



**ENVIRONMENTAL PROTECTION AGENCY**

**6560-50-P**

**40 CFR Part 82**

[EPA-HQ-OAR-2012-0580 **FRL-9798-4**]

[RIN 2060-AM09]

Protection of Stratospheric Ozone: Revision of the Venting Prohibition for Specific Refrigerant Substitutes

**AGENCY:** Environmental Protection Agency (EPA)

**ACTION:** Proposed rule.

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**SUMMARY:** The Environmental Protection Agency is proposing to amend the regulations promulgated as part of the National Recycling and Emission Reduction Program under section 608 of the Clean Air Act. EPA is proposing to exempt from the prohibition under section 608 on venting, release and disposal certain refrigerant substitutes listed as acceptable or acceptable subject to use conditions in regulations promulgated as part of EPA's Significant New Alternative Policy Program under section 612 of the Act on the basis of current evidence that their venting, release and disposal does not pose a threat to the environment.

**DATES:** Written comments on this proposed rule must be received by the EPA Docket on or before on [INSERT 60 DAYS FROM DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Any Party requesting a public hearing must notify the contact listed below under FOR FURTHER INFORMATION CONTACT by 5 p.m. Eastern Standard Time on [INSERT 15 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. If a hearing is held, it will take place on or about [INSERT 25 DAYS AFTER PUBLICATION IN THE FEDERAL

REGISTER] at EPA Headquarters in Washington, DC. EPA will post a notice in our website, <http://www.epa.gov/ozone/strathome.html>, announcing further information should a hearing take place.

**ADDRESSES:** EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2012-0580. All documents in the docket are listed on the [www.regulations.gov](http://www.regulations.gov) web site. 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 either electronically through [www.regulations.gov](http://www.regulations.gov) or in hard copy from the EPA Air and Radiation Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. This Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Sally Hamlin Stratospheric Protection Division, Office of Air and Radiation, MC 6205J, Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, DC 20460; telephone number: (202) 343-9711; fax number: (202) 343-2338; email address: [hamlin.sally@epa.gov](mailto:hamlin.sally@epa.gov).

**SUPPLEMENTARY INFORMATION:** This proposed action, if finalized as proposed, would extend the exemption from the venting prohibition at 40 CFR § 82.154(a)(1) to certain

refrigerant substitutes in certain end-uses for which EPA has found the refrigerant substitutes acceptable or acceptable subject to use conditions under CAA section 612 and the implementing regulations at 40 CFR Part 82, Subpart G. Specifically, EPA is proposing to exempt from the venting prohibition isobutane (R-600a) and R-441A, which were listed as acceptable, subject to use conditions, as refrigerant substitutes in household refrigerators, freezers, and combination refrigerators and freezers, and propane (R-290), which was listed as acceptable, subject to use conditions, as a refrigerant substitute in retail food refrigerators and freezers (standalone units only).

## **TABLE OF CONTENTS**

### *I. General information*

*A. Does This Action Apply to Me?*

*B. What abbreviations and acronyms are used in this action?*

*C. What should I consider as I prepare my comments for EPA?*

*II. How does the national recycling and emission reduction program work?*

*III. What is EPA's determination of whether venting, release or disposal poses a threat to the environment?*

*IV. What revision to the venting prohibition is EPA proposing?*

*V. Statutory and Executive Order Reviews*

*A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563:*

*Improving Regulation and Regulatory Review*

*B. Paperwork Reduction Act*

*C. Regulatory Flexibility Act*

*D. Unfunded Mandates Reform Act*

*E. Executive Order 13132: Federalism*

*F. Executive Order 13175: Consultation and Coordination with Indian Tribal*

*Governments*

*G. Executive Order 13045: Protection of Children from Environmental Health Risks and*

*Safety Risks*

*H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or*

*Use*

*I. National Technology Transfer Advancement Act*

*J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

*VI. References*

## **I. General information**

*A. Does This Action Apply to Me?*

Potentially regulated entities may include, but are not limited to, the following.

Table 1 – Potentially Regulated Entities, by North American Industrial Classification System

(NAICS) Code

Category	NAICS code	Description of regulated entities
Services	811412	Appliance repair and maintenance

Industry	333415	Manufacturers of refrigerators, freezers, and other refrigerating or freezing equipment, electric or other; heat pumps not elsewhere specified or included (NESOI); and parts thereof
Industry	562920, 423930	Facilities separating and sorting recyclable materials from non-hazardous waste streams (e.g., scrap yards) and merchant wholesale distribution of industrial scrap and other recyclable materials

This table is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this proposed action. Other types of entities not listed in the table could also be affected. To determine whether your company is regulated by this action, you should carefully examine the applicability criteria contained in section 608 of the Clean Air Act (CAA, the Act) as amended, and relevant implementing regulations at 40 CFR Part 82, Subpart F. If you have any questions about whether this proposed action applies to a particular entity, consult the person listed in the preceding section, “FOR FURTHER INFORMATION CONTACT.”

*B. What abbreviations and acronyms are used in this action?*

*ASHRAE* - American Society of Heating, Refrigerating and Air-Conditioning Engineers

*ANSI* - American National Standards Institute

*CAA* - Clean Air Act

*CAS* - Chemical Abstracts Service

*CBI* - confidential business information

*CFC* - chlorofluorocarbon

*CFR* - Code of Federal Regulations

*EPA* - United States Environmental Protection Agency

*EO* - Executive Order

*FR* - Federal Register

*GWP* - Global warming potential

*HCFC-22* - the chemical chlorodifluoromethane, CAS Reg No. 75-45-6

*HCFC-142b* - the chemical 1-chloro-1,1-difluoroethane, CAS Reg No. 75-68-3

*HFC* - hydrofluorocarbon

*HFC-134a* - the chemical 1,1,1,2-tetrafluoroethane, CAS Reg. No. 811-97-2

*IDLH* - Immediately Dangerous to Life and Health

*LFL* - lower flammability limit

*MVAC* - motor vehicle air conditioning

*NIOSH* - National Institute for Occupational Safety and Health

*NPRM* - Notice of Proposed Rulemaking

*NTTAA* - National Technology Transfer and Advancement Act

*ODP* - ozone depletion potential

*ODS* - ozone-depleting substance

*OMB* - United States Office of Management and Budget

*OSHA* - United States Occupational Safety and Health Administration

*PEL* - Permissible Exposure Level

*ppm* - parts per million

*REL* - Recommended Exposure Level

*RFA* - Regulatory Flexibility Act

*SBREFA* - Small Business Regulatory Enforcement Fairness Act

*SNAP* - Significant New Alternatives Policy

*STEL* - Short Term Exposure Limit

*TWA* - Time Weighted Average

*UMRA* - Unfunded Mandates Reform Act

*C. What should I consider as I prepare my comments for EPA?*

1. Confidential business information (CBI)

Do not submit confidential business information (CBI) to EPA through <http://www.regulations.gov> or e-mail. Submit information that you claim to be CBI to the person listed under the heading FOR FURTHER INFORMATION CONTACT. Clearly mark the part of the information that you claim to be CBI. For CBI information in a disk or CD-ROM that you mail to EPA, mark the outside of the disk or CD-ROM as CBI and then identify electronically within the disk or CD-ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with

procedures set forth in 40 CFR 2.2.

## 2. Tips for preparing your comments

When submitting comments, remember to do the following:

- a) Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- b) Follow directions. The agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.
- c) Explain why you agree or disagree with the proposal; suggest alternatives and substitute language for your requested changes.
- d) Describe any assumptions and provide any technical information and/or data that you used in preparing your comments.
- e) If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- f) Provide specific examples to illustrate your concerns, and suggest alternatives.
- g) Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- h) Make sure to submit your comments by the comment period deadline identified.

## **II. How does the national recycling and emission reduction program work?**

*A. What are the statutory requirements under section 608 of the Clean Air Act?*



Section 608 of the Act as amended, titled *National Recycling and Emission Reduction Program*, requires EPA to establish regulations governing the use and disposal of ozone-depleting substances (ODS) used as refrigerants, such as certain chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), during the service, repair, or disposal of appliances and industrial process refrigeration (IPR), including air-conditioning and refrigeration equipment. Section 608 also prohibits any person in the course of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration, to knowingly vent or otherwise knowingly release or dispose of such ODS used as refrigerants therein in a manner which permits such substances to enter the environment. This prohibition similarly applies to the venting, release, or disposal of substitutes for such ODS used as refrigerants, unless the Administrator determines that venting, releasing, or disposing of such a substitute does not pose a threat to the environment.

Section 608 is divided into three subsections. Briefly, section 608(a) requires EPA to promulgate regulations to reduce the use and the emissions of class I substances (e.g., CFCs and halons) and class II substances (HCFCs) to the lowest achievable level and to maximize the recapture and recycling of such substances. Section 608(b) requires that the regulations promulgated pursuant to subsection (a) contain standards and requirements for the safe disposal of class I and class II substances. Finally, section 608(c) contains self-effectuating provisions that prohibit any person from knowingly venting, releasing or disposing of any class I or class II substances, and their substitutes, used as refrigerants in appliances or IPR in a manner which permits such substances to enter the environment during maintenance, repairing, servicing, or disposal of appliances or IPR.

EPA's authority to propose the requirements in this Notice of Proposed

Rulemaking (NPRM) is based on section 608. As noted above, section 608(a) requires EPA to promulgate regulations regarding use and disposal of class I and II substances to “reduce the use and emission of such substances to the lowest achievable level” and “maximize the recapture and recycling of such substances.” Section 608(a) further provides that “[s]uch regulations may include requirements to use alternative substances (including substances which are not class I or class II substances) . . . or to promote the use of safe alternatives pursuant to section [612] or any combination of the foregoing.” Section 608(c)(1) provides that, effective July 1, 1992, it is “unlawful for any person, in the course of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration, to knowingly vent or otherwise knowingly release or dispose of any class I or class II substance used as a refrigerant in such appliance (or industrial process refrigeration) in a manner which permits such substance to enter the environment.” The statute exempts from this self-effectuating prohibition “[d]e minimis releases associated with good faith attempts to recapture and recycle or safely dispose” of such a substance. To implement and enforce the venting prohibition<sup>1</sup>, EPA, as codified in its regulations, interprets releases to meet the criteria for exempted “de minimis” releases if they occur when the recycling and recovery requirements of regulations promulgated under sections 608 and 609 are followed. 40 CFR §82.154(a)(2).

Effective November 15, 1995, section 608(c)(2) of the Act extends the prohibition in section 608(c)(1) to knowingly venting or otherwise knowingly releasing or disposing of any refrigerant substitute for class I or class II substances by any person maintaining, servicing, repairing, or disposing of appliances or IPR. This prohibition applies to any such substitute substance unless the Administrator determines that such venting, releasing, or disposing “does

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<sup>1</sup> In this proposal, EPA sometimes uses the shorthand “venting prohibition” to refer to the section 608(c) prohibition of knowingly venting, releasing, or disposing of class I or class II substances, and their substitutes.

not pose a threat to the environment.” Thus, section 608(c) provides EPA authority to promulgate regulations to interpret, implement, and enforce this venting prohibition, including authority to implement section 608(c)(2) by exempting certain substitutes for class I or class II substances from the prohibition when the Administrator determines that such venting, release, or disposal does not pose a threat to the environment.

*B. What are the regulations against venting, releasing or disposing of refrigerant substitutes?*

Final regulations promulgated under section 608 of the Act, published on May 14, 1993 (58 FR 28660), established a recycling program for ozone-depleting refrigerants recovered during the servicing and maintenance of air-conditioning and refrigeration appliances. In the same 1993 final rule, EPA also promulgated regulations implementing the section 608(c) prohibition on knowingly venting, releasing or disposing of class I or class II controlled substances.<sup>2</sup> These regulations substantially reduced the use and emissions of ozone-depleting refrigerants.

On June 11, 1998, EPA proposed to implement and clarify the requirements of section 608(c)(2) of the Act by clarifying how the prohibition on venting extends to substitutes for CFC and HCFC refrigerants (63 FR 32044). EPA issued a final rule March 12, 2004 (69 FR 11946) and a second rule on April 13, 2005 (70 FR 19273) clarifying how the venting prohibition in section 608(c) applies to refrigerant substitutes (e.g., hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) in part or whole) during the maintenance, service, repair, or disposal of appliances. These regulations were codified at 40 CFR part 82, subpart F. The regulation at 40 CFR 82.154(a) states that:

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<sup>2</sup> A list of ozone-depleting substances is available in Appendices A and B to Subpart A of Part 82.

“[e]ffective June 13, 2005, no person maintaining, servicing, repairing, or disposing of appliances may knowingly vent or otherwise release into the environment any refrigerant or substitute<sup>3</sup> from such appliances, with the exception of the following substitutes in the following end-uses:

- i. Ammonia in commercial refrigeration, or in [IPR] or in absorption units;
- ii. Hydrocarbons in [IPR] (processing of hydrocarbons);
- iii. Chlorine in [IPR] (processing of chlorine and chlorine compounds);
- iv. Carbon dioxide in any application;
- v. Nitrogen in any application; or
- vi. Water in any application.

(2) The knowing release of a refrigerant or non-exempt substitute subsequent to its recovery from an appliance shall be considered a violation of this prohibition. De minimis releases associated with good faith attempts to recycle or recover refrigerants or non-exempt substitutes are not subject to this prohibition.”

As explained in EPA’s earlier rulemaking concerning refrigerant substitutes, EPA has not promulgated regulations requiring certification of refrigerant recycling/recovery equipment intended for use with substitutes to date (70 FR 19275; April 13, 2005). However, as EPA has noted, the lack of a current regulatory provision should not be considered as an exemption from the venting prohibition for substitutes that are not expressly exempted in §82.154(a). *Id.* EPA has also noted that, in accordance with section 608(c) of the Act, the regulatory prohibition at §82.154(a) reflects the statutory references to *de minimis* releases of substitutes as they pertain

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<sup>3</sup> “Substitute,” as defined at 40 CFR part 82, subpart F, is “any chemical or product, whether existing or new, that is used by any person as an EPA approved replacement for a class I or II ozone-depleting substance in a given refrigeration or air-conditioning end-use.” 40 CFR 82.152.

to good faith attempts to recapture and recycle or safely dispose of non-exempted substitutes.

*Id.*

### **III. What is EPA's determination of whether venting, release or disposal poses a threat to the environment?**

Section 608(c)(2) extends the prohibition on venting in section 608(c)(1) to substitutes for class I or class II substances, unless the Administrator determines that such venting, releasing, or disposing does not pose a threat to the environment. As explained above, in earlier rulemakings, EPA has exempted some refrigerant substitutes in specified end uses from the venting prohibition under CAA section 608, as addressed under 40 CFR 82.154(a)(1).

Today EPA is proposing a determination to exempt from the venting prohibition three hydrocarbon refrigerant substitutes that EPA has previously listed as acceptable or acceptable subject to use conditions in the specified end uses under the Significant New Alternatives Policy (SNAP) program (76 FR 78832, December 20, 2011) as the venting, release, or disposal of these substitutes does not pose a threat to the environment. Specifically, EPA is proposing to exempt from the venting prohibition isobutane (R-600a) and R-441A, which were listed as acceptable, subject to use conditions, as refrigerant substitutes in household refrigerators, freezers, and combination refrigerators and freezers, and propane (R-290), which was listed as acceptable, subject to use conditions, as a refrigerant substitute in retail food refrigerators and freezers (standalone units only).

This proposed exemption to the venting prohibition would not apply to refrigerants that

are hydrocarbon blends containing any amount of any CFC, HCFC, HFC<sup>4</sup>, or PFC. EPA is seeking comment on this proposal that blends of hydrocarbons with any amount of any CFC, HCFC, HFC, or PFC not be exempt from the current prohibition on venting, release or disposal.

The SNAP program, established under section 612 of the CAA, requires EPA to publish a list of substitutes for class I and class II substances that are unacceptable for certain uses and those that are acceptable for specific uses. In identifying acceptable substitutes under section 612(c), EPA is required to consider whether those substitutes present a significantly greater risk to human health and the environment as compared with other substitutes that are currently or potentially available. On March 18, 1994, EPA published the original rulemaking under section 612 of the CAA (59 FR 13044) which established the process for administering the SNAP program and issued EPA's first lists identifying acceptable and unacceptable substitutes in major industrial use sectors. The regulations are codified at 40 CFR Part 82, subpart G.

For purposes of section 608(c)(2) of the CAA, EPA considers two factors in determining whether or not venting, release, or disposal of a substitute refrigerant during the maintenance, service, repair or disposing of appliances poses a threat to the environment. See 69 FR 11948 (March 12, 2004). First, EPA determines whether venting, release, or disposal of the substitute refrigerant poses a threat to the environment due to inherent characteristics of the refrigerant, such as global warming potential. Second, EPA determines whether and to what extent such venting, release, or disposal actually takes place during the maintenance, servicing, repairing, or disposing of appliances, and to what extent such venting, release, or disposal is controlled by other authorities, regulations, or practices. To the extent that such releases are adequately controlled by other authorities, EPA defers to those authorities.

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<sup>4</sup> Hydrofluorocarbons (HFCs) also include Hydrofluoroolefins (HFOs), which have at least one double bond between carbon atoms.

In addressing these two factors, the analysis below discusses the potential environmental impacts and existing authorities, practices, and controls for isobutane (R-600a) and R-441A as substitutes in household refrigerators, freezers, and combination refrigerators and freezers; and propane (R-290) as a substitute in retail food refrigerators and freezers (standalone units only). These refrigerants and end-uses were evaluated and determined to be acceptable or acceptable subject to use conditions under SNAP in the December 20, 2011 final rule.

#### A. Potential Environmental Impacts

In the December 20, 2011 SNAP rule, EPA's analysis of environmental impacts for these refrigerant substitutes discussed four types of environmental risks: ozone depletion potential, global warming potential, volatile organic compound (VOC) effects, and ecosystem risks (76 FR 78838). For this proposal, EPA's discussion of potential environmental impacts for these refrigerant substitutes similarly focuses on the environmental risks associated with ozone depletion potential, global warming potential, VOC effects, and ecosystem risks.

Hydrocarbons are VOCs. Hydrocarbons as VOCs can contribute to ground-level ozone (smog) formation and therefore indirectly contribute to global warming since the Intergovernmental Panel on Climate Change has identified ground-level ozone as a greenhouse gas.<sup>5</sup> EPA's 1994 risk screen document, which was developed for the initial rule establishing the SNAP program listing hydrocarbons acceptable for an end-use (i.e., industrial process refrigeration - processing of hydrocarbons), describes the potential emissions of VOCs from all substitutes for all end-uses in the refrigeration and air-conditioning sector as likely to be insignificant relative to VOCs from all other sources (i.e., other industries, mobile sources, and

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<sup>5</sup> Intergovernmental Panel on Climate Change (IPCC) 2001.

biogenic sources).<sup>6</sup> A more recent analysis indicates that in the extremely unlikely event that all appliances in end-uses recently found acceptable or acceptable with use conditions under SNAP (76 FR 78838; December 20, 2011) were to leak their entire hydrocarbon charge over the course of a year, the resulting increase in annual VOC emissions, as a percent of all annual VOC emissions in the U.S., would be negligible.<sup>7</sup> Therefore, the use of these hydrocarbons in the household refrigeration and retail food refrigeration end-uses is sufficiently small that it would not have a noticeable impact on local air quality.

The global warming potential (GWP) of hydrocarbons is very low (i.e., less than 10). When compared to the GWP of other refrigerant substitutes, the GWPs of hydrocarbons are hundreds or thousands of times smaller, signifying significantly reduced global warming impact on a molecule per molecule basis. For example, the refrigerant substitutes R134A, R404A, R407C, and R410A have a GWP of 1430, 3920, 1770, and 2090, respectively over a 100 year time horizon compared with the hydrocarbons in this rule that have a GWP of less than 10 integrated over a 100 year time horizon<sup>8</sup>. As noted in the preceding paragraph, the volume of hydrocarbons listed as acceptable or acceptable with use conditions under SNAP that could be released from the specific uses relevant to this proposal would be small. Relative to the enormous volume of carbon dioxide (CO<sub>2</sub>) that is emitted to the atmosphere, with its global warming potential (GWP) of one (1), the volume of hydrocarbons that are listed as refrigerant substitutes under SNAP that might be released to the atmosphere is so small that it would have a negligible impact on the global climate.

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<sup>6</sup> EPA, 1994. Significant New Alternative Policy Technical Background Document.

