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ALTArefrigeration.com | 403 Dividend Drive • Peachtree City, GA 30269

July 16, 2025

VIA EMAIL
California Air Resources Board
Hydrofluorocarbon Reduction
1001 I Street, Sacramento, California 95814
HFCReduction@arb.ca.gov

Re: ALTA Refrigeration Variance Application

Dear CARB:

ALTA Refrigeration, Inc. ("ALTA") thanks the California Air Resources Board ("CARB") for its feedback on ALTA's March 31, 2025 variance application for cold storage warehouses under Cal. Code Regs. tit. 17 § 95378(c) and the meeting with CARB staff on May 23, 2025. This letter and the attached materials are a resubmission of ALTA's variance application submitted on March 31, 2025 and our subsequent June 23, 2025 supplemental materials, in consolidated format.[1] We have responded to and formatted this submission per CARB's instructions which were provided by phone on July 11, 2025 and by email on July 15, 2025, and our submission now strictly follows CARB's template variance request form, which is enclosed with this letter.

ALTA has modified its original variance application to now propose an 18-month variance of the 150-GWP limit in § 95378(c) until **December 1, 2026**, in order to provide sufficient time for ALTA to re-engineer its EXPERT-brand cold storage refrigeration systems to use HFO 1234-yf as a heat transfer fluid in its systems.[2] Our deployment of these systems in California assumes that the engineering is successful, that 1234-yf remains available in the market, and that A2L refrigerants are allowed by California building codes.

I. About ALTA

ALTA is a manufacturer of proprietary industrial packaged refrigeration systems under the name "EXPERT System." ALTA not only manufactures this equipment but also installs and services these units nationwide, with over 850 units sold to date.

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[1] Additional attachments to the March 31 application submitted with the June 23 supplemental include: the Affidavit of Eric Brown, ALTA Refrigeration (Attachment 1); EXPERT System Leak Rate Calculations (Attachment 2); the March 6, 2025 AIM Act petition submitted by the Coalition for the Use of Safe and Efficient Refrigerants ("CUSER") (Attachment 3); and the compilation of California Ammonia Accidents (Attachment 4).

[2] 2,3,3,3-Tetrafluoropropene, HFO-1234yf, is a hydrofluoroolefin with molecular formula CH_2=$CFCF_3$. As a refrigerant, it is designated R-1234yf and marketed under the names Opteon YF by Chemours and as Solstice YF by Honeywell.

ALTA was formed in 1975 and is currently led by its two owners with a combined experience of more than 50 years in the industry.[3] In 2013, ALTA introduced the EXPERT Refrigeration System as an alternative to the traditional ammonia systems being proposed for new refrigeration facilities. Our industry-leading EXPERT System line delivers unmatched refrigeration performance compared to custom-built ammonia systems, while using no water and having the lowest overall annual power consumption on the market today. Due to the higher GWP nature of synthetics, ALTA has strived to use the lowest GWP refrigerant (currently R-513A with a GWP of 630) without sacrificing safety and sustainability. ALTA has transitioned to meet not only our own environmental goals but continues to meet or exceed our customers' sustainability goals as well.

ALTA's EXPERT units are built with all industrial materials such as semi hermetic compressors and Schedule-40 stainless steel pipe (i.e., no copper or brazed connections which are commonly used in commercial equipment). These systems are pressure tested to 400 psi, which is 2 times the working pressure of the system. The combination of refrigerant and materials of construction significantly lower the overall risk to human health and the environment as it maintