ACC must manage and dispose the waste generated under Subtitle C of RCRA. (E) The dewatered sludge must pass paint filter test as described in SW 846, Method 9095 or another appropriate method found in a reliable source before it is allowed to leave the facility. ACC must maintain a record of the actual volume of the dewatered sludge to be disposed of-site according to the requirements in Paragraph (5). (3) Verification Testing Requirements: ACC must perform sample collection and analyses, including quality control procedures, according to appropriate methods such as those found in SW–846 or other reliable sources (with the exception of analyses requiring the use of SW–846 methods incorporated by reference in 40 CFR 260.11, which must be used without substitution. ACC must conduct verification testing each time it decides to evacuate the tank contents. Four (4) representative composite samples shall be collected from the dewatered sludge. ACC shall analyze the verification samples according to the constituent list specified in Paragraph (1) and submit the analytical results to EPA within 10 days of receiving the analytical results. If the EPA determines that the data collected under this Paragraph do not support the data provided for the petition, the exclusion will not cover the generated wastes. The EPA will notify ACC the decision in writing within two weeks of receiving this information. (4) Changes in Operating Conditions: If ACC significantly changes the process described in its petition or starts any processes that may or could affect the composition or type of waste generated as established under Paragraph (1) (by illustration, but not limitation, changes in equipment or operating conditions of the treatment process), they must notify the EPA in writing; they may no longer handle the wastes generated from the new process as nonhazardous until the test results of the wastes meet the delisting levels set in Paragraph (1) and they have received written approval to do so from the EPA. (5) Data Submittals: ACC must submit the information described below. If ACC fails to submit the required data within the specified time or maintain the required records on-site for the specified time, the EPA, at its discretion, will consider this sufficient basis to reopen the exclusion as described in Paragraph 6. ACC must: (A) Submit the data obtained through Paragraph 3 to the Section Chief, Corrective Action and Waste Minimization Section, Environmental Protection Agency, 1445 Ross Avenue, Dallas, Texas 75202–2733, Mail Code, (6PD–C) within the time specified. (B) Compile records of operating conditions and analytical data from Paragraph (3), summarized, and maintained on-site for a minimum of five years. (C) Furnish these records and data when the EPA or the State of Texas request them for inspection.

TABLE 2—WASTES EXCLUDED FROM SPECIFIC SOURCES—Continued

Facility	Address	Waste description
		(D) Send along with all data a signed copy of the following certification statement, to attest to the truth and accuracy of the data submitted: Under civil and criminal penalty of law for the making or submission of false or fraudulent statements or representations (pursuant to the applicable provisions of the Federal Code, which include, but may not be limited to, 18 U.S.C. 1001 and 42 U.S.C. 6928), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the (those) identified section(s) of this document for which I cannot personally verify its (their) truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete. If any of this information is determined by the EPA in its sole discretion to be false, inaccurate or incomplete, and upon conveyance of this fact to the company, I recognize and agree that this exclusion of waste will be void as if it never had effect or to the extent directed by the EPA and that the company will be liable for any actions taken in contravention of the company's RCRA and CERCLA obligations premised upon the company's reliance on the void exclusion. (6) Reopener: (A) If, any time after disposal of the delisted waste, ACC possesses or is otherwise made aware of any environmental data (including but not limited to leachate data or ground water monitoring data) or any other data relevant to the delisted waste indicating that any constituent identified for the delisting verification testing is at level higher than the delisting level allowed by the Division Director in granting the petition, then the facility must report the data, in writing, to the Division Director within 10 days of first possessing or being made aware of that data. (B) If the verification testing of the waste does not meet the delisting requirements in Paragraph 1, ACC must report the data, in writing, to the Division Director within 10 days of first possessing or being made aware of that data. (C) If ACC fails to submit the information described in paragraphs (5), (6)(A), or (6)(B) or if any other information is received from any source, the Division Director will make a preliminary determination as to whether the reported information requires Agency action to protect human health or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment. (D) If the Division Director determines that the reported information does require Agency action, the Division Director will notify the facility in writing of the actions the Division Director believes are necessary to protect human health and the environment. The notice shall include a statement of the proposed action and a statement providing the facility with an opportunity to present information as to why the proposed Agency action is not necessary. The facility shall have 10 days from the date of the Division Director's notice to present such information. (E) Following the receipt of information from the facility described in paragraph (6)(D) or (if no information is presented under paragraph (6)(D)) the initial receipt of information described in paragraphs (5), (6)(A), or (6)(B), the Division Director will issue a final written determination describing the Agency actions that are necessary to protect human health or the environment. Any required action described in the Division Director's determination shall become effective immediately, unless the Division Director provides otherwise. (7) Notification Requirements: ACC must do the following before transporting the delisted waste: Failure to provide this notification will result in a violation of the delisting petition and a possible revocation of the decision. (A) Provide a one-time written notification to any State Regulatory Agency to which or through which they will transport the delisted waste described above for disposal, 60 days before beginning such activities. If ACC transports the excluded waste to or manages the waste in any state with delisting authorization, ACC must obtain delisting authorization from that state before it can manage the waste as nonhazardous in the state. (B) Update the one-time written notification if they ship the delisted waste to a different disposal facility. (C) Failure to provide the notification will result in a violation of the delisting variance and a possible revocation of the exclusion.
*	*	* * * * * *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

■ 22. The authority for part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922–6925, 6937, 6938 and 6939g.

■ 23. Section 262.1 is amended by revising the definition of ''Condition for exemption'' to read as follows:

§ 262.1 Terms used in this part.

* * * * *

Condition for exemption means any requirement in § 262.14, § 262.15, § 262.16, § 262.17, § 262.70, or subpart K or L of this part that states an event, action, or standard that must occur or be met in order to obtain an exemption from any applicable requirement in parts 124, 264 through 268, and 270 of this chapter, or from any requirement for notification under section 3010 of RCRA for treatment storage, and disposal facilities.

* * * * *

■ 24. Section 262.10 is amended by:

■ a. Revising paragraphs (a)(2) introductory text and (k);

■ b. Redesignating notes 1 and 2 following paragraph (l) as notes 1 and 2 to § 262.10 appearing at the end of the section; and

■ c. Revising newly redesignated note 1 to § 262.10.

The revisions read as follows:

§ 262.10 Purpose, scope, and applicability.

(a) * * *

(2) A generator that accumulates hazardous waste on site is a person that stores hazardous waste; such generator is subject to the applicable requirements of parts 124, 264 through 267, and 270 of this chapter and section 3010 of RCRA for treatment, storage, and disposal facilities, unless it is one of the following:

* * * * *

(k) Generators in the Commonwealth of Massachusetts may comply with the State regulations regarding Class A recyclable materials in 310 C.M.R. 30.200, when authorized by the EPA under 40 CFR part 271, with respect to those recyclable materials and matters covered by the authorization, instead of complying with the hazardous waste accumulation conditions for exemption in §§ 262.15 through 262.17, the reporting requirements of § 262.41, the storage facility operator requirements of 40 CFR parts 264, 265, and 267, and the permitting requirements of 40 CFR part 270. Such generators must also comply with any other applicable requirements, including any applicable authorized State regulations governing hazardous

wastes not being recycled and any applicable Federal requirements which are being directly implemented by the EPA within Massachusetts pursuant to the Hazardous and Solid Waste Amendments of 1984.

* * * * *

Note 1 to § 262.10: The provisions of §§ 262.15 through 262.17 are applicable to the on-site accumulation of hazardous waste by generators. Therefore, the provisions of §§ 262.15 through 262.17 only apply to owners or operators who are shipping hazardous waste which they generated at that facility.

Note 2 to § 262.10: * * *

* * * * *

■ 25. Section 262.11 is amended by revising paragraphs (d) introductory text and (g) to read as follows:

§ 262.11 Hazardous waste determination and recordkeeping.

* * * * *

(d) The person then must also determine whether the waste exhibits one or more hazardous characteristics as identified in subpart C of 40 CFR part 261 by following the procedures in paragraph (d)(1) or (2) of this section, or a combination of both. Where a waste is both listed and exhibits a characteristic, the listed waste code is sufficient, provided that the listed waste code addresses the constituents and/or properties that cause the waste to exhibit the characteristic. Otherwise, the waste codes must be identified for all applicable listings and characteristics.

* * * * *

(g) *Identifying hazardous waste numbers for small and large quantity generators.* Consistent with paragraph (d) of this section, if the waste is determined to be hazardous, small quantity generators and large quantity generators must identify all applicable EPA hazardous waste numbers (EPA hazardous waste codes) in subparts C and D of part 261 of this subchapter. Prior to shipping the waste off site, the generator also must mark its containers with all applicable EPA hazardous waste numbers (EPA hazardous waste codes) according to § 262.32.

■ 26. Section 262.14 is amended by revising paragraphs (a)(3) and (4) to read as follows:

§ 262.14 Conditions for exemption for a very small quantity generator.

(a) * * *

(3) If the very small quantity generator accumulates at any time greater than 1 kilogram (2.2 lbs) of acute hazardous waste or 100 kilograms (220 lbs) of any residue or contaminated soil, water, or other debris resulting from the cleanup of a spill, into or on any land or water, of any acute hazardous waste listed in § 261.31 or § 261.33(e) of this subchapter, all quantities of that acute hazardous waste are subject to the following additional conditions for exemption and independent requirements:

(i) Such waste is held on site for no more than 90 days beginning on the date when the accumulated wastes exceed the amounts provided in paragraph (a)(3) of this section;

(ii) The conditions for exemption in § 262.17(a) through (g);

(iii) Notification as a ''very small quantity generator'' under § 262.18(a) through (c);

(iv) Preparation and use of the manifest in subpart B of this part;

(v) Pre-transport requirements in subpart C of this part;

(vi) Recordkeeping and reporting requirements in subpart D of this part; and

(vii) Requirements for transboundary movements of hazardous wastes in subpart H of this part.

(4) If the very small quantity generator accumulates at any time 1,000 kilograms (2,200 lbs) or greater of non-acute hazardous waste, all quantities of that hazardous waste are subject to the following additional conditions for exemption and independent requirements:

(i) Such waste is held on site for no more than 180 days, or 270 days, if applicable, beginning on the date when the accumulated waste exceed the amounts provided in paragraph (a)(4) of this section;

(ii) The quantity of waste accumulated on site never exceeds 6,000 kilograms (13,200 lbs);

(iii) The conditions for exemption in § 262.16(b)(2) through (f);

(iv) Notification as a ''very small quantity generator'' under § 262.18(a) through (c);

(v) Preparation and use of the manifest in subpart B of this part;

(vi) Pre-transport requirements in subpart C of this part;

(vii) Recordkeeping and reporting requirements in subpart D of this part; and

(viii) Requirements for transboundary movements of hazardous wastes in subpart H of this part.

* * * * *

■ 27. Section 262.16 is amended by revising the introductory text and paragraphs (b) introductory text, (b)(1), (b)(5) introductory text, and (b)(8)(iv)(A) and (B) to read as follows:

§ 262.16 Conditions for exemption for a small quantity generator that accumulates hazardous waste.

A small quantity generator may accumulate hazardous waste on site without a permit or interim status, and without complying with the requirements of parts 124, 264 through 267, and 270 of this chapter, or the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that all the conditions for exemption listed in this section are met:

* * * * *

(b) *Accumulation.* The generator accumulates hazardous waste on site for no more than 180 days, unless in compliance with the conditions for exemption for longer accumulation in paragraphs (c), (d), and (e) of this section. The following accumulation conditions also apply:

(1) *Accumulation limit.* The quantity of acute hazardous waste accumulated on site never exceeds 1 kilogram (2.2 pounds) and the quantity of non-acute hazardous waste accumulated on site never exceeds 6,000 kilograms (13,200 pounds);

* * * * *

(5) *Accumulation of hazardous waste in containment buildings.* If the waste is placed in containment buildings, the small quantity generator must comply with 40 CFR part 265 subpart DD. The generator must label its containment buildings with the words ''Hazardous Waste'' in a conspicuous place easily visible to employees, visitors, emergency responders, waste handlers, or other persons on site and also in a conspicuous place provide an indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristic(s) (*i.e.,* ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 CFR part 172, subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200; or a chemical hazard label consistent with the National Fire Protection Association code 704). The generator must also maintain:

* * * * *

(8) * * *

(iv) * * *

(A) Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, all personnel involved in the operation must have

immediate access (*e.g.,* direct or unimpeded access) to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required under paragraph (b)(8)(ii) of this section.

(B) In the event there is just one employee on the premises while the facility is operating, the employee must have immediate access (*e.g.,* direct or unimpeded access) to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio, capable of summoning external emergency assistance, *unless* such a device is not required under paragraph (b)(8)(ii) of this section.

* * * * *

■ 28. Section 262.17 is amended by revising the introductory text and paragraphs (a)(2), (a)(7)(i)(A), (a)(8)(i) introductory text, (a)(8)(i)(A), (a)(8)(iii)(A)(*4*), (b), (c) introductory text, (d), (e), and (f) introductory text to read as follows:

§ 262.17 Conditions for exemption for a large quantity generator that accumulates hazardous waste.

A large quantity generator may accumulate hazardous waste on site without a permit or interim status, and without complying with the requirements of parts 124, 264 through 267, and 270 of this chapter, or the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that all of the following conditions for exemption are met:

* * * * *

(a) * * *

(2) *Accumulation of hazardous waste in tanks.* If the waste is placed in tanks, the large quantity generator must comply with the applicable requirements of subpart J (except §§ 265.197(c) and 265.200 of this subchapter) as well as the applicable requirements of 40 CFR part 265, subparts AA through CC.

* * * * *

(7) * * *

(i)(A) Facility personnel must successfully complete a program of classroom instruction, online training (*e.g.,* computer-based or electronic), or on-the-job training that teaches them to perform their duties in a way that ensures compliance with this part. The large quantity generator must ensure that this program includes all the elements described in the document required under paragraph (a)(7)(iv)(C) of this section.

* * * * *

(8) * * *

(i) Notification for closure of a waste accumulation unit. A large quantity generator must perform one of the following when closing a waste accumulation unit but not undergoing final closure:

(A) Place a notice in the operating record within 30 days after closure of a unit that identifies the location of the waste accumulation unit being closed within the facility; or

* * * * *

(iii) * * *

(A) * * *

(*4*) If the generator demonstrates that any contaminated soils and wastes cannot be practicably removed or decontaminated as required in paragraph (a)(8)(iii)(A)(*2*) of this section, then the waste accumulation unit is considered to be a landfill and the generator must close the waste accumulation unit and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (§ 265.310 of this subchapter). In addition, for the purposes of closure, post-closure, and financial responsibility, such a waste accumulation unit is then considered to be a landfill, and the generator must meet all of the requirements for landfills specified in 40 CFR part 265, subparts G and H.

* * * * *

(b) *Accumulation time limit extension.* A large quantity generator who accumulates hazardous waste for more than 90 days is subject to the requirements of 40 CFR parts 124, 264 through 268, and part 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, unless it has been granted an extension to the 90-day period. Such extension may be granted by EPA if hazardous wastes must remain on site for longer than 90 days due to unforeseen, temporary, and uncontrollable circumstances. An extension of up to 30 days may be granted at the discretion of the Regional Administrator on a case-by-case basis.

(c) *Accumulation of F006.* A large quantity generator who also generates wastewater treatment sludges from electroplating operations that meet the listing description for the EPA hazardous waste number F006, may accumulate F006 waste on site for more than 90 days, but not more than 180 days without being subject to parts 124, 264 through 267, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that it complies with all of the following additional conditions for exemption:

* * * * *

(d) *F006 transported over 200 miles.* A large quantity generator who also generates wastewater treatment sludges from electroplating operations that meet the listing description for the EPA hazardous waste number F006, and who must transport this waste, or offer this waste for transportation, over a distance of 200 miles or more for off-site metals recovery, may accumulate F006 waste on site for more than 90 days, but not more than 270 days without being subject to parts 124, 264 through 267, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, if the large quantity generator complies with all of the conditions for exemption of paragraphs (c)(1) through (4) of this section.

(e) *F006 accumulation time extension.* A large quantity generator accumulating F006 in accordance with paragraphs (c) and (d) of this section who accumulates F006 waste on site for more than 180 days (or for more than 270 days if the generator must transport this waste, or offer this waste for transportation, over a distance of 200 miles or more), or who accumulates more than 20,000 kilograms of F006 waste on site is an operator of a storage facility and is subject to the requirements of 40 CFR parts 124, 264, 265, 267, and 270, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, unless the generator has been granted an extension to the 180-day (or 270-day if applicable) period or an exception to the 20,000 kilogram accumulation limit. Such extensions and exceptions may be granted by EPA if F006 waste must remain on site for longer than 180 days (or 270 days if applicable) or if more than 20,000 kilograms of F006 waste must remain on site due to unforeseen, temporary, and uncontrollable circumstances. An extension of up to 30 days or an exception to the accumulation limit may be granted at the discretion of the Regional Administrator on a case-by-case basis.

(f) *Consolidation of hazardous waste received from very small quantity generators.* Large quantity generators may accumulate on site hazardous waste received from very small quantity generators under control of the same person (as defined in § 260.10 of this subchapter), without a storage permit or interim status and without complying with the requirements of parts 124, 264

through 268, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that they comply with the following conditions. ''Control,'' for the purposes of this section, means the power to direct the policies of the generator, whether by the ownership of stock, voting rights, or otherwise, except that contractors who operate generator facilities on behalf of a different person shall not be deemed to ''control'' such generators.

* * * * *

Subpart D [Amended]

■ 29. Section 262.42 is amended by revising paragraphs (a)(1), (a)(2) introductory text, (b) (and the note following (b)) to read as follows:

§ 262.42 Exception reporting.

* * * * *

(a)(1) A large quantity generator who does not receive a copy of the manifest with the handwritten signature of the owner or operator of the designated facility within 35 days of the date the waste was accepted by the initial transporter must contact the transporter and/or the owner or operator of the designated facility to determine the status of the hazardous waste.

(2) A large quantity generator must submit an Exception Report to the EPA Regional Administrator for the Region in which the generator is located if he has not received a copy of the manifest with the handwritten signature of the owner or operator of the designated facility within 45 days of the date the waste was accepted by the initial transporter. The Exception Report must include:

* * * * *

(b) A small quantity generator of hazardous waste who does not receive a copy of the manifest with the handwritten signature of the owner or operator of the designated facility within 60 days of the date the waste was accepted by the initial transporter must submit a legible copy of the manifest, with some indication that the generator has not received confirmation of delivery, to the EPA Regional Administrator for the Region in which the generator is located.

Note 1 to paragraph (b): The submission to EPA need only be a handwritten or typed note on the manifest itself, or on an attached sheet of paper, stating that the return copy was not received.

* * * * *

■ 30. Section 262.82 is amended by revising paragraph (e)(2) to read as follows:

§ 262.82 General conditions.

* * * * *

(e) * * *

(2) For hand-delivery, the Office of Land and Emergency Management, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, International Branch (Mail Code 2255T), Environmental Protection Agency, William Jefferson Clinton West Building, Room 1329, 1301 Constitution Ave. NW, Washington, DC 20004.

■ 31. Section 262.200 is amended by revising the definition of ''Trained professional'' to read as follows:

§ 262.200 Definitions for this subpart.

* * * * *

Trained professional means a person who has completed the applicable RCRA training requirements of § 262.17(a)(7) for large quantity generators, or is knowledgeable about normal operations and emergencies in accordance with § 262.16(b)(9)(iii) for small quantity generators and for very small quantity generators that opt into subpart K of this part. A trained professional may be an employee of the eligible academic entity or may be a contractor or vendor who meets the requisite training requirements.

* * * * *

■ 32. Section 262.212 is amended by revising paragraph (e)(3) to read as follows:

§ 262.212 Making the hazardous waste determination at an on-site interim status or permitted treatment, storage, or disposal facility.

* * * * *

(e) * * *

(3) Count the hazardous waste toward the eligible academic entity's generator status, pursuant to § 262.13 in the calendar month that the hazardous waste determination was made, and

* * * * *

■ 33. Section 262.213 is amended by revising paragraph (a)(1) to read as follows:

§ 262.213 Laboratory clean-outs.

(a) * * *

(1) If the volume of unwanted material in the laboratory exceeds 55 gallons (or 1 quart of liquid reactive acutely hazardous unwanted material, or 1 kg of solid reactive acutely hazardous unwanted material), the eligible academic entity is not required to remove all unwanted materials from the laboratory within 10 calendar days of exceeding 55 gallons (or 1 quart of liquid reactive acutely hazardous unwanted material, or 1 kg of solid reactive acutely hazardous unwanted material), as required by § 262.208. Instead, the eligible academic entity must remove all unwanted materials from the laboratory within 30 calendar days from the start of the laboratory clean-out; and

* * * * *

■ 34. Section 262.232 is amended by revising the paragraphs (a)(5), (b)(4) introductory text, (b)(4)(ii)(C), and (b)(6)(iv) to read as follows:

§ 262.232 Conditions for a generator managing hazardous waste from an episodic event.

(a) * * *

(5) The very small quantity generator must comply with the hazardous waste manifest provisions of subpart B of this part and the recordkeeping provisions for small quantity generators in § 262.44 when it sends its episodic event hazardous waste off site to a designated facility, as defined in § 260.10 of this subchapter.

* * * * *

(b) * * *

(4) *Accumulation by small quantity generators.* A small quantity generator is prohibited from accumulating hazardous wastes generated from an episodic event on drip pads and in containment buildings. When accumulating hazardous waste generated from an episodic event in containers and tanks, the following conditions apply:

* * * * *

(ii) * * *

(C) Use inventory logs, monitoring equipment or other records to identify the date upon which each episodic event begins; and

* * * * *

(6) * * *

(iv) A description of how the hazardous waste was managed as well as the name of the RCRA-designated facility (as defined by § 260.10 of this subchapter) that received the hazardous waste;

* * * * *

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

■ 35. The authority for part 264 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, 6925, and 6939g.

■ 36. Section 264.1 is amended by revising paragraph (g)(3) and by removing and reserving paragraph (g)(12).

The revision reads as follows:

§ 264.1 Purpose, scope, and applicability.

* * * * *

(g) * * *

(3) A generator accumulating waste on site in compliance with § 262.14, § 262.15, § 262.16, § 262.17, or subpart K or L of part 262 of this subchapter.

* * * * *

§ 264.15 [Amended]

■ 37. Section 264.15 is amended by removing paragraph (b)(5).

■ 38. Section 264.72 is amended by revising paragraph (a)(3) to read as follows:

§ 264.72 Manifest discrepancies.

(a) * * *

(3) Container residues, which are residues that exceed the quantity limits for ''empty'' containers set forth in 40 CFR 261.7(b) and 266.507.

* * * * *

■ 39. Section 264.1030 is amended by revising paragraph (b)(3) to read as follows:

§ 264.1030 Applicability.

* * * * *

(b) * * *

(3) A unit that is exempt from permitting under the provisions of 40 CFR 262.17 (*i.e.,* a ''90-day'' tank or container) and is not a recycling unit under the provisions of 40 CFR 261.6.

* * * * *

■ 40. Section 264.1050 is amended by revising paragraph (b)(2) to read as follows:

§ 264.1050 Applicability.

* * * * *

(b) * * *

(2) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of 40 CFR 262.17 (*i.e.,* a hazardous waste recycling unit that is not a ''90-day'' tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of 40 CFR part 270; or

* * * * *

PART 265—INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

■ 41. The authority for part 265 continues to read as follows:

Authority: 42 U.S.C. 6905, 6906, 6912, 6922, 6923, 6924, 6925, 6935, 6936, 6937, and 6939g.

§ 265.1 [Amended]

■ 42. Section 265.1 is amended by removing and reserving paragraph (c)(15).

§ 265.71 [Amended]

■ 43. Section 265.71 is amended by removing the undesignated ''Comment'' paragraph following paragraph (c).

■ 44. Section 265.72 is amended by revising paragraph (a)(3) to read as follows:

§ 265.72 Manifest discrepancies.

(a) * * *

(3) Container residues, which are residues that exceed the quantity limits for ''empty'' containers set forth in 40 CFR 261.7(b) and 266.507.

* * * * *

PART 266—STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES

■ 45. The authority for part 266 continues to read as follows:

Authority: 42 U.S.C. 1006, 2002(a), 3001–3009, 3014, 3017, 6905, 6906, 6912, 6921, 6922, 6924–6927, 6934, and 6937.

■ 46. Section 266.100 is amended by revising paragraph (c)(3) to read as follows:

§ 266.100 Applicability.

* * * * *

(c) * * *

(3) Hazardous wastes that are exempt from regulation under §§ 261.4 and 261.6(a)(3)(iii) and (iv) of this subchapter, and hazardous wastes that are subject to the conditions for exemption for very small quantity generators under § 262.14 of this subchapter; and

* * * * *

■ 47. Section 266.108 is amended by redesignating the note following paragraph (c) as note 1 to § 266.108(c) and revising it to read as follows:

§ 266.108 Small quantity on-site burner exemption.

* * * * *

(c) * * *

Note 1 to paragraph (c): Hazardous wastes that are subject to the conditions for exemption for very small quantity generators under § 262.14 of this subchapter may be burned in an off-site device under the exemption provided by this section but must be included in the quantity determination for the exemption.

* * * * *

■ 48. Section 266.501 is amended by revising paragraph (d)(2) to read as follows:

§ 266.501 Applicability.

* * * * *

(d) * * *

(2) Sections 266.502(a), 266.503, 266.505 through 266.507, and 266.509 with respect to the management of potentially creditable hazardous waste pharmaceuticals that are prescription pharmaceuticals and are destined for a reverse distributor.

* * * * *

■ 49. Section 266.502 is amended by revising paragraphs (d)(4), (h) introductory text, (h)(3) and (4), (i)(2)(i)(A) introductory text, and (i)(2)(ii)(A) introductory text to read as follows:

§ 266.502 Standards for healthcare facilities managing non-creditable hazardous waste pharmaceuticals.

* * * * *

(d) * * *

(4) A healthcare facility may accumulate non-creditable hazardous waste pharmaceuticals and non-hazardous non-creditable waste pharmaceuticals in the same container, except that non-creditable hazardous waste pharmaceuticals prohibited from being combusted because of the dilution prohibition of § 268.3(c) of this subchapter (*i.e.,* metal-bearing waste codes listed in appendix XI of part 268 of this subchapter, unless one or more criteria in § 268.3(c)(1) through (6) are met), or because it is prohibited from being lab packed due to § 268.42(c) (*i.e.,* waste codes listed in appendix IV of part 268), must be accumulated in separate containers, and labeled with all applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes).

* * * * *

(h) *Procedures for healthcare facilities for managing rejected shipments of non-creditable hazardous waste pharmaceuticals.* A healthcare facility that sends a shipment of non-creditable hazardous waste pharmaceuticals to a designated facility with the understanding that the designated facility can accept and manage the waste, and later receives that shipment back as a rejected load in accordance with the manifest discrepancy provisions of § 264.72 or § 265.72 of this subchapter may accumulate the rejected non-creditable hazardous waste pharmaceuticals on site for up to an additional 90 calendar days provided

the rejected shipment is managed in accordance with paragraphs (d) and (e) of this section. Upon receipt of the rejected shipment, the healthcare facility must:

* * * * *

(3) Within 30 calendar days of receipt of the rejected shipment, send a copy of the manifest to the designated facility that returned the shipment to the healthcare facility; and

(4) Within 90 calendar days of receipt of the rejected shipment, transport or offer for transport the returned shipment in accordance with the shipping standards of § 266.508(a).

(i) * * *

(2) * * *

(i) * * *

(A) If a healthcare facility does not receive a copy of the manifest with the signature of the owner or operator of the designated facility within 60 calendar days of the date the non-creditable hazardous waste pharmaceuticals were accepted by the initial transporter, the healthcare facility must submit:

* * * * *

(ii) * * *

(A) If a healthcare facility does not receive a copy of the manifest for a rejected shipment of the non-creditable hazardous waste pharmaceuticals that is forwarded by the designated facility to an alternate facility (using appropriate manifest procedures), with the signature of the owner or operator of the alternate facility, within 60 calendar days of the date the non-creditable hazardous waste was accepted by the initial transporter forwarding the shipment of non-creditable hazardous waste pharmaceuticals from the designated facility to the alternate facility, the healthcare facility must submit:

* * * * *

■ 50. Section 266.503 is amended by revising paragraph (b)(1) to read as follows:

§ 266.503 Standards for healthcare facilities managing potentially creditable hazardous waste pharmaceuticals.

* * * * *

(b) * * *

(1) Is under the control of the same person (as defined in § 260.10 of this subchapter) as the very small quantity generator healthcare facility that is sending the potentially creditable hazardous waste pharmaceuticals off site (''control,'' for the purposes of this section, means the power to direct the policies of the healthcare facility, whether by the ownership of stock, voting rights, or otherwise, except that contractors who operate healthcare facilities on behalf of a different person as defined in § 260.10 of this subchapter shall not be deemed to ''control'' such healthcare facilities) or has a contractual or other documented business relationship whereby the receiving healthcare facility supplies pharmaceuticals to the very small quantity generator healthcare facility;

* * * * *

■ 51. Section 266.504 is amended by revising the section heading and paragraph (b) introductory text to read as follows:

§ 266.504 Healthcare facilities that are very small quantity generators for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste that are not operating under this subpart.

* * * * *

(b) *Off-site collection of hazardous waste pharmaceuticals generated by a healthcare facility that is a very small quantity generator.* A healthcare facility that is a very small quantity generator for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste may send its hazardous waste pharmaceuticals off site to another generator, provided:

* * * * *

■ 52. Section 266.505 is revised to read as follows:

§ 266.505 Prohibition on sewering hazardous waste pharmaceuticals.

All healthcare facilities—including very small quantity generators operating under § 262.14 of this subchapter in lieu of this subpart—and reverse distributors are prohibited from discharging hazardous waste pharmaceuticals to a sewer system that passes through to a publicly-owned treatment works. Healthcare facilities and reverse distributors remain subject to the prohibitions in 40 CFR 403.5(b).

■ 53. Section 266.506 is amended by revising the section heading and paragraphs (a)(2) and (b)(3)(iii) and (iv) to read as follows:

§ 266.506 Conditional exemption for hazardous waste pharmaceuticals that are also controlled substances and household waste pharmaceuticals collected by an authorized collector.

(a) * * *

(2) Household waste pharmaceuticals that are collected by an authorized collector (as defined by the Drug Enforcement Administration) registered with the Drug Enforcement Administration that commingles the household waste pharmaceuticals with controlled substances from an ultimate user (as defined by the Drug Enforcement Administration).

(b) * * *

(3) * * *

(iii) A permitted hospital, medical and infectious waste incinerator, subject to 40 CFR part 62, subpart HHH, or applicable state plan for existing hospital, medical and infectious waste incinerators, or 40 CFR part 60, subpart Ec, for new hospital, medical and infectious waste incinerators; or

(iv) A permitted commercial and industrial solid waste incinerator, subject to 40 CFR part 62, subpart III, or applicable state plan for existing commercial and industrial solid waste incinerators, or 40 CFR part 60, subpart CCCC, for new commercial and industrial solid waste incinerators; or

* * * * *

■ 54. Section 266.507 is amended by revising paragraphs (b), (c), and (d) to read as follows:

§ 266.507 Residues of hazardous waste pharmaceuticals in empty containers.

* * * * *

(b) *Syringes.* A syringe is considered empty and the residues are not regulated as hazardous waste under this subpart provided the contents have been removed by fully depressing the plunger of the syringe. At healthcare facilities operating under this subpart, if a syringe is not empty, the syringe must be placed with its remaining hazardous waste pharmaceuticals into a container that is managed and disposed of as a non-creditable hazardous waste pharmaceutical under this subpart and any applicable federal, state, and local requirements for sharps containers and medical waste.

(c) *Intravenous (IV) bags.* An IV bag is considered empty and the residues are not regulated as hazardous waste provided the pharmaceuticals in the IV bag have been fully administered to a patient, or if the IV bag held non-acute hazardous waste pharmaceuticals and is empty as defined in § 261.7(b)(1) of this subchapter. At healthcare facilities operating under this subpart, if an IV bag is not empty, the IV bag must be placed with its remaining hazardous waste pharmaceuticals into a container that is managed and disposed of as a non-creditable hazardous waste pharmaceutical under this subpart.

(d) *Other containers, including delivery devices.* At healthcare facilities operating under this subpart, hazardous waste pharmaceuticals remaining in all other types of unused, partially administered, or fully administered containers must be managed as non-creditable hazardous waste pharmaceuticals under this subpart, unless the container held non-acute

hazardous waste pharmaceuticals and is empty as defined in § 261.7(b)(1) or (2) of this subchapter. This includes, but is not limited to, residues in inhalers, aerosol cans, nebulizers, tubes of ointments, gels, or creams.

■ 55. Section 266.508 is amended by revising paragraphs (a)(1)(iii)(C) and (a)(2)(i) and (ii) to read as follows:

§ 266.508 Shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility of evaluated hazardous waste pharmaceuticals from a reverse distributor.

(a) * * *

(1) * * *

(iii) * * *

(C) Lab packs that will be incinerated in compliance with § 268.42(c) of this subchapter are not required to be marked with EPA hazardous waste numbers (*i.e.,* hazardous waste codes), except D004, D005, D006, D007, D008, D010, and D011, where applicable. A nationally recognized electronic system, such as bar coding or radio frequency identification tag, may be used to identify the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes).

* * * * *

(2) * * *

(i) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals is not required to list all applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22.

(ii) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals must write the word ''PHRM'' or ''PHARMS'' in Item 13 of EPA Form 8700–22. A healthcare facility may also include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22.

* * * * *

■ 56. Section 266.510 is amended by revising paragraphs (a)(9)(i)(C), (b)(1) and (2), (c)(2), (c)(4)(vi), (c)(5), (c)(7) introductory text, (c)(7)(iii) and (iv), (c)(9)(ii)(A)(*1*), (c)(9)(ii)(A)(*2*) introductory text, (c)(9)(ii)(B)(*1*), (c)(9)(ii)(B)(*2*) introductory text, and (c)(9)(ii)(B)(*2*)(*i*) to read as follows:

§ 266.510 Standards for the management of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals at reverse distributors.

* * * * *

(a) * * *

(9) * * *

(i) * * *

(C) The EPA identification number, name, and address of the healthcare facility (or other entity) that shipped the unauthorized waste, if available;

* * * * *

(b) * * *

(1) A reverse distributor that receives potentially creditable hazardous waste pharmaceuticals from a healthcare facility must send those potentially creditable hazardous waste pharmaceuticals to another reverse distributor within 180 calendar days after the potentially creditable hazardous waste pharmaceuticals have been evaluated or follow paragraph (c) of this section for evaluated hazardous waste pharmaceuticals.

(2) A reverse distributor that receives potentially creditable hazardous waste pharmaceuticals from another reverse distributor must send those potentially creditable hazardous waste pharmaceuticals to a reverse distributor that is a pharmaceutical manufacturer within 180 calendar days after the potentially creditable hazardous waste pharmaceuticals have been evaluated or follow paragraph (c) of this section for evaluated hazardous waste pharmaceuticals.

* * * * *

(c) * * *

(2) *Inspections of on-site accumulation area.* A reverse distributor must inspect its on-site accumulation area at least once every seven calendar days, looking at containers for leaks and for deterioration caused by corrosion or other factors, as well as for signs of diversion.

* * * * *

(4) * * *

(vi) Accumulate evaluated hazardous waste pharmaceuticals that are prohibited from being combusted because of the dilution prohibition of § 268.3(c) of this subchapter (*i.e.,* metal-bearing waste codes listed in appendix XI of part 268 of this subchapter, unless one or more criteria in § 268.3(c)(1) through (6) are met), or because it is prohibited from being lab packed due to § 268.42(c) of this subchapter (*i.e.,* waste codes listed in appendix IV of part 268 of this subchapter), in separate containers from other evaluated hazardous waste pharmaceuticals at the reverse distributor.

(5) *Hazardous waste numbers.* Prior to shipping evaluated hazardous waste pharmaceuticals off site, all containers must be marked with the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes), except as provided in § 266.508(a)(1)(iii)(C). A nationally recognized electronic system, such as bar coding or radio frequency identification tag, may be used to identify the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes).

* * * * *

(7) *Procedures for a reverse distributor for managing rejected shipments.* A reverse distributor that sends a shipment of evaluated hazardous waste pharmaceuticals to a designated facility with the understanding that the designated facility can accept and manage the waste, and later receives that shipment back as a rejected load in accordance with the manifest discrepancy provisions of § 264.72 or § 265.72 of this subchapter, may accumulate the rejected evaluated hazardous waste pharmaceuticals on site for up to an additional 90 calendar days in the on-site accumulation area provided the rejected shipment is managed in accordance with paragraphs (a) and (c) of this section. Upon receipt of the rejected shipment, the reverse distributor must:

* * * * *

(iii) Within 30 calendar days of receipt of the rejected shipment of the evaluated hazardous waste pharmaceuticals, send a copy of the manifest to the designated facility that returned the shipment to the reverse distributor; and

(iv) Within 90 calendar days of receipt of the rejected shipment, transport or offer for transport the returned shipment of evaluated hazardous waste pharmaceuticals in accordance with the applicable shipping standards of § 266.508(a) or (b).

* * * * *

(9) * * *

(ii) * * *

(A) * * *

(*1*) If a reverse distributor does not receive a copy of the manifest with the signature of the owner or operator of the designated facility within 35 calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter, the reverse distributor must contact the transporter or the owner or operator of the designated facility to determine the status of the evaluated hazardous waste pharmaceuticals.

(*2*) A reverse distributor must submit an exception report to the EPA Regional Administrator for the Region in which the reverse distributor is located if it has not received a copy of the manifest with the signature of the owner or operator of the designated facility within 45 calendar days of the date the evaluated hazardous waste pharmaceutical was accepted by the initial transporter. The exception report must include:

* * * * *

(B) * * *

(*1*) A reverse distributor that does not receive a copy of the manifest with the signature of the owner or operator of the alternate facility within 35 calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter must contact the transporter or the owner or operator of the alternate facility to determine the status of the hazardous waste. The 35-day timeframe begins the date the evaluated hazardous waste pharmaceuticals are accepted by the transporter forwarding the hazardous waste shipment from the designated facility to the alternate facility.

(*2*) A reverse distributor must submit an Exception Report to the EPA Regional Administrator for the Region in which the reverse distributor is located if it has not received a copy of the manifest with the signature of the owner or operator of the alternate facility within 45 calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter. The 45-day timeframe begins the date the evaluated hazardous waste pharmaceuticals are accepted by the transporter forwarding the hazardous waste pharmaceutical shipment from the designated facility to the alternate facility. The Exception Report must include:

(*i*) A legible copy of the manifest for which the reverse distributor does not have confirmation of delivery; and

* * * * *

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

■ 57. The authority for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6924, 6925, 6927, 6939, and 6974.

§ 270.1 [Amended]

■ 58. Section 270.1 is amended by removing and reserving paragraph (c)(2)(ix).

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

■ 59. The authority for part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6926, and 6939g.

■ 60. In § 271.1, table 1 is amended by adding an entry for ''February 22, 2019'' in chronological order to read as follows:

§ 271.1 Purpose and scope.

* * * * *

TABLE 1—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Promulgation date	Title of regulation reference	Federal Register	Effective date
*	*	*	*
February 22, 2019 ...	Management Standards for Hazardous Waste Pharmaceuticals and Amendment to the P075 Listing for Nicotine: § 266.505.	84 FR 5816	August 21, 2019.

* * * * *

■ 61. Section 271.10 is amended by revising paragraph (c) to read as follows:

§ 271.10 Requirements for generators of hazardous wastes.

* * * * *

(c) The State program must require that generators who accumulate hazardous wastes for short periods of time comply with requirements that are equivalent to the requirements for accumulating hazardous wastes for short periods of time under 40 CFR 262.15, 262.16, or 262.17.

* * * * *

PART 441—DENTAL OFFICE POINT SOURCE CATEGORY

■ 62. The authority for part 441 continues to read as follows:

Authority: 33 U.S.C. 1251, 1311, 1314, 1316, 1317, 1318, 1342, and 1361. 42 U.S.C. 13101–13103.

■ 63. Section 441.50 is amended by revising paragraph (b)(3) to read as follows:

§ 441.50 Reporting and recordkeeping requirements.

* * * * *

(b) * * *

(3) Documentation of all dates that collected dental amalgam is picked up or shipped for proper disposal in accordance with 40 CFR 262.14(a)(5), and the name of the permitted or licensed treatment, storage or disposal facility receiving the amalgam retaining containers.

* * * * *

[FR Doc. 2023–14731 Filed 8–8–23; 8:45 am]

BILLING CODE 6560–50–P

(b) In such circumstances, the authorized officer shall solicit applications competitively by issuing a prospectus for persons to apply for a visitor services authorization. Notwithstanding Forest Service outfitting and guiding policy in Forest Service Handbook 2709.14, Chapter 50, when authorizations, including priority use permits for activities other than sport hunting and fishing, expire in accordance with their terms, they shall not be reissued if there is a need to limit use and when there is competitive interest by preferred operators.

* * * * *

Homer Wilkes,

Under Secretary, Natural Resources and Environment.

[FR Doc. 2023–26666 Filed 12–5–23; 8:45 am]

BILLING CODE 3411–15–P

LIBRARY OF CONGRESS

Copyright Royalty Board

37 CFR Part 386

[Docket No. 23–CRB–0010–SA–COLA (2024)]

Cost of Living Adjustment to Satellite Carrier Compulsory License Royalty Rates; Correction

AGENCY: Copyright Royalty Board (CRB), Library of Congress.

ACTION: Final rule; correction.

SUMMARY: This document corrects a final rule published in the **Federal Register** of November 29, 2023, regarding the cost of living adjustment (COLA) to the royalty rates that satellite carriers pay for a compulsory license under the Copyright Act.

DATES: *Effective* January 1, 2024.

FOR FURTHER INFORMATION CONTACT: Anita Brown, (202) 707–7658, *crb@loc.gov*.

SUPPLEMENTARY INFORMATION: In FR Doc. 2023–26122, appearing on page 83354 in the **Federal Register** of Wednesday, November 29, 2023, the following corrections are made:

§ 386.2 [Corrected]

■ 1. On page 83354, in the second column, in part 386, in amendment 2, the instruction ''Section 386.2 is amended by adding paragraphs (b)(1)(xiv) and (b)(2)(xiv) to read as follows:'' is corrected to read ''Section 386.2 is amended by adding paragraphs (b)(1)(xv) and (b)(2)(xv) to read as follows:''.

Dated: November 30, 2023.

David P. Shaw,

Chief Copyright Royalty Judge.

[FR Doc. 2023–26741 Filed 12–5–23; 8:45 am]

BILLING CODE 1410–72–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 261, 262, and 266

[EPA–HQ–OLEM–2023–0081; FRL 8687–03–OLEM]

RIN 2050–AH23

Hazardous Waste Generator Improvements Rule, the Hazardous Waste Pharmaceuticals Rule, and the Definition of Solid Waste Rule; Technical Corrections

AGENCY: Environmental Protection Agency (EPA).

ACTION: Partial withdrawal of direct final rule.

SUMMARY: Because the EPA received adverse comment on eight amendments in the direct final rule published on August 9, 2023, we are withdrawing amendments to specific provisions through correction to the direct final rule.

DATES: This correction is effective December 7, 2023.

FOR FURTHER INFORMATION CONTACT: Brian Knieser, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0516, (*knieser.brian@epa.gov*) or Kathy Lett, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0517, (*lett.kathy@epa.gov*).

SUPPLEMENTARY INFORMATION: Because the EPA received adverse comment on specific amendments, through this correction, we are withdrawing only those specific amendments from the direct final rule, Hazardous Waste Generator Improvements Rule, the Hazardous Waste Pharmaceuticals Rule, and the Definition of Solid Waste Rule; Technical Corrections, published on August 9, 2023 (88 FR 54086). We stated in that direct final rule that if we received adverse comment by the close of the comment period on October 10, 2023, the specific amendments in the direct final rule that are the subject of adverse comment would not take effect, and we would publish a timely withdrawal in the **Federal Register**. Because the EPA subsequently received adverse comment on eight amendments in that direct final rule, we are withdrawing only the eight affected amendments. All other amendments in that direct final rule will go into effect on the effective date (December 7, 2023). The eight specific amendments that are being withdrawn are:

1. Section 261.4(e)(1) introductory text related to sample waste generated or collected for the purpose of conducting treatability studies.
2. Section 262.11(d) introductory text related to identifying hazardous characteristics for listed hazardous wastes when the characteristic is already addressed by the listing.
3. Section 262.11(g) related to identifying hazardous characteristics for listed hazardous wastes when the characteristic is already addressed by the listing.
4. Section 262.16(b)(1) related to the accumulation limit for small quantity generators generating acute hazardous waste.
5. Section 262.17(a)(8)(i) introductory text related to LQG closure notification when closing a waste accumulation unit but not the whole facility.
6. Section 262.17(a)(8)(i)(A) related to LQG closure notification when closing a waste accumulation unit but not the whole facility.
7. Section 262.232(b)(6)(iv) related to adding ''RCRA-'' to the term ''designated facility'' to match the language of parallel provisions in this section.
8. Section 266.508(a)(2)(ii) related to allowing applicable EPA hazardous waste numbers (also known as waste codes) in addition to the required PHARMS code in item 13 of the hazardous waste manifest for shipments of hazardous waste pharmaceuticals from a healthcare facility subject to 40 CFR part 266 subpart P. We are also withdrawing language from this provision that allows the use of PHRM in lieu of PHARMS in item 13 of the hazardous waste manifest.

Except for the amendment to § 262.11 at instruction 25, which is withdrawn in full, because the provisions we are withdrawing appear in amendatory instructions affecting other provisions, we are correcting the corresponding amendments in full minus those provisions withdrawn.

The EPA published a parallel proposed rule on the same day as the direct final rule. The proposed rule invited comment on the substance of the direct final rule. We will address those comments in any subsequent final action, which will be based on the parallel proposed rule also published on

August 9, 2023. As stated in the direct final rule and the parallel proposed rule, we will not institute a second comment period on this action.

List of Subjects

40 CFR Part 261

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Hazardous waste, Intergovernmental relations, Licensing and registration, Reporting and recordkeeping requirements.

40 CFR Part 262

Environmental protection, Exports, Hazardous materials transportation, Hazardous waste, Imports, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

40 CFR Part 266

Environmental protection, Energy, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

■ For the reasons stated above, EPA is withdrawing amendments in the direct final rule published August 9, 2023, at 88 FR 54086, by making the following corrections:

Correction

■ In FR Rule Doc. No. 2023–14731, published August 9, 2023, at 88 FR 54086, make the following corrections:

■ 1. On page 54109, in the first column, amendatory instruction 25 amending § 262.11 is removed.

■ 2. Beginning on page 54100 and ending on page 54114, correct amendatory instructions 5 (§ 261.4), 27 (§ 262.16), 28 (§ 262.17), 34 (§ 262.232), and 55 (§ 266.508) to read as follows:

■ 5. Section 261.4 is amended by revising paragraphs (a)(25)(i)(I), (a)(25)(vi) and (vii), and (a)(25)(xi)(D) to read as follows:

§ 261.4 Exclusions.

(a) * * *

(25) * * *

(i) * * *

(I) The name of any countries of transit through which the hazardous secondary material will be sent and a description of the approximate length of time it will remain in such countries and the nature of its handling while there (for purposes of this section, the terms ''EPA Acknowledgment of Consent'', ''country of import'' and ''country of transit'' are used as defined in 40 CFR 262.81 with the exception that the terms in this section refer to hazardous secondary materials, rather than hazardous waste):

* * * * *

(vi) The export of hazardous secondary material under this paragraph (a)(25) is prohibited unless the hazardous secondary material generator receives from EPA an EPA Acknowledgment of Consent documenting the consent of the country of import to the receipt of the hazardous secondary material. Where the country of import objects to receipt of the hazardous secondary material or withdraws a prior consent, EPA will notify the hazardous secondary material generator in writing. EPA will also notify the hazardous secondary material generator of any responses from countries of transit.

(vii) Prior to each shipment, the hazardous secondary material generator or a U.S. authorized agent must:

(A) Submit Electronic Export Information (EEI) for each shipment to the Automated Export System (AES) or its successor system, under the International Trade Data System (ITDS) platform, in accordance with 15 CFR 30.4(b).

(B) Include the following items in the EEI, along with the other information required under 15 CFR 30.6:

(*1*) EPA license code;

(*2*) Commodity classification code per 15 CFR 30.6(a)(12);

(*3*) EPA consent number;

(*4*) Country of ultimate destination per 15 CFR 30.6(a)(5);

(*5*) Date of export per 15 CFR 30.6(a)(2);

(*6*) Quantity of waste in shipment and units for reported quantity, if required reporting units established by value for the reported commodity classification number are in units of weight or volume per 15 CFR 30.6(a)(15); or

(*7*) EPA net quantity reported in units of kilograms, if required reporting units established by value for the reported commodity classification number are not in units of weight or volume.

* * * * *

(xi) * * *

(D) By reclaimer and intermediate facility, for each hazardous secondary material exported, a description of the hazardous secondary material and the EPA hazardous waste number that would apply if the hazardous secondary material was managed as hazardous waste, the DOT hazard class, the name and U.S. EPA ID number (where applicable) for each transporter used, the consent number(s) under which the hazardous secondary material was shipped and for each consent number, the total amount of hazardous secondary material shipped and the number of shipments exported during the calendar year covered by the report;

* * * * *

■ 27. Section 262.16 is amended by revising the introductory text and paragraphs (b) introductory text, (b)(5) introductory text, and (b)(8)(iv)(A) and (B) to read as follows:

§ 262.16 Conditions for exemption for a small quantity generator that accumulates hazardous waste.

A small quantity generator may accumulate hazardous waste on site without a permit or interim status, and without complying with the requirements of parts 124, 264 through 267, and 270 of this chapter, or the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that all the conditions for exemption listed in this section are met:

* * * * *

(b) *Accumulation.* The generator accumulates hazardous waste on site for no more than 180 days, unless in compliance with the conditions for exemption for longer accumulation in paragraphs (c), (d), and (e) of this section. The following accumulation conditions also apply:

* * * * *

(5) *Accumulation of hazardous waste in containment buildings.* If the waste is placed in containment buildings, the small quantity generator must comply with 40 CFR part 265 subpart DD. The generator must label its containment buildings with the words ''Hazardous Waste'' in a conspicuous place easily visible to employees, visitors, emergency responders, waste handlers, or other persons on site and also in a conspicuous place provide an indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristic(s) (*i.e.,* ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 CFR part 172, subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200; or a chemical hazard label consistent with the National Fire Protection Association code 704). The generator must also maintain:

* * * * *

(8) * * *

(iv) * * *

(A) Whenever hazardous waste is being poured, mixed, spread, or

otherwise handled, all personnel involved in the operation must have immediate access (*e.g.,* direct or unimpeded access) to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required under paragraph (b)(8)(ii) of this section.

(B) In the event there is just one employee on the premises while the facility is operating, the employee must have immediate access (*e.g.,* direct or unimpeded access) to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio, capable of summoning external emergency assistance, unless such a device is not required under paragraph (b)(8)(ii) of this section.

* * * * *

■ 28. Section 262.17 is amended by revising the introductory text and paragraphs (a)(2), (a)(7)(i)(A), (a)(8)(iii)(A)(*4*), (b), (c) introductory text, (d), (e), and (f) introductory text to read as follows:

§ 262.17 Conditions for exemption for a large quantity generator that accumulates hazardous waste.

A large quantity generator may accumulate hazardous waste on site without a permit or interim status, and without complying with the requirements of parts 124, 264 through 267, and 270 of this chapter, or the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that all of the following conditions for exemption are met:

* * * * *

(a) * * *

(2) *Accumulation of hazardous waste in tanks.* If the waste is placed in tanks, the large quantity generator must comply with the applicable requirements of subpart J (except §§ 265.197(c) and 265.200 of this subchapter) as well as the applicable requirements of 40 CFR part 265, subparts AA through CC.

* * * * *

(7) * * *

(i)(A) Facility personnel must successfully complete a program of classroom instruction, online training (*e.g.,* computer-based or electronic), or on-the-job training that teaches them to perform their duties in a way that ensures compliance with this part. The large quantity generator must ensure that this program includes all the elements described in the document required under paragraph (a)(7)(iv)(C) of this section.

* * * * *

(8) * * *

(iii) * * *

(A) * * *

(*4*) If the generator demonstrates that any contaminated soils and wastes cannot be practicably removed or decontaminated as required in paragraph (a)(8)(iii)(A)(*2*) of this section, then the waste accumulation unit is considered to be a landfill and the generator must close the waste accumulation unit and perform postclosure care in accordance with the closure and post-closure care requirements that apply to landfills (§ 265.310 of this subchapter). In addition, for the purposes of closure, post-closure, and financial responsibility, such a waste accumulation unit is then considered to be a landfill, and the generator must meet all of the requirements for landfills specified in 40 CFR part 265, subparts G and H.

* * * * *

(b) *Accumulation time limit extension.* A large quantity generator who accumulates hazardous waste for more than 90 days is subject to the requirements of 40 CFR parts 124, 264 through 268, and part 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, unless it has been granted an extension to the 90-day period. Such extension may be granted by EPA if hazardous wastes must remain on site for longer than 90 days due to unforeseen, temporary, and uncontrollable circumstances. An extension of up to 30 days may be granted at the discretion of the Regional Administrator on a case-by-case basis.

(c) *Accumulation of F006.* A large quantity generator who also generates wastewater treatment sludges from electroplating operations that meet the listing description for the EPA hazardous waste number F006, may accumulate F006 waste on site for more than 90 days, but not more than 180 days without being subject to parts 124, 264 through 267, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that it complies with all of the following additional conditions for exemption:

* * * * *

(d) *F006 transported over 200 miles.* A large quantity generator who also generates wastewater treatment sludges from electroplating operations that meet the listing description for the EPA hazardous waste number F006, and who must transport this waste, or offer this waste for transportation, over a distance of 200 miles or more for off-site metals recovery, may accumulate F006 waste on site for more than 90 days, but not more than 270 days without being subject to parts 124, 264 through 267, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, if the large quantity generator complies with all of the conditions for exemption of paragraphs (c)(1) through (4) of this section.

(e) *F006 accumulation time extension.* A large quantity generator accumulating F006 in accordance with paragraphs (c) and (d) of this section who accumulates F006 waste on site for more than 180 days (or for more than 270 days if the generator must transport this waste, or offer this waste for transportation, over a distance of 200 miles or more), or who accumulates more than 20,000 kilograms of F006 waste on site is an operator of a storage facility and is subject to the requirements of 40 CFR parts 124, 264, 265, 267, and 270, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, unless the generator has been granted an extension to the 180-day (or 270-day if applicable) period or an exception to the 20,000 kilogram accumulation limit. Such extensions and exceptions may be granted by EPA if F006 waste must remain on site for longer than 180 days (or 270 days if applicable) or if more than 20,000 kilograms of F006 waste must remain on site due to unforeseen, temporary, and uncontrollable circumstances. An extension of up to 30 days or an exception to the accumulation limit may be granted at the discretion of the Regional Administrator on a case-by-case basis.

(f) *Consolidation of hazardous waste received from very small quantity generators.* Large quantity generators may accumulate on site hazardous waste received from very small quantity generators under control of the same person (as defined in § 260.10 of this subchapter), without a storage permit or interim status and without complying with the requirements of parts 124, 264 through 268, and 270 of this chapter, and the notification requirements of section 3010 of RCRA for treatment, storage, and disposal facilities, provided that they comply with the following conditions. "Control," for the purposes of this section, means the power to direct the policies of the generator, whether by the ownership of stock, voting rights, or otherwise, except that contractors who operate generator facilities on behalf of a different person

shall not be deemed to ''control'' such generators.

* * * * *

■ 34. Section 262.232 is amended by revising the paragraphs (a)(5), (b)(4) introductory text, and (b)(4)(ii)(C) to read as follows:

§ 262.232 Conditions for a generator managing hazardous waste from an episodic event.

(a) * * *

(5) The very small quantity generator must comply with the hazardous waste manifest provisions of subpart B of this part and the recordkeeping provisions for small quantity generators in § 262.44 when it sends its episodic event hazardous waste off site to a designated facility, as defined in § 260.10 of this subchapter.

* * * * *

(b) * * *

(4) *Accumulation by small quantity generators.* A small quantity generator is prohibited from accumulating hazardous wastes generated from an episodic event on drip pads and in containment buildings. When accumulating hazardous waste generated from an episodic event in containers and tanks, the following conditions apply:

* * * * *

(ii) * * *

(C) Use inventory logs, monitoring equipment or other records to identify the date upon which each episodic event begins; and

* * * * *

■ 55. Section 266.508 is amended by revising paragraphs (a)(1)(iii)(C) and (a)(2)(i) to read as follows:

§ 266.508 Shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility of evaluated hazardous waste pharmaceuticals from a reverse distributor.

(a) * * *

(1) * * *

(iii) * * *

(C) Lab packs that will be incinerated in compliance with § 268.42(c) of this subchapter are not required to be marked with EPA hazardous waste numbers (*i.e.,* hazardous waste codes), except D004, D005, D006, D007, D008, D010, and D011, where applicable. A nationally recognized electronic system, such as bar coding or radio frequency identification tag, may be used to identify the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes).

* * * * *

(2) * * *

(i) A healthcare facility shipping noncreditable hazardous waste pharmaceuticals is not required to list all applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22.

* * * * *

[FR Doc. 2023–26750 Filed 12–5–23; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 430 and 435

Office of the Secretary

45 CFR Part 16

[CMS–2447–IFC]

RIN 0938–AV26

Medicaid; CMS Enforcement of State Compliance With Reporting and Federal Medicaid Renewal Requirements Under Section 1902(tt) of the Social Security Act

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Interim final rule with comment period.

SUMMARY: This interim final rule with request for comments (IFC) implements reporting requirements and enforcement authorities in the Social Security Act (the Act) that were added by the Consolidated Appropriations Act, 2023 (CAA, 2023). CMS will use these new enforcement authorities as described in this rule if States fail to comply with the new reporting requirements added by the CAA, 2023 or with Federal Medicaid eligibility redetermination requirements during a timeframe that is generally aligned with the period when States are restoring eligibility and enrollment operations following the end of the Medicaid continuous enrollment condition under the Families First Coronavirus Response Act (FFCRA). The new enforcement authorities include requiring States to submit a corrective action plan, suspending disenrollments from Medicaid for procedural reasons, and imposing civil money penalties (CMPs). They also include applying a reduction to the State-specific Federal Medical Assistance Percentage (FMAP) for failure to meet reporting requirements.

DATES: These regulations are effective on December 6, 2023.

Comment date: To be assured consideration, comments must be received at one of the addresses provided below, by February 2, 2024.

ADDRESSES: In commenting, please refer to file code CMS–2447–IFC.

Comments, including mass comment submissions, must be submitted in *one* of the following three ways (please choose only *one* of the ways listed):

1. *Electronically.* You may submit electronic comments on this regulation to *http://www.regulations.gov.* Follow the ''Submit a comment'' instructions.

2. *By regular mail.* You may mail written comments to the following address ONLY: Centers for Medicare & Medicaid Services, Department of Health and Human Services, Attention: CMS–2447–IFC, P.O. Box 8016, Baltimore, MD 21244–8016.

Please allow sufficient time for mailed comments to be received before the close of the comment period.

3. *By express or overnight mail.* You may send written comments to the following address ONLY: Centers for Medicare & Medicaid Services, Department of Health and Human Services, Attention: CMS–2447–IFC, Mail Stop C4–26–05, 7500 Security Boulevard, Baltimore, MD 21244–1850.

For information on viewing public comments, see the beginning of the **SUPPLEMENTARY INFORMATION** section.

FOR FURTHER INFORMATION CONTACT: Abby Kahn, (410) 786–4321, *Abigail.Kahn@cms.hhs.gov,* or Anna Bonelli, (443) 615–1268, *Anna.Bonelli@cms.hhs.gov.*

SUPPLEMENTARY INFORMATION:

Inspection of Public Comments: All comments received before the close of the comment period are available for viewing by the public, including any personally identifiable or confidential business information that is included in a comment. We post all comments received before the close of the comment period on the following website as soon as possible after they have been received: *http://www.regulations.gov.* Follow the search instructions on that website to view public comments. CMS will not post on *Regulations.gov* public comments that make threats to individuals or institutions or suggest that the commenter will take actions to harm an individual. CMS continues to encourage individuals not to submit duplicative comments. We will post acceptable comments from multiple unique commenters even if the content is identical or nearly identical to other comments.

REFRIGERATION AND AIR CONDITIONING—Continued

End-use	Substitute	Decision	Further information [1]
Retail food refrigeration—Remote condensing units *(retrofit equipment only).*	R–471A	Acceptable	This substitute is a blend of 78.7 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene; (CAS Reg. No. 29118–24–9); 17.0 percent HFO–1336mzz(E), also known as *trans*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 66711–86–2); and 4.3 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–471A has a GWP of 144 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1". ASHRAE has established an OEL for the blend of 710 ppm (8-hr TWA). For the components of R–471A, OARS has established a WEEL of 400 ppm on an 8-hr TWA for HFO–1336mzz(E), AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).
Retail food refrigeration—Supermarket systems *(retrofit equipment only).*	R–471A	Acceptable	This substitute is a blend of 78.7 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene; (CAS Reg. No. 29118–24–9); 17.0 percent HFO–1336mzz(E), also known as *trans*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 66711–86–2); and 4.3 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–471A has a GWP of 144 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1". ASHRAE has established an OEL for the blend of 710 ppm (8-hr TWA). For the components of R–471A, OARS has established a WEEL of 400 ppm on an 8-hr TWA for HFO–1336mzz(E), AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).
Water coolers *(retrofit equipment only).*	R–480A	Acceptable	This substitute is a weighted blend of 5 percent CO_2, 86 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene CAS Reg. No. 29118–24–9), and 9 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–480A has a GWP of 291 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1." ASHRAE has adopted an OEL for the blend of 900 ppm (8-hr TWA). For the components of R–480A, OSHA has established a PEL for CO_2 of 5,000 ppm on an 8-hr TWA, AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).

[1] See recommendations in the manufacturer's SDS and guidance for all listed refrigerants.

FOAM BLOWING

End-use	Substitute	Decision	Further information [1]
Polystyrene: Extruded boardstock and billet.	Extruded polystyrene (XPS) foam blowing agent blends of 0 to 90 percent HFO–1336mzz(Z), 0 to 90 percent HFO–1234ze(E), 0 to 75 percent HFC–152a, and 0 to 90 percent CO_2.	Acceptable	HFO–1234ze(E) is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene (Chemical Abstracts Service Registry Number [CAS Reg. No.] 29118–24–9). HFO–1336mzz(Z) is also known as (Z)-1,1,1,4,4,4-hexafluoro-2-butene and *cis*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 692–49–9). HFC–152a is also known as 1,1-difluoroethane (CAS Reg. No. 75–37–6). CO_2 has CAS Reg. No. 124–38–9. These blends have 100-year GWPs from 1 to about 94, depending on the specific composition. Blends of these compounds anticipated to be used in manufacturing are flammable. The AIHA has established a WEEL of 1,000 ppm for HFC–152a on an eight-hour Time-Weighted Average (8-hr TWA). The OARS has established a WEEL of 500 ppm (8-hr TWA) for HFO–1336mzz(Z). The manufacturer of HFO–1234ze(E) has established an OEL of 800 ppm (8-hr TWA) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers has adopted an OEL of 800 ppm (8-hr TWA) for this compound. The U.S. OSHA has established a PEL of 5,000 ppm on an 8-hr TWA for CO_2.

[1] See recommendations in the manufacturer's SDS and guidance for all listed foam blowing agents.

[FR Doc. 2024–28307 Filed 12–10–24; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 261, 262, and 266

[EPA–HQ–OLEM–2023–0081; FRL 8687–04–OLEM]

RIN 2050–AH23

Hazardous Waste Generator Improvements Rule, the Hazardous Waste Pharmaceuticals Rule, and the Definition of Solid Waste Rule; Technical Corrections

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or the Agency) is finalizing five amendments that were withdrawn in its December 6, 2023, partial withdrawal of direct final rule. Due to receipt of adverse comments, the EPA withdrew eight amendments from the August 9, 2023, direct final rule that included revisions to the 2016 Hazardous Waste Generator Improvements Rule, the 2019 Hazardous Waste Pharmaceuticals Rule and the 2018 Vacatur of the Definition of Solid Waste Rule (88 FR 54086). The EPA is

responding to the relevant adverse comments in this action.

DATES: This final rule is effective on February 10, 2025.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2023–0081. All documents in the docket are listed on the *http://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI 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 form. Publicly available docket materials are available electronically through *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Kathy Lett, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0517, (*lett.kathy@epa.gov*) or Kristin Fitzgerald, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0512 (*fitzgerald.kristin@epa.gov*).

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

Entities potentially affected by this action include hazardous waste generators, treatment, storage, and disposal facilities, healthcare facilities, reverse distributors, importers/exporters of hazardous waste, and users of the transfer-based exclusion to the definition of solid waste. Also affected are States and EPA Regions implementing these RCRA hazardous waste regulations.

This discussion is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This discussion includes the types of entities that the EPA is now aware could potentially be regulated by this action. Other types of entities not included could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in Section IV of the preamble. If you have questions regarding the applicability of this action to a particular entity, consult the persons listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the agency taking?

This action finalizes five amendments that were included in its August 9, 2023, direct final rule that made technical corrections to three rulemakings related to the generation of hazardous waste: the 2016 Hazardous Waste Generator Improvements Rule, the 2019 Hazardous Waste Pharmaceuticals Rule, and the 2018 Vacatur of the Definition of Solid Waste Rule (88 FR 54086). Due to receipt of adverse comments, eight amendments were withdrawn in the EPA's December 6, 2023, partial withdrawal of direct final rule (88 FR 84710). EPA has evaluated the comments received on the amendments and is finalizing five of these amendments, found in §§ 261.4(e)(1), 262.16(b)(1), 262.17(a)(8)(i) introductory text, 262.17(a)(8)(i)(A) and 266.508(a)(2)(ii). These five provisions relate to the 2016 Hazardous Waste Generator Improvements Rule and the 2019 Hazardous Waste Pharmaceuticals Rule.

Finalizing these technical corrections will correct or clarify the regulations for generators and handlers of hazardous waste. The EPA is also responding in this preamble to the adverse comments on the items that we are finalizing in this action. The three provisions we are not finalizing will not go into effect with this action and the EPA is not responding to the adverse comments on these three provisions.

C. What is the agency's authority for taking this action?

This rule is authorized under sections 1004, 2002, 3001, 3002, 3003, 3004, 3005, 3006, and 3010, of the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6903, 6912, 6921, 6922, 6923, 6924, 6925, 6926, and 6930.

III. Background

In the EPA's August 9, 2023, direct final rule (88 FR 54086), EPA explained that the Agency views the minor fixes and clarifications included in the action as noncontroversial. However, EPA published a parallel proposed rule the same day that could serve as the proposed rule to adopt the provisions in the direct final rule if adverse comments were received. EPA stated that in this case, there would not be a second comment period on this action.

The direct final rule preamble also stated that if the Agency were to receive adverse comment on any individual correction, we would publish a timely withdrawal in the **Federal Register** informing the public about the specific regulatory paragraph or amendment that will not take effect.

The EPA received adverse comments on eight amendments from the direct final rule and withdrew them on December 6, 2023 (88 FR 84710). All corrections that were not withdrawn became effective on December 7, 2023.

IV. Provisions Being Finalized and Response to Comment

A. Section 261.4(e)(1)

The August 9, 2023, direct final rule identified a number of regulatory citations that were incorrect and outdated in the regulations for generators of hazardous waste and updated those citations. Section 261.4(e) provides requirements for management of samples used in treatability studies and included citations that needed to be updated. The list of corrections included revising § 261.4(e)(1) to replace the references to quantity determinations in §§ 261.5 and 262.34(d) with a reference to the counting requirements in § 262.13 and the accumulation limits in § 262.16(b)(1).

EPA received an adverse comment to this revision. The commenter stated that it appears that the revised citation in this location, which identifies which categories of generators do not need to count treatability sample weight towards generator accumulation limits was incomplete. The comment stated that the revised citation should point to the accumulation limits for very small quantity generators (VSQGs), large quantity generators (LQGs), and satellite accumulation areas (SAAs), not just SQGs.

EPA partially agrees with the commenter and is revising this citation to include references to §§ 262.14(a)(3) and (4), the accumulation limits for VSQGs accumulating acute and non-acute hazardous waste. The original language in this section referred to accumulation limits for VSQGs and SQGs and this revision reestablishes those two references. Generators accumulating waste at SAAs must include that waste in their monthly quantities for determining generator status, but the original regulatory language did not refer to the SAA requirements and LQGs do not have an accumulation limit. For these reasons, EPA is not amending the language to add any references to SAA or LQG requirements.

B. Section 262.16(b)(1)

The 2016 Generator Improvements rule established definitions for very small, small, and large quantity generators, reorganized the regulations for these categories of generators, and

clearly distinguished the generator categories—determined by how much hazardous waste is generated per calendar month at a site—from the conditions for exemption that specify limits for how much hazardous waste small and very small quantity generators can accumulate on site at any one time.

However, the small quantity generator conditions for exemption include an on-site accumulation limit of 6,000 kilograms for non-acute hazardous waste but do not specify an on-site accumulation limit for acute hazardous waste.

In the original 1980 hazardous waste generator regulations, there were only two categories of hazardous waste generator: small (generating less than 1,000 kilograms of hazardous waste per month) and large (generating more than 1,000 kilograms of hazardous waste per month). These pre-1986 small quantity generators had a total on-site hazardous waste accumulation limit of 6,000 kilograms of non-acute hazardous waste and one kilogram of acute hazardous waste. The 1986 rule that established the category and specific requirements for those generating between 100 kilograms and 1,000 kilograms per month (small quantity generators) (51 FR 10146; March 24, 1986) implemented the changes to the hazardous waste program required by the Hazardous and Solid Waste Amendments of 1984 (HSWA) and established a new category of ''conditionally exempt small quantity generator'' for those generating less than 100 kilograms of non-acute hazardous waste per month.

The scope of HSWA and the new regulations for conditionally exempt small quantity generators did not include acute hazardous waste. Therefore, generators generating less than one kilogram of acute hazardous waste per month are conditionally exempt small quantity generators and those generating more than one kilogram of acute hazardous waste per month are large quantity generators. There is no separate small quantity generator category based solely on generation of acute hazardous waste.

The EPA clarified the distinctions between the three generator categories in the 2016 Generator Improvements rule and stated that a small quantity generator can only generate up to one kilogram of acute hazardous waste in a calendar month, but it was not clear in the new language whether there is a limit on the amount of acute hazardous waste a small quantity generator can accumulate on site at any one time. Consistent with what has been historically allowed for generators of small amounts of acute hazardous waste since the 1980 regulations, in the August 2023 technical correction notice, the EPA revised § 262.16(b)(1) to clarify that the acute hazardous waste accumulation limit for a small quantity generator is one kilogram.

The EPA received an adverse comment on this provision. One commenter stated that a 1-kilogram limit for small quantity generators accumulating acute hazardous waste would create severe logistical issues for facilities that generate just slightly under 1 kilogram per month of acutely hazardous waste as the proposed rule will essentially make their allowable accumulation time 30 days. The commenter stated that it would be ''impossible to collect samples, characterize the waste, receive disposal approval for the waste and have the waste transported offsite within the allowable time frame.''

EPA disagrees with the comment. As described in this preamble, a 1-kilogram accumulation limit for this category of generator was part of the RCRA regulations starting in 1980 and the revision being made is to make that clearer in the regulations. The generator regulations are designed so that if a generator needs additional time to sample, characterize, and arrange for disposal of an acute hazardous waste that is accumulating on site, it can operate under the requirements for a large quantity generator instead of those of a small quantity generator and remain in compliance with the generator regulations. The additional large quantity generator standards ensure the safe handling of the elevated amounts of acute hazardous waste being accumulated at the generator site.

EPA is finalizing this provision as described in the August 9, 2023, notice.

C. Section 262.17(a)(8)(i) Introductory Text and (a)(8)(i)(A)

The 2016 Hazardous Waste Generator Improvements Rule added a requirement that LQGs undergoing closure of a hazardous waste unit submit a notification that they are closing that unit, including information on the timing of the closure. The generators have two options for submitting that notification when a specific waste accumulation unit is closing, but the generator as a whole is not closing all its units on site (*i.e.,* it will continue generating and accumulating hazardous waste on site). The 2023 direct final rule revised the language in § 262.17(a)(8)(i) and (a)(8)(i)(A) to more clearly describe when the provisions apply and used the defined term ''final closure.'' The preamble to the 2023 direct final rule explained that EPA made these changes to distinguish between the requirements that apply when a unit is closing and those that apply when the whole facility is closing.

EPA received an adverse comment on this revision from a State that implements hazardous waste regulations. The commenter argued that a reference to the defined term ''final closure'' in this introductory text is not appropriate and suggested that EPA instead use the phrase ''undergoing closure of the facility.'' The commenter argues that this would be more appropriate for a generator closing a waste unit and needing to follow this requirement.

The commenter also submitted comments on a suggested revision to § 262.17(a)(8)(i)(A), stating that this part of the closure regulations would be clearer if the last statement in § 262.17(a)(8)(i)(B) about when a generator can remove a closure notice from its operating record because a waste accumulation unit was reopened was moved from § 262.17(a)(8)(i)(B) to § 262.17(a)(8)(i)(A).

EPA agrees that using the term ''final closure'' in this paragraph adds unnecessary confusion and that the sentence the commenter identified would make more sense in the revised § 262.17(a)(8)(i)(A). EPA is finalizing revisions to this section to make those changes and to state that the regulations apply when closing a waste accumulation unit but not all waste accumulation units.

D. Section 266.508(a)(2)(ii)

The preamble to the 2023 direct final rule explained that EPA was amending § 266.508(a)(2)(ii) in two ways. First, EPA allowed the four-character PHRM code as well as the existing six-character PHARMS code in Item 13 when manifesting non-creditable hazardous waste pharmaceuticals to a TSDF. This was consistent with guidance EPA issued in 2019.[1] Second, EPA inserted a sentence at the end clarifying that a healthcare facility may choose to include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22, in addition to the PHARMS or PHRM code that was already required. This was consistent with preamble from the Hazardous Waste Pharmaceuticals final rule.[2]

EPA received one adverse comment on the second provision. The

[1] From Johnson to EPA Regions, December 19, 2019, RCRA Online #14919.

[2] 84 FR 5877; February 22, 2019.

commenter was a State that expressed concerns that the rule does not resolve the issue that the inclusion of RCRA codes with PHRM/PHARMS on a manifest seems to negate any benefits for a healthcare facility operating under Subpart P. The State was concerned that a healthcare facility would be charged a higher fee by those States which collect fees. The State noted that including PHRM or PHARMS along with RCRA hazardous waste codes creates confusion and that it is unclear why the RCRA codes are being listed.

EPA disagrees with the commenter and is finalizing the provision as proposed. First, with respect to the PHRM code, while we did not receive any comments on this specific aspect of the proposed amendment, the adverse comment on other portions of the same paragraph meant that this was withdrawn, as well. This final rule allows healthcare facilities to use the PHRM or PHARMS code in Item 13 when manifesting non-creditable hazardous waste pharmaceuticals.

Second, with respect to hazardous waste codes, this final rule allows healthcare facilities to include hazardous waste codes in addition to the PHRM/PHARMS code when manifesting non-creditable hazardous waste pharmaceuticals. As discussed in a Frequent Question that is posted to our website,[3] as well as in a memorandum,[4] there are certain situations where the hazardous waste codes need to be included when manifesting non-creditable hazardous waste pharmaceuticals. For example, in States that have not yet adopted part 266 subpart P, healthcare facilities are subject to the standard 40 CFR part 262 generator regulations for their hazardous waste pharmaceuticals, which require healthcare facilities to include all applicable waste codes on the manifest. Therefore, if a healthcare facility that is operating under part 266 subpart P ships non-creditable hazardous waste pharmaceuticals to a TSDF that is in a State that has not yet adopted part 266 subpart P, the healthcare facility would need to include the hazardous waste codes to satisfy the regulatory requirements in the receiving State. Additionally, some vendors may require their healthcare facility customers to include the hazardous waste codes and EPA does not want to preclude that practice because including all applicable hazardous waste codes could help receiving facilities better understand the wastes and determine the best course of management including, for example, complying with the land disposal restriction treatment standards.

Finally, waste industry representatives have told EPA that their practice is to not commingle hazardous waste pharmaceuticals in the same container with non-pharmaceutical hazardous wastes.[5] This means that when hazardous waste codes are included on the same line of the manifest as the PHRM/PHARMS code, the hazardous waste codes can be presumed to be referring to hazardous waste pharmaceuticals, and not to other, non-pharmaceutical hazardous wastes.

For these reasons, EPA is finalizing regulatory language that allows a healthcare facility to include the hazardous waste codes in Item 13 of the manifest, in addition to the PHRM/PHARMS code.

V. State Authorization

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, the EPA may authorize a qualified State to administer its own hazardous waste program within the State in lieu of the Federal program. Following authorization, the EPA retains enforcement authority under sections 3008, 3013, and 7003 of RCRA, although authorized States have primary enforcement responsibility. The standards and requirements for State authorization are found at 40 CFR part 271.

Prior to enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final RCRA authorization administered its hazardous waste program entirely in lieu of the EPA administering the Federal program in that State. The Federal requirements no longer applied in the authorized State, and the EPA could not issue permits for any facilities in that State, since only the State was authorized to issue RCRA permits. When new, more stringent Federal requirements were promulgated, the State was obligated to enact equivalent authorities within specified time frames. However, the new Federal requirements did not take effect in an authorized State until the State adopted the Federal requirements as State law.

In contrast, under RCRA section 3006(g) (42 U.S.C. 6926(g)), which was added by HSWA, new requirements and prohibitions imposed under HSWA authority take effect in authorized States at the same time that they take effect in unauthorized States. The EPA is directed by the statute to implement these requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA related provisions as State law to retain final authorization, the EPA implements the HSWA provisions in authorized States until the States do so.

Authorized States are required to modify their program only when the EPA enacts Federal requirements that are more stringent or broader in scope than the existing Federal requirements. RCRA section 3009 allows the States to impose standards more stringent than those in the Federal program (see also 40 CFR 271.1). Therefore, authorized States may, but are not required to, adopt Federal regulations, both HSWA and non-HSWA, that are considered less stringent than or equally as stringent as the previous Federal regulations.

B. Effect on State Authorization

This final rule finalizes technical corrections to regulations in 40 CFR parts 261, 262, and 266 that are being promulgated in part under the authority of HSWA, and in part under non-HSWA authority. Thus, the technical corrections and clarifications finalized in this direct final rule that are under non-HSWA authority would be applicable on the effective date only in those States that do not have final authorization of their base RCRA programs. However, the technical corrections to regulations in § 262.16(b)(1) are promulgated under the authority of HSWA and would be effective on the effective date of this final rule in all States.

This final rule is considered to be neither more nor less stringent than the current standards. Therefore, because of section 3009 of RCRA, which allows States to impose more stringent regulations than the Federal program, as described in section V.a. of this preamble, authorized States would not be required to modify their programs to adopt the technical corrections promulgated in this final rule, although we would strongly urge the States to adopt these technical corrections to avoid any confusion or misunderstanding by the regulated community and the public.

[3] *https://www.epa.gov/hwgenerators/frequent-questions-about-management-standards-hazardous-waste-pharmaceuticals-and#e2.*

[4] From Johnson to EPA Regions, December 19, 2019, RCRA Online #14919.

[5] Per personal communication with Charlotte Smith of Waste Management, January 26, 2022, and email communication with Mike Crisenbery of Clean Harbors, February 10, 2022.

VI. 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 14094: Modernizing Regulatory Review

This action is not a significant regulatory action as defined in Executive Order 12866, as amended by Executive Order 14094, and was therefore not subject to a requirement for Executive Order 12866 review.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA because it does not contain any information collection activities. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control numbers 2050–0213, 2050–0202, and 2050–0212.

C. 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 simply corrects typographical errors, incorrect citations, and omissions; provides clarifications; and makes conforming changes where they have not been made previously. We have therefore concluded that this action will have no regulatory burden for all directly regulated small entities.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million (adjusted annually for inflation) or more (in 1995 dollars) 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.

E. 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.

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

This action does not have tribal implications as specified in Executive Order 13175. Because the rule does not make any substantive change, it will not impose substantial direct costs on Tribal governments. Thus, Executive Order 13175 does not apply to this action.

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

EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definition of ''covered regulatory action'' in section 2–202 of the Executive Order.

Therefore, this action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk. Since this action does not concern human health, EPA's Policy on Children's Health also does not apply.

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

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

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

The EPA believes that these technical corrections do not concern human health or environmental conditions and therefore cannot be evaluated with respect to potentially disproportionate and adverse effects on people of color, low-income populations and/or indigenous peoples because this final rule does not create any new regulatory requirements, but rather clarifies existing requirements and makes conforming changes.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 261

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Hazardous waste, Intergovernmental relations, Licensing and registration, Reporting and recordkeeping requirements.

40 FR Part 262

Environmental protection, Exports, Hazardous materials transportation, Hazardous waste, Imports, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

40 FR Part 266

Environmental protection, Energy, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

For the reasons set forth in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

■ 1. The authority for part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y) and 6938.

■ 2. Section 261.4 is amended by revising (e)(1) introductory text to read as follows:

§ 261.4 Exclusions.

(e) * * *

(1) Except as provided in paragraphs (e)(2) and (4) of this section, persons who generate or collect samples for the purpose of conducting treatability studies as defined in 40 CFR 260.10, are not subject to any requirement of this part, 40 CFR parts 262 and 263, or to the notification requirements of Section 3010 of RCRA, nor are such samples included in the quantity determinations of 40 CFR 262.13 and the accumulation limits in 40 CFR 262.14(a)(3), 40 CFR 262.14(a)(4), and 40 CFR 262.16(b)(1) when:

* * * * *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

■ 3. The authority for part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922–6925, 6937, 6938 and 6939g.

■ 4. Section 262.16 is amended by revising paragraph (b)(1) to read as follows:

§ 262.16 Conditions for exemption for a small quantity generator that accumulates hazardous waste.

(b) * * *

(1) *Accumulation limit.* The quantity of acute hazardous waste accumulated on site never exceeds 1 kilogram (2.2 pounds) and the quantity of non-acute hazardous waste accumulated on site never exceeds 6,000 kilograms (13,200 pounds);

* * * * *

■ 5. Section 262.17 is amended by revising (a)(8)(i) to read as follows:

§ 262.17 Conditions for exemption for a large quantity generator that accumulates hazardous waste.

(a) * * *

(8) * * *

(i) *Notification for closure of a waste accumulation unit.* A large quantity generator must perform one of the following when closing a waste accumulation unit, but not all waste accumulation units:

(A) Place a notice in the operating record within 30 days after closure identifying the location of the unit within the facility (if the waste accumulation unit is subsequently reopened, the generator may remove the notice from the operating record); or

(B) Meet the closure performance standards of paragraph (a)(8)(iii) of this section for container, tank, and containment building waste accumulation units or paragraph (a)(8)(iv) of this section for drip pads and notify EPA following the procedures in paragraph (a)(8)(ii)(B) of this section for the waste accumulation unit.

* * * * *

PART 266—STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES

■ 6. The authority for part 266 continues to read as follows:

Authority: 42 U.S.C. 1006, 2002(a), 3001–3009, 3014, 3017, 6905, 6906, 6912, 6921, 6922, 6924–6927, 6934, and 6937.

■ 7. Section 266.508 is amended by revising paragraph (a)(2)(ii) to read as follows:

§ 266.508 Shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility or evaluated hazardous waste pharmaceuticals from a reverse distributor.

(a) * * *

(2) * * *

(ii) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals must write the word "PHRM" or "PHARMS" in Item 13 of EPA Form 8700–22. A healthcare facility may also include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22.

* * * * *

[FR Doc. 2024–28802 Filed 12–10–24; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2023–0021]

RIN 2127–AM37

Federal Motor Vehicle Safety Standards; Automatic Emergency Braking Systems for Light Vehicles; Correction

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Final rule; response to petitions for reconsideration; correction.

SUMMARY: This document corrects a November 26, 2024 final rule partially granting petitions for reconsideration of a May 9, 2024, final rule that adopted Federal Motor Vehicle Safety Standard (FMVSS) No. 127, "Automatic Emergency Braking for Light Vehicles," which requires automatic emergency braking (AEB), pedestrian automatic emergency braking (PAEB), and forward collision warning (FCW) systems on all new light vehicles. This document corrects a typographical error in the amendatory instructions.

DATES: Effective January 27, 2025.

ADDRESSES: Correspondence related to this rule should refer to the docket number set forth above (NHTSA–2023–0021) and be submitted to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: For technical issues: Mr. Markus Price, Office of Crash Avoidance Standards, Telephone: (202) 366–1810, Facsimile: (202) 366–7002. For legal issues: Mr. Eli Wachtel, Office of the Chief Counsel, Telephone: (202) 366–2992, Facsimile: (202) 366–3820. The mailing address for these officials is: National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590.

SUPPLEMENTARY INFORMATION: In FR Doc. 2024–27349 appearing on page 93199 in the **Federal Register** of Tuesday, November 26, 2024, the following correction is made:

§ 571.127 [Corrected]

■ On page 93220, in the first column, in part 571, in amendment 2.b, the instruction "Revising S5.1.1(a)(3) and (4), S5.1.1(b)(2), S5.1.3, and S8.3.3(g)." is corrected to read "Revising S5.1.1(a)(3) and (4), S5.1.1(b)(1), S5.1.3, and S8.3.3(g).".

Issued in Washington, DC, under authority delegated in 49 CFR 1.95 and 501.8.

Raymond R. Posten,

Associate Administrator, Rulemaking.

[FR Doc. 2024–28998 Filed 12–10–24; 8:45 am]

BILLING CODE P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 29

[Docket No. FWS–HQ–NWRS–2019–0017; FF09R50000–XXX–FVRS3451900000]

RIN 1018–BD78

Permitting of Rights-of-Way Across National Wildlife Refuges and Other U.S. Fish and Wildlife Service-Administered Lands

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are revising our process for permitting of rights-of-way across National Wildlife Refuge System lands and other Service-administered lands. By aligning Service processes more closely with those of other Department of the Interior bureaus, to the extent practicable and consistent with applicable law, we will reduce the amount of time the Service requires to process applications for rights-of-way across Service-managed lands. We will require a preapplication meeting and use of a standard application, allow electronic submission of applications, and provide the Service with additional flexibility, as appropriate, to determine the fair market value or fair market rental value of rights-of-way across Service-managed lands. Additionally, we are implementing new permit terms and conditions and other regulatory changes.

DATES: This rule is effective January 10, 2025.

REFRIGERATION AND AIR CONDITIONING—Continued

End-use	Substitute	Decision	Further information [1]
Retail food refrigeration—Remote condensing units *(retrofit equipment only).*	R–471A	Acceptable	This substitute is a blend of 78.7 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene; (CAS Reg. No. 29118–24–9); 17.0 percent HFO–1336mzz(E), also known as *trans*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 66711–86–2); and 4.3 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–471A has a GWP of 144 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1". ASHRAE has established an OEL for the blend of 710 ppm (8-hr TWA). For the components of R–471A, OARS has established a WEEL of 400 ppm on an 8-hr TWA for HFO–1336mzz(E), AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).
Retail food refrigeration—Supermarket systems *(retrofit equipment only).*	R–471A	Acceptable	This substitute is a blend of 78.7 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene; (CAS Reg. No. 29118–24–9); 17.0 percent HFO–1336mzz(E), also known as *trans*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 66711–86–2); and 4.3 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–471A has a GWP of 144 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1". ASHRAE has established an OEL for the blend of 710 ppm (8-hr TWA). For the components of R–471A, OARS has established a WEEL of 400 ppm on an 8-hr TWA for HFO–1336mzz(E), AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).
Water coolers *(retrofit equipment only).*	R–480A	Acceptable	This substitute is a weighted blend of 5 percent CO_2, 86 percent HFO–1234ze(E), which is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene CAS Reg. No. 29118–24–9), and 9 percent HFC–227ea, which is also known as 1,1,1,2,3,3,3-heptafluoropropane (CAS Reg. No. 431–89–0). R–480A has a GWP of 291 and an ODP of 0. The blend is not flammable as it has an ASHRAE flammability classification of "1." ASHRAE has adopted an OEL for the blend of 900 ppm (8-hr TWA). For the components of R–480A, OSHA has established a PEL for CO_2 of 5,000 ppm on an 8-hr TWA, AIHA has established a WEEL of 1,000 ppm for HFC–227ea (8-hr TWA), and ASHRAE has adopted an OEL of 800 ppm on an 8-hr TWA for HFO–1234ze(E).

[1] See recommendations in the manufacturer's SDS and guidance for all listed refrigerants.

FOAM BLOWING

End-use	Substitute	Decision	Further information [1]
Polystyrene: Extruded boardstock and billet.	Extruded polystyrene (XPS) foam blowing agent blends of 0 to 90 percent HFO–1336mzz(Z), 0 to 90 percent HFO–1234ze(E), 0 to 75 percent HFC–152a, and 0 to 90 percent CO_2.	Acceptable	HFO–1234ze(E) is also known as *trans*-1,3,3,3-tetrafluoroprop-1-ene (Chemical Abstracts Service Registry Number [CAS Reg. No.] 29118–24–9). HFO–1336mzz(Z) is also known as (Z)-1,1,1,4,4,4-hexafluoro-2-butene and *cis*-1,1,1,4,4,4-hexafluoro-2-butene (CAS Reg. No. 692–49–9). HFC–152a is also known as 1,1-difluoroethane (CAS Reg. No. 75–37–6). CO_2 has CAS Reg. No. 124–38–9. These blends have 100-year GWPs from 1 to about 94, depending on the specific composition. Blends of these compounds anticipated to be used in manufacturing are flammable. The AIHA has established a WEEL of 1,000 ppm for HFC–152a on an eight-hour Time-Weighted Average (8-hr TWA). The OARS has established a WEEL of 500 ppm (8-hr TWA) for HFO–1336mzz(Z). The manufacturer of HFO–1234ze(E) has established an OEL of 800 ppm (8-hr TWA) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers has adopted an OEL of 800 ppm (8-hr TWA) for this compound. The U.S. OSHA has established a PEL of 5,000 ppm on an 8-hr TWA for CO_2.

[1] See recommendations in the manufacturer's SDS and guidance for all listed foam blowing agents.

[FR Doc. 2024–28307 Filed 12–10–24; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 261, 262, and 266

[EPA–HQ–OLEM–2023–0081; FRL 8687–04–OLEM]

RIN 2050–AH23

Hazardous Waste Generator Improvements Rule, the Hazardous Waste Pharmaceuticals Rule, and the Definition of Solid Waste Rule; Technical Corrections

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or the Agency) is finalizing five amendments that were withdrawn in its December 6, 2023, partial withdrawal of direct final rule. Due to receipt of adverse comments, the EPA withdrew eight amendments from the August 9, 2023, direct final rule that included revisions to the 2016 Hazardous Waste Generator Improvements Rule, the 2019 Hazardous Waste Pharmaceuticals Rule and the 2018 Vacatur of the Definition of Solid Waste Rule (88 FR 54086). The EPA is

responding to the relevant adverse comments in this action.

DATES: This final rule is effective on February 10, 2025.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2023–0081. All documents in the docket are listed on the *http://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI 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 form. Publicly available docket materials are available electronically through *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Kathy Lett, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0517, (*lett.kathy@epa.gov*) or Kristin Fitzgerald, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery (MC: 5304T), 1200 Pennsylvania Avenue NW, Washington, DC 20460, (202) 566–0512 (*fitzgerald.kristin@epa.gov*).

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

Entities potentially affected by this action include hazardous waste generators, treatment, storage, and disposal facilities, healthcare facilities, reverse distributors, importers/exporters of hazardous waste, and users of the transfer-based exclusion to the definition of solid waste. Also affected are States and EPA Regions implementing these RCRA hazardous waste regulations.

This discussion is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This discussion includes the types of entities that the EPA is now aware could potentially be regulated by this action. Other types of entities not included could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in Section IV of the preamble. If you have questions regarding the applicability of this action to a particular entity, consult the persons listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the agency taking?

This action finalizes five amendments that were included in its August 9, 2023, direct final rule that made technical corrections to three rulemakings related to the generation of hazardous waste: the 2016 Hazardous Waste Generator Improvements Rule, the 2019 Hazardous Waste Pharmaceuticals Rule, and the 2018 Vacatur of the Definition of Solid Waste Rule (88 FR 54086). Due to receipt of adverse comments, eight amendments were withdrawn in the EPA's December 6, 2023, partial withdrawal of direct final rule (88 FR 84710). EPA has evaluated the comments received on the amendments and is finalizing five of these amendments, found in §§ 261.4(e)(1), 262.16(b)(1), 262.17(a)(8)(i) introductory text, 262.17(a)(8)(i)(A) and 266.508(a)(2)(ii). These five provisions relate to the 2016 Hazardous Waste Generator Improvements Rule and the 2019 Hazardous Waste Pharmaceuticals Rule.

Finalizing these technical corrections will correct or clarify the regulations for generators and handlers of hazardous waste. The EPA is also responding in this preamble to the adverse comments on the items that we are finalizing in this action. The three provisions we are not finalizing will not go into effect with this action and the EPA is not responding to the adverse comments on these three provisions.

C. What is the agency's authority for taking this action?

This rule is authorized under sections 1004, 2002, 3001, 3002, 3003, 3004, 3005, 3006, and 3010, of the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6903, 6912, 6921, 6922, 6923, 6924, 6925, 6926, and 6930.

III. Background

In the EPA's August 9, 2023, direct final rule (88 FR 54086), EPA explained that the Agency views the minor fixes and clarifications included in the action as noncontroversial. However, EPA published a parallel proposed rule the same day that could serve as the proposed rule to adopt the provisions in the direct final rule if adverse comments were received. EPA stated that in this case, there would not be a second comment period on this action.

The direct final rule preamble also stated that if the Agency were to receive adverse comment on any individual correction, we would publish a timely withdrawal in the **Federal Register** informing the public about the specific regulatory paragraph or amendment that will not take effect.

The EPA received adverse comments on eight amendments from the direct final rule and withdrew them on December 6, 2023 (88 FR 84710). All corrections that were not withdrawn became effective on December 7, 2023.

IV. Provisions Being Finalized and Response to Comment

A. Section 261.4(e)(1)

The August 9, 2023, direct final rule identified a number of regulatory citations that were incorrect and outdated in the regulations for generators of hazardous waste and updated those citations. Section 261.4(e) provides requirements for management of samples used in treatability studies and included citations that needed to be updated. The list of corrections included revising § 261.4(e)(1) to replace the references to quantity determinations in §§ 261.5 and 262.34(d) with a reference to the counting requirements in § 262.13 and the accumulation limits in § 262.16(b)(1).

EPA received an adverse comment to this revision. The commenter stated that it appears that the revised citation in this location, which identifies which categories of generators do not need to count treatability sample weight towards generator accumulation limits was incomplete. The comment stated that the revised citation should point to the accumulation limits for very small quantity generators (VSQGs), large quantity generators (LQGs), and satellite accumulation areas (SAAs), not just SQGs.

EPA partially agrees with the commenter and is revising this citation to include references to §§ 262.14(a)(3) and (4), the accumulation limits for VSQGs accumulating acute and non-acute hazardous waste. The original language in this section referred to accumulation limits for VSQGs and SQGs and this revision reestablishes those two references. Generators accumulating waste at SAAs must include that waste in their monthly quantities for determining generator status, but the original regulatory language did not refer to the SAA requirements and LQGs do not have an accumulation limit. For these reasons, EPA is not amending the language to add any references to SAA or LQG requirements.

B. Section 262.16(b)(1)

The 2016 Generator Improvements rule established definitions for very small, small, and large quantity generators, reorganized the regulations for these categories of generators, and

clearly distinguished the generator categories—determined by how much hazardous waste is generated per calendar month at a site—from the conditions for exemption that specify limits for how much hazardous waste small and very small quantity generators can accumulate on site at any one time.

However, the small quantity generator conditions for exemption include an on-site accumulation limit of 6,000 kilograms for non-acute hazardous waste but do not specify an on-site accumulation limit for acute hazardous waste.

In the original 1980 hazardous waste generator regulations, there were only two categories of hazardous waste generator: small (generating less than 1,000 kilograms of hazardous waste per month) and large (generating more than 1,000 kilograms of hazardous waste per month). These pre-1986 small quantity generators had a total on-site hazardous waste accumulation limit of 6,000 kilograms of non-acute hazardous waste and one kilogram of acute hazardous waste. The 1986 rule that established the category and specific requirements for those generating between 100 kilograms and 1,000 kilograms per month (small quantity generators) (51 FR 10146; March 24, 1986) implemented the changes to the hazardous waste program required by the Hazardous and Solid Waste Amendments of 1984 (HSWA) and established a new category of ''conditionally exempt small quantity generator'' for those generating less than 100 kilograms of non-acute hazardous waste per month.

The scope of HSWA and the new regulations for conditionally exempt small quantity generators did not include acute hazardous waste. Therefore, generators generating less than one kilogram of acute hazardous waste per month are conditionally exempt small quantity generators and those generating more than one kilogram of acute hazardous waste per month are large quantity generators. There is no separate small quantity generator category based solely on generation of acute hazardous waste.

The EPA clarified the distinctions between the three generator categories in the 2016 Generator Improvements rule and stated that a small quantity generator can only generate up to one kilogram of acute hazardous waste in a calendar month, but it was not clear in the new language whether there is a limit on the amount of acute hazardous waste a small quantity generator can accumulate on site at any one time. Consistent with what has been historically allowed for generators of small amounts of acute hazardous waste since the 1980 regulations, in the August 2023 technical correction notice, the EPA revised § 262.16(b)(1) to clarify that the acute hazardous waste accumulation limit for a small quantity generator is one kilogram.

The EPA received an adverse comment on this provision. One commenter stated that a 1-kilogram limit for small quantity generators accumulating acute hazardous waste would create severe logistical issues for facilities that generate just slightly under 1 kilogram per month of acutely hazardous waste as the proposed rule will essentially make their allowable accumulation time 30 days. The commenter stated that it would be ''impossible to collect samples, characterize the waste, receive disposal approval for the waste and have the waste transported offsite within the allowable time frame.''

EPA disagrees with the comment. As described in this preamble, a 1-kilogram accumulation limit for this category of generator was part of the RCRA regulations starting in 1980 and the revision being made is to make that clearer in the regulations. The generator regulations are designed so that if a generator needs additional time to sample, characterize, and arrange for disposal of an acute hazardous waste that is accumulating on site, it can operate under the requirements for a large quantity generator instead of those of a small quantity generator and remain in compliance with the generator regulations. The additional large quantity generator standards ensure the safe handling of the elevated amounts of acute hazardous waste being accumulated at the generator site.

EPA is finalizing this provision as described in the August 9, 2023, notice.

C. Section 262.17(a)(8)(i) Introductory Text and (a)(8)(i)(A)

The 2016 Hazardous Waste Generator Improvements Rule added a requirement that LQGs undergoing closure of a hazardous waste unit submit a notification that they are closing that unit, including information on the timing of the closure. The generators have two options for submitting that notification when a specific waste accumulation unit is closing, but the generator as a whole is not closing all its units on site (*i.e.,* it will continue generating and accumulating hazardous waste on site). The 2023 direct final rule revised the language in § 262.17(a)(8)(i) and (a)(8)(i)(A) to more clearly describe when the provisions apply and used the defined term ''final closure.'' The preamble to the 2023 direct final rule explained that EPA made these changes to distinguish between the requirements that apply when a unit is closing and those that apply when the whole facility is closing.