<sup>7</sup> As EPA noted in the December 20, 2011 SNAP rule, as a percent of annual VOC emissions in the U.S., this represents approximately  $5 \times 10^{-6}$  percent (for isobutane in the household food refrigeration end-use),  $5 \times 10^{-6}$  percent (for propane in the retail food refrigeration end-use), and  $3 \times 10^{-7}$  percent (for R-441A in the household food refrigeration end-use) (76 FR 78838).

<sup>8</sup> Global warming potential values are from the IPCC Fourth Assessment Report: Climate Change 2007 (AR4).



Hydrocarbons have an ozone depletion potential (ODP) of zero.<sup>9</sup> The hydrocarbons listed as acceptable or acceptable with use conditions under SNAP do not contain chlorine or bromine, the two most prominent elements in chemicals that deplete stratospheric ozone.

Similarly, EPA expects that releases of these hydrocarbons into the environment from their use as refrigerant substitutes will not pose significant ecosystem risks. Hydrocarbons are volatile and break down in the atmosphere into naturally-occurring compounds in a relatively short time frame, with atmospheric lifetimes between 7 - 8 days. Due to their fast interaction with OH radicals in the atmosphere and resulting decomposition, and the known degradation products from this reaction with OH radicals, EPA does not expect any significant amount of deposition to adversely affect aquatic or terrestrial ecosystems (76 FR 78838; December 20, 2011).

Based on this analysis, EPA is proposing to find that the venting, release, or disposal of isobutane (R-600a) and R-441A as substitutes in household refrigerators, freezers, and combination refrigerators and freezers; and propane (R-290) as a substitute in retail food refrigerators and freezers (standalone units only) is not expected to pose a significant threat to the environment based on the inherent characteristics of these substances.

## B. Toxicity and Flammability

In this section the Agency is providing information about toxicity and flammability of the three hydrocarbon refrigerants listed as acceptable or acceptable with use conditions under

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<sup>9</sup> A chemical's ODP is the ratio of its impact on stratospheric ozone compared to the impact of an identical mass of trichlorofluoromethane (CFC-11). The ODP of CFC-11 is defined as 1.0. The GWP quantifies a substance's potential integrated climate forcing relative to carbon dioxide (CO<sub>2</sub>) over a specified time horizon. The 100-year integrated GWPs of isobutane, propane, and hydrocarbon blend R-441A were estimated to be 8, 3, and less than 5, respectively (76 FR 78838; December 20, 2011).

SNAP (76 FR 78832; December 20, 2011). Additional information is available in that final SNAP rule.

Hydrocarbons, including propane, isobutane and the hydrocarbon blend known as R-441A, are classified as A3 refrigerants by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 34-2010, indicating that they have low toxicity and high flammability. Like most refrigerants, hydrocarbons can displace oxygen at high concentrations and cause asphyxiation. The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs) time weighted average (TWAs)<sup>10</sup> for propane, isobutane, and butane, are 1,000ppm, 800ppm, and 800ppm, respectively. The Occupational Safety and Health Administration (OSHA) established a Permissible Exposure Limit (PEL) for propane of 1,000 ppm, and NIOSH established levels Immediately Dangerous to Life and Health (IDLHs) of 20,000 ppm and 50,000 ppm for propane and butane, respectively.

In prior actions under SNAP, EPA has evaluated the risks hydrocarbons used in certain refrigerant end uses could pose to workers and consumers and found that occupational exposures to these hydrocarbons should not pose a toxicity threat in these end-uses because the time-weighted average (TWA) exposures were significantly below industry and government occupational exposure limits (76 FR 78839; December 20, 2011).

EPA estimated the maximum TWA exposure for worker exposure scenarios and compared this value to relevant exposure limits for isobutane, propane, and hydrocarbon blends. The modeling results indicated that both the short-term (15-minute and 30-minute) and long-term (8-hour) worker exposure concentrations at no point are likely to exceed 2 percent (for isobutane), 50 percent (for propane), and 4 percent (for hydrocarbon blends) of the NIOSH REL

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<sup>10</sup> REL-TWA is a time weighted average concentration for up to a 10-hour workday during a 40-hour workweek (NIOSH, 2005).

for isobutane and propane or the refrigerant components for the hydrocarbon blends (ICF, 2009)<sup>11</sup>.

EPA assessed the consumer and end-user exposure to the three hydrocarbons in both the household refrigeration end-use and for the retail food end-use. Even under the very conservative reasonable worst-case scenarios that were modeled, EPA found that exposures to any of the three hydrocarbons would not pose a toxicity threat because the TWAs were significantly lower than the NOAEL and/or acute exposure guideline level (AEGL)<sup>12</sup>.

EPA has also evaluated the exposure risks to the general population for the use of the three hydrocarbons as a refrigerant in their respective end-uses. EPA concluded in a SNAP final rule (76 FR 78832; December 20, 2011) that these hydrocarbons are unlikely to pose a toxicity risk to the general population, when used according to the applicable use conditions or regulations.

Hydrocarbons have lower flammability limits (LFLs)<sup>13</sup> ranging from 16,000 ppm to 21,000 ppm.<sup>14</sup> In prior rulemakings, EPA evaluated the potential risks of fire from the use of hydrocarbons as refrigerants in certain appliances, and engineering approaches to avoid ignition sources from the appliance. To address flammability risks, EPA issued recommendations for their safe use in certain end-uses through SNAP rulemakings (59 FR 13044; 76 FR 78832) and

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<sup>11</sup> SNAP hydrocarbon rule docket EPA-HQ-OAR-2009-0286: 1) ICF, 2009. ICF Consulting. ‘Significant New Alternatives Policy Program Refrigeration and Air Conditioning Sector—Risk Screen on Substitutes for CFC-12 in Household Refrigerators and Household Freezers—Substitute: Isobutane’, May 22, 2009. 2) ICF, 2009. ICF Consulting. ‘Significant New Alternatives Policy Program Refrigeration and Air Conditioning Sector—Risk Screen on Substitutes for CFC-12, HCFC-22 and R502 in Retail Food Refrigeration—Substitute: Propane’, May 26, 2009. 3) ICF, 2009. ICF Consulting. ‘Significant New Alternatives Policy Program in the Household Refrigeration Sector—Risk Screen on Substitutes for CFC-12 and HCFC-22 in Household Refrigerators, Household Freezers and Window AC Units—Substitute: HCR-188C’, July 17, 2009. 4) ICF, 2009. ICF Consulting. ‘Significant New Alternatives Policy Program in the Household Refrigeration Sector—Risk Screen on Substitutes for CFC-12 and HCFC-22 in Household Refrigerators and Freezers—Substitute: HCR-188C1’, November 6, 2009.

<sup>12</sup> *Ibid.*

<sup>13</sup> LFL is the minimum concentration in air at which flame propagation occurs.

<sup>14</sup> Isobutane, propane and a hydrocarbon blend, R-441a, have a LFL of 18,000ppm, 21,000ppm, and 16,000ppm, respectively.

specified use conditions for some end-uses.<sup>15</sup> These SNAP rules indicated that existing regulatory requirements and industry standards and practices adequately protect workers, the general population, and the environment from the flammability risks from hydrocarbon refrigerants. Furthermore, the Agency believes that the flammability risks and occupational exposures to hydrocarbons are adequately regulated by OSHA, building, and fire codes at a local and national level.

### C. Authorities, Controls and Practices

Within the heating, ventilation, and air-conditioning (HVAC) sector and the refrigeration sector, EPA has approved hydrocarbons under the SNAP program for use in IPR (processing of hydrocarbons), in household refrigeration, and in retail food (stand-alone units) refrigeration systems. In these applications, hydrocarbons have the potential to come into contact with workers, the general population, and the environment. However, analyses performed for both this proposed rule and the SNAP rules issued in 1994 and 2011 (59 FR 13044 and 76 FR 38832, respectively) indicate that existing regulatory requirements and industry practices designed to limit and control these substances adequately control the emission of the listed hydrocarbon refrigerants. EPA concludes that the limits and controls under other authorities, regulations or practices adequately control the release and exposure to the three hydrocarbons and mitigate risks from any possible release. This conclusion is relevant to the second factor mentioned above in the overall determination of whether venting, release, or disposal of a substitute refrigerant poses a threat to the environment—that is, a consideration of the extent that such venting, release, or disposal is adequately controlled by other authorities, regulations, or practices. As

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<sup>15</sup> Use conditions for hydrocarbons in certain refrigeration end-uses are found at 40 CFR part 82 subpart G, appendix R.

such, this conclusion is another part of the determination that the venting, release or disposal of these three hydrocarbon refrigerants does not pose a threat to the environment.

Industry service practices for hydrocarbon refrigeration equipment, according to industry and OSHA guidelines and standards, include monitoring efforts, engineering controls, and operating procedures. System alarms, flame detectors, and fire sprinklers are used to protect worker, process, and storage areas. During servicing, OSHA requirements are followed, including continuous monitoring of explosive gas concentrations and oxygen levels.<sup>16</sup>

In general, hydrocarbon emissions from refrigeration systems are likely to be significantly smaller than those emanating from the industrial process and storage systems, which are controlled for safety reasons. Further, in the SNAP rule listing hydrocarbons as acceptable subject to use conditions for use in household and commercial stand-alone refrigerators and freezers, the amount of refrigerant from a refrigerant loop is limited (57g for household refrigerators and freezers and 150g for commercial stand-alone refrigerators and freezers), indicating that hydrocarbon emissions are likely to be relatively small and adequately controlled.

Occupational exposures to hydrocarbons are primarily controlled by OSHA requirements and national and local building and fire codes. OSHA's Process Safety Management, confined space entry, and HAZWOPER requirements apply to all hydrocarbon refrigerants. These requirements include employee training, emergency response plans, air monitoring, and written standard operating procedures.

Hydrocarbons are regulated as VOCs under sections of the Clean Air Act that address attainment and maintenance of the National Ambient Air Quality Standards for ground level

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<sup>16</sup> The OSHA standards and requirements for servicing hydrocarbons, as per 29 CFR 1910, include parts 1910.24 (on ventilation), 1910.106 (on flammable and combustible liquids), 1910.110 (on storage and handling of liquified petroleum gases), and 1910.1000 (on toxic and hazardous substances).

ozone, including those sections addressing development of State Implementation Plans and those addressing permitting of VOC sources.