EPA received an adverse comment on this revision from a State that implements hazardous waste regulations. The commenter argued that a reference to the defined term ''final closure'' in this introductory text is not appropriate and suggested that EPA instead use the phrase ''undergoing closure of the facility.'' The commenter argues that this would be more appropriate for a generator closing a waste unit and needing to follow this requirement.

The commenter also submitted comments on a suggested revision to § 262.17(a)(8)(i)(A), stating that this part of the closure regulations would be clearer if the last statement in § 262.17(a)(8)(i)(B) about when a generator can remove a closure notice from its operating record because a waste accumulation unit was reopened was moved from § 262.17(a)(8)(i)(B) to § 262.17(a)(8)(i)(A).

EPA agrees that using the term ''final closure'' in this paragraph adds unnecessary confusion and that the sentence the commenter identified would make more sense in the revised § 262.17(a)(8)(i)(A). EPA is finalizing revisions to this section to make those changes and to state that the regulations apply when closing a waste accumulation unit but not all waste accumulation units.

D. Section 266.508(a)(2)(ii)

The preamble to the 2023 direct final rule explained that EPA was amending § 266.508(a)(2)(ii) in two ways. First, EPA allowed the four-character PHRM code as well as the existing six-character PHARMS code in Item 13 when manifesting non-creditable hazardous waste pharmaceuticals to a TSDF. This was consistent with guidance EPA issued in 2019.[1] Second, EPA inserted a sentence at the end clarifying that a healthcare facility may choose to include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22, in addition to the PHARMS or PHRM code that was already required. This was consistent with preamble from the Hazardous Waste Pharmaceuticals final rule.[2]

EPA received one adverse comment on the second provision. The

[1] From Johnson to EPA Regions, December 19, 2019, RCRA Online #14919.

[2] 84 FR 5877; February 22, 2019.

commenter was a State that expressed concerns that the rule does not resolve the issue that the inclusion of RCRA codes with PHRM/PHARMS on a manifest seems to negate any benefits for a healthcare facility operating under Subpart P. The State was concerned that a healthcare facility would be charged a higher fee by those States which collect fees. The State noted that including PHRM or PHARMS along with RCRA hazardous waste codes creates confusion and that it is unclear why the RCRA codes are being listed.

EPA disagrees with the commenter and is finalizing the provision as proposed. First, with respect to the PHRM code, while we did not receive any comments on this specific aspect of the proposed amendment, the adverse comment on other portions of the same paragraph meant that this was withdrawn, as well. This final rule allows healthcare facilities to use the PHRM or PHARMS code in Item 13 when manifesting non-creditable hazardous waste pharmaceuticals.

Second, with respect to hazardous waste codes, this final rule allows healthcare facilities to include hazardous waste codes in addition to the PHRM/PHARMS code when manifesting non-creditable hazardous waste pharmaceuticals. As discussed in a Frequent Question that is posted to our website,[3] as well as in a memorandum,[4] there are certain situations where the hazardous waste codes need to be included when manifesting non-creditable hazardous waste pharmaceuticals. For example, in States that have not yet adopted part 266 subpart P, healthcare facilities are subject to the standard 40 CFR part 262 generator regulations for their hazardous waste pharmaceuticals, which require healthcare facilities to include all applicable waste codes on the manifest. Therefore, if a healthcare facility that is operating under part 266 subpart P ships non-creditable hazardous waste pharmaceuticals to a TSDF that is in a State that has not yet adopted part 266 subpart P, the healthcare facility would need to include the hazardous waste codes to satisfy the regulatory requirements in the receiving State. Additionally, some vendors may require their healthcare facility customers to include the hazardous waste codes and EPA does not want to preclude that practice because including all applicable hazardous waste codes could help receiving facilities better understand the wastes and determine the best course of management including, for example, complying with the land disposal restriction treatment standards.

Finally, waste industry representatives have told EPA that their practice is to not commingle hazardous waste pharmaceuticals in the same container with non-pharmaceutical hazardous wastes.[5] This means that when hazardous waste codes are included on the same line of the manifest as the PHRM/PHARMS code, the hazardous waste codes can be presumed to be referring to hazardous waste pharmaceuticals, and not to other, non-pharmaceutical hazardous wastes.

For these reasons, EPA is finalizing regulatory language that allows a healthcare facility to include the hazardous waste codes in Item 13 of the manifest, in addition to the PHRM/PHARMS code.

V. State Authorization

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, the EPA may authorize a qualified State to administer its own hazardous waste program within the State in lieu of the Federal program. Following authorization, the EPA retains enforcement authority under sections 3008, 3013, and 7003 of RCRA, although authorized States have primary enforcement responsibility. The standards and requirements for State authorization are found at 40 CFR part 271.

Prior to enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final RCRA authorization administered its hazardous waste program entirely in lieu of the EPA administering the Federal program in that State. The Federal requirements no longer applied in the authorized State, and the EPA could not issue permits for any facilities in that State, since only the State was authorized to issue RCRA permits. When new, more stringent Federal requirements were promulgated, the State was obligated to enact equivalent authorities within specified time frames. However, the new Federal requirements did not take effect in an authorized State until the State adopted the Federal requirements as State law.

In contrast, under RCRA section 3006(g) (42 U.S.C. 6926(g)), which was added by HSWA, new requirements and prohibitions imposed under HSWA authority take effect in authorized States at the same time that they take effect in unauthorized States. The EPA is directed by the statute to implement these requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA related provisions as State law to retain final authorization, the EPA implements the HSWA provisions in authorized States until the States do so.

Authorized States are required to modify their program only when the EPA enacts Federal requirements that are more stringent or broader in scope than the existing Federal requirements. RCRA section 3009 allows the States to impose standards more stringent than those in the Federal program (see also 40 CFR 271.1). Therefore, authorized States may, but are not required to, adopt Federal regulations, both HSWA and non-HSWA, that are considered less stringent than or equally as stringent as the previous Federal regulations.

B. Effect on State Authorization

This final rule finalizes technical corrections to regulations in 40 CFR parts 261, 262, and 266 that are being promulgated in part under the authority of HSWA, and in part under non-HSWA authority. Thus, the technical corrections and clarifications finalized in this direct final rule that are under non-HSWA authority would be applicable on the effective date only in those States that do not have final authorization of their base RCRA programs. However, the technical corrections to regulations in § 262.16(b)(1) are promulgated under the authority of HSWA and would be effective on the effective date of this final rule in all States.

This final rule is considered to be neither more nor less stringent than the current standards. Therefore, because of section 3009 of RCRA, which allows States to impose more stringent regulations than the Federal program, as described in section V.a. of this preamble, authorized States would not be required to modify their programs to adopt the technical corrections promulgated in this final rule, although we would strongly urge the States to adopt these technical corrections to avoid any confusion or misunderstanding by the regulated community and the public.

[3] *https://www.epa.gov/hwgenerators/frequent-questions-about-management-standards-hazardous-waste-pharmaceuticals-and#e2.*

[4] From Johnson to EPA Regions, December 19, 2019, RCRA Online #14919.

[5] Per personal communication with Charlotte Smith of Waste Management, January 26, 2022, and email communication with Mike Crisenbery of Clean Harbors, February 10, 2022.

VI. 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 14094: Modernizing Regulatory Review

This action is not a significant regulatory action as defined in Executive Order 12866, as amended by Executive Order 14094, and was therefore not subject to a requirement for Executive Order 12866 review.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA because it does not contain any information collection activities. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control numbers 2050–0213, 2050–0202, and 2050–0212.

C. 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 simply corrects typographical errors, incorrect citations, and omissions; provides clarifications; and makes conforming changes where they have not been made previously. We have therefore concluded that this action will have no regulatory burden for all directly regulated small entities.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million (adjusted annually for inflation) or more (in 1995 dollars) 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.

E. 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.

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

This action does not have tribal implications as specified in Executive Order 13175. Because the rule does not make any substantive change, it will not impose substantial direct costs on Tribal governments. Thus, Executive Order 13175 does not apply to this action.

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

EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definition of ''covered regulatory action'' in section 2–202 of the Executive Order.

Therefore, this action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk. Since this action does not concern human health, EPA's Policy on Children's Health also does not apply.

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

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

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

The EPA believes that these technical corrections do not concern human health or environmental conditions and therefore cannot be evaluated with respect to potentially disproportionate and adverse effects on people of color, low-income populations and/or indigenous peoples because this final rule does not create any new regulatory requirements, but rather clarifies existing requirements and makes conforming changes.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 261

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Hazardous waste, Intergovernmental relations, Licensing and registration, Reporting and recordkeeping requirements.

40 FR Part 262

Environmental protection, Exports, Hazardous materials transportation, Hazardous waste, Imports, Labeling, Packaging and containers, Reporting and recordkeeping requirements.

40 FR Part 266

Environmental protection, Energy, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

For the reasons set forth in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

■ 1. The authority for part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y) and 6938.

■ 2. Section 261.4 is amended by revising (e)(1) introductory text to read as follows:

§ 261.4 Exclusions.

(e) * * *

(1) Except as provided in paragraphs (e)(2) and (4) of this section, persons who generate or collect samples for the purpose of conducting treatability studies as defined in 40 CFR 260.10, are not subject to any requirement of this part, 40 CFR parts 262 and 263, or to the notification requirements of Section 3010 of RCRA, nor are such samples included in the quantity determinations of 40 CFR 262.13 and the accumulation limits in 40 CFR 262.14(a)(3), 40 CFR 262.14(a)(4), and 40 CFR 262.16(b)(1) when:

* * * * *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

■ 3. The authority for part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922–6925, 6937, 6938 and 6939g.

■ 4. Section 262.16 is amended by revising paragraph (b)(1) to read as follows:

§ 262.16 Conditions for exemption for a small quantity generator that accumulates hazardous waste.

(b) * * *

(1) *Accumulation limit.* The quantity of acute hazardous waste accumulated on site never exceeds 1 kilogram (2.2 pounds) and the quantity of non-acute hazardous waste accumulated on site never exceeds 6,000 kilograms (13,200 pounds);

* * * * *

■ 5. Section 262.17 is amended by revising (a)(8)(i) to read as follows:

§ 262.17 Conditions for exemption for a large quantity generator that accumulates hazardous waste.

(a) * * *

(8) * * *

(i) *Notification for closure of a waste accumulation unit.* A large quantity generator must perform one of the following when closing a waste accumulation unit, but not all waste accumulation units:

(A) Place a notice in the operating record within 30 days after closure identifying the location of the unit within the facility (if the waste accumulation unit is subsequently reopened, the generator may remove the notice from the operating record); or

(B) Meet the closure performance standards of paragraph (a)(8)(iii) of this section for container, tank, and containment building waste accumulation units or paragraph (a)(8)(iv) of this section for drip pads and notify EPA following the procedures in paragraph (a)(8)(ii)(B) of this section for the waste accumulation unit.

* * * * *

PART 266—STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES

■ 6. The authority for part 266 continues to read as follows:

Authority: 42 U.S.C. 1006, 2002(a), 3001–3009, 3014, 3017, 6905, 6906, 6912, 6921, 6922, 6924–6927, 6934, and 6937.

■ 7. Section 266.508 is amended by revising paragraph (a)(2)(ii) to read as follows:

§ 266.508 Shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility or evaluated hazardous waste pharmaceuticals from a reverse distributor.

(a) * * *

(2) * * *

(ii) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals must write the word "PHRM" or "PHARMS" in Item 13 of EPA Form 8700–22. A healthcare facility may also include the applicable EPA hazardous waste numbers (*i.e.,* hazardous waste codes) in Item 13 of EPA Form 8700–22.

* * * * *

[FR Doc. 2024–28802 Filed 12–10–24; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–2023–0021]

RIN 2127–AM37

Federal Motor Vehicle Safety Standards; Automatic Emergency Braking Systems for Light Vehicles; Correction

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Final rule; response to petitions for reconsideration; correction.

SUMMARY: This document corrects a November 26, 2024 final rule partially granting petitions for reconsideration of a May 9, 2024, final rule that adopted Federal Motor Vehicle Safety Standard (FMVSS) No. 127, "Automatic Emergency Braking for Light Vehicles," which requires automatic emergency braking (AEB), pedestrian automatic emergency braking (PAEB), and forward collision warning (FCW) systems on all new light vehicles. This document corrects a typographical error in the amendatory instructions.

DATES: Effective January 27, 2025.

ADDRESSES: Correspondence related to this rule should refer to the docket number set forth above (NHTSA–2023–0021) and be submitted to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: For technical issues: Mr. Markus Price, Office of Crash Avoidance Standards, Telephone: (202) 366–1810, Facsimile: (202) 366–7002. For legal issues: Mr. Eli Wachtel, Office of the Chief Counsel, Telephone: (202) 366–2992, Facsimile: (202) 366–3820. The mailing address for these officials is: National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590.

SUPPLEMENTARY INFORMATION: In FR Doc. 2024–27349 appearing on page 93199 in the **Federal Register** of Tuesday, November 26, 2024, the following correction is made:

§ 571.127 [Corrected]

■ On page 93220, in the first column, in part 571, in amendment 2.b, the instruction "Revising S5.1.1(a)(3) and (4), S5.1.1(b)(2), S5.1.3, and S8.3.3(g)." is corrected to read "Revising S5.1.1(a)(3) and (4), S5.1.1(b)(1), S5.1.3, and S8.3.3(g).".

Issued in Washington, DC, under authority delegated in 49 CFR 1.95 and 501.8.

Raymond R. Posten,

Associate Administrator, Rulemaking.

[FR Doc. 2024–28998 Filed 12–10–24; 8:45 am]

BILLING CODE P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 29

[Docket No. FWS–HQ–NWRS–2019–0017; FF09R50000–XXX–FVRS3451900000]

RIN 1018–BD78

Permitting of Rights-of-Way Across National Wildlife Refuges and Other U.S. Fish and Wildlife Service-Administered Lands

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are revising our process for permitting of rights-of-way across National Wildlife Refuge System lands and other Service-administered lands. By aligning Service processes more closely with those of other Department of the Interior bureaus, to the extent practicable and consistent with applicable law, we will reduce the amount of time the Service requires to process applications for rights-of-way across Service-managed lands. We will require a preapplication meeting and use of a standard application, allow electronic submission of applications, and provide the Service with additional flexibility, as appropriate, to determine the fair market value or fair market rental value of rights-of-way across Service-managed lands. Additionally, we are implementing new permit terms and conditions and other regulatory changes.

DATES: This rule is effective January 10, 2025.