The release and/or disposal of many refrigerant substitutes, including hydrocarbons, are controlled by other authorities including those established by OSHA and NIOSH guidelines, various standards, and state and local building codes. To the extent that release during the maintenance, repair, servicing or disposal of appliances is controlled by regulations and standards of other authorities, EPA believes these practices and controls for the use of hydrocarbons are sufficiently protective. These practice and controls could help mitigate any risk to the environment that may be posed by the venting, release or disposal of these three hydrocarbon refrigerants during the maintaining, servicing, repairing, or disposing of appliances. This conclusion addresses the second factor in the analysis described above and is thus part of the determination that the venting, release or disposal of these hydrocarbon refrigerant substitutes does not pose a threat to the environment.

#### D. Conclusion

EPA has reviewed the potential environment impacts of three hydrocarbon refrigerants in the end uses that we have listed as acceptable or acceptable subject to use conditions under SNAP, as well as the authorities, controls and practices in place for these three hydrocarbon refrigerants. Based on this review, EPA concludes that these three hydrocarbon refrigerants are not expected to pose a significant threat to the environment based on the inherent characteristics of these substances and the limited quantities used in the relevant applications. EPA additionally concludes that existing authorities, controls, and practices help mitigate environmental risk from the release of these three hydrocarbon refrigerants. In light of these two conclusions, EPA is

proposing to determine, in accordance with 608(c)(2), that based on current evidence and risk analyses, the venting, release or disposal of these hydrocarbon refrigerants does not pose a threat to the environment. EPA is therefore proposing to extend the regulatory exemption from the venting prohibition at 40 CFR §82.154(a)(1) that is currently in place for hydrocarbons used in IPR, to include the other uses for which hydrocarbons have been found acceptable or acceptable subject to conditions of use under the SNAP program. EPA requests comment on this proposed determination and action.

#### **IV. What revision to the venting prohibition is EPA proposing?**

EPA is proposing to revise the existing prohibition against knowing venting of refrigerant substitutes, extending the exemption to certain refrigerants consisting wholly of hydrocarbons and used in refrigeration uses listed by EPA as acceptable or acceptable subject to use conditions under EPA's SNAP program.<sup>17</sup> This is separate from and in addition to the current exemption for hydrocarbon refrigerants used in IPR.<sup>18</sup> EPA is proposing to find that for the purposes of CAA section 608(c)(2), the venting, release or disposal of such hydrocarbon refrigerants from appliances does not pose a threat to the environment, considering both the inherent characteristics of these substances and other authorities, controls and practices that apply to such refrigerants. This proposed exemption to the venting prohibition would apply to the three hydrocarbons where they are used in household food refrigeration units and retail food refrigeration (stand-alone units); a separate exemption has already been promulgated for certain

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<sup>17</sup> Hydrocarbons (propane or R-290, butane or R-600, hydrocarbon blend A, and hydrocarbon blend B) were listed as acceptable substitutes in industrial process refrigeration (processing of hydrocarbons) (59 FR 13044). On December 20, 2011, EPA published a final rule (76 FR 78832) listing certain hydrocarbons (i.e., isobutane, propane, and hydrocarbon blend R-441A) as acceptable subject to use conditions in some refrigeration end-uses.

<sup>18</sup> See 40 CFR 82.154(a), 69 FR 11979, and 70 FR 19278.

hydrocarbons in IPR (processing of hydrocarbons), and we are not proposing to amend that exemption in this rulemaking. Today's proposal would exempt from the prohibition against knowing venting during the maintenance, servicing, repair or disposal of appliances three hydrocarbon refrigerants listed as acceptable or acceptable subject to use conditions by the SNAP program: propane, isobutane, and the hydrocarbon blend R-441A.

Today's proposed changes would not affect the existing regulatory exemptions from the venting prohibition under 608(c)(2) for refrigerant substitutes (i.e., ammonia in commercial refrigeration, or IPR, or in absorption units; hydrocarbons in IPR – processing of hydrocarbons; chlorine in IPR - processing of chlorine and chlorine compounds; carbon dioxide in any application; nitrogen in any application; or water in any application). EPA previously issued a determination finding these refrigerant substitutes do not pose a threat to the environment and amended the regulations at § 82.154(a)(1) to exempt these substitutes in these uses from the venting prohibition (69 FR 11946, March 12, 2004; 70 FR 19278, April 13, 2005). EPA is not proposing to amend those provisions, and therefore, this proposal should not affect those prior exemptions to the venting prohibition.

EPA requests comments on today's proposed determination exempting from the venting prohibition three hydrocarbon refrigerants listed as acceptable or acceptable subject to use conditions by the SNAP program (propane, isobutane, and the hydrocarbon blend R-441A) . Finally, EPA is not proposing recapture or recycling requirements for hydrocarbons at this time as the Agency believes that recovery equipment designed specifically for flammable refrigerants is not yet widely manufactured or commercially available in the U.S. However, EPA recommends the use of recovery equipment designed for flammable refrigerants, when such



becomes available, in accordance with applicable safe handling practices.<sup>19</sup> While EPA is not proposing recapture or recycling requirements at this time, EPA often provides information concerning best practices used by technicians. Therefore, EPA requests comments on whether hydrocarbon refrigerants should be first recovered and then released to the atmosphere particularly in an area where ventilation or access to outside environment is limited (e.g., room with no windows) and whether this is already common practice today. In addition, EPA is seeking comments about what recovery equipment should be used for recovering isobutane (R-600a) and R-441A, from household refrigerators, freezers, and combination refrigerators and freezers, as well as recovering propane (R-290) from retail food refrigerators and freezers (standalone units only).

## **V. Statutory and Executive Order Reviews**

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

This action is not a "significant regulatory action" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

### *B. Paperwork Reduction Act*

This action does not impose any new information collection burden under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). This action is an Agency determination. It contains no

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<sup>19</sup> EPA provided recommendations on the safe use and handling of hydrocarbons in a SNAP rulemaking listing certain hydrocarbons acceptable subject to use conditions in some refrigeration end-uses (76 FR 78855; December 20, 2011). Recommendations are also found at 40 CFR part 82, subpart G, appendix R.

new requirements for reporting. The Office of Management and Budget (OMB) has previously approved the information collection requirements contained in the existing regulations in subpart F of 40 CFR part 82 under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and has assigned OMB control numbers 2060-0256. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9.

### *C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business that is primarily engaged in the repair and maintenance of appliances and defined by NAIC code 811412 with annual receipts of less than 14 million dollars, or engaged in separating and sorting recyclable materials from non-hazardous waste streams (e.g., scrap yards) and defined by NAIC code 562920 with annual receipts of less than 19 million dollars, and merchant wholesale distribution of industrial scrap and other recyclable materials and defined by NAIC code 423930 with fewer than 100 employees (based on Small Business Administration size standards), (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less

than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives "which minimize any significant economic impact of the rule on small entities." 5 USC 603 and 604. Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

This proposed rule, if it becomes final, is primarily deregulatory as it would exempt persons from the prohibition under section 608(c)(2) of the Clean Air Act, and as implemented by regulations at 40 C.F.R. § 82.145(a)(1), against knowingly venting or otherwise knowingly releasing or disposing of three specific hydrocarbon refrigerants during the maintenance, servicing, repair or disposal of appliances. We have therefore concluded that today's proposed rule will relieve regulatory burden for all affected small entities. We continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

#### *D. Unfunded Mandates Reform Act*

This action contains no Federal mandates under the provisions of Title II of the Unfunded

Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538 for State, local, or tribal governments or the private sector. The action imposes no enforceable duty on any State, local or tribal governments or the private sector. Thus, this action is not subject to the requirements of sections 202 and 205 of the UMRA. This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This action is deregulatory in nature and, if finalized as proposed, would create an exemption from a statutory and regulatory requirement.

*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, as specified in EO 13132 (64 FR 43255, August 10, 1999). This action is deregulatory in nature and, if finalized as proposed, would create an exemption from a statutory and regulatory requirement, which would benefit any state, local, or tribal government to the extent that they are affected. Thus, EO 13132 does not apply to this proposed rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed action from State and local officials.

*F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments*

This action does not have tribal implications, as specified in EO 13175 (65 FR 67249,

November 6, 2000). The proposed rule, if finalized, is deregulatory in nature and would create an exemption that could be available for the tribal communities or Indian tribal governments. Thus, EO 13175 does not apply to this proposed rule.

*G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks*

This action is not subject to the EO 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in Executive Order 12866, and because the Agency does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in sections III in the preamble. The public is invited to submit comments or identify peer-reviewed studies and data that assess effects of early life exposure to the three hydrocarbon refrigerants that are the subject of this proposal.

*H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use*

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

*I. National Technology Transfer Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113, Section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in regulatory activities unless to do so would be inconsistent with

applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This proposed rule does not involve technical standards. Therefore, EPA is not considering the use of any voluntary consensus 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) establishes federal executive policy on environmental justice. Its main provision 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 and low-income populations in the United States.

EPA has determined that this proposed rule exempting certain hydrocarbons from the venting prohibition in end uses listed as acceptable or acceptable subject to use conditions will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because the release of hydrocarbons refrigerants would not pose a threat to the environment. This proposed action would not have any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population.

## VI. References

The documents below are referenced in the preamble. All documents are located in the Air Docket at the address listed in section titled “ADDRESSES” at the beginning of this document. Unless specified otherwise, all documents are available in Docket ID No. EPA-HQ-OAR-2012-0580 at <http://www.regulations.gov>.

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List of Subjects in 40 CFR Part 82

Environmental protection, Administrative practice and procedure, Air pollution control,  
Recycling, Reporting and recordkeeping requirements, Stratospheric ozone layer.

Dated: March 28, 2013.

Bob Perciasepe,  
Acting Administrator.

For the reasons set out in the preamble, 40 CFR Part 82 is proposed to be amended as follows:

**PART 82 - PROTECTION OF STRATOSPHERIC OZONE**

1. The authority citation for Part 82 continues to read as follows:

**Authority:** 42 U.S.C. 7414, 7601, 7671 – 7671g.

2. Section 82.154 is amended by adding section vii to paragraph (a)(1) to read as follows:

**§82.154 Prohibitions.**

(a)(1) \* \* \*

(vii) Effective [DATE 60 days after publication of final rule in the Federal Register], isobutane (R-600a) and R-441A as substitutes in household refrigerators, freezers, and combination refrigerators and freezers; and propane (R-290) as a substitute in retail food refrigerators and freezers (standalone units only).

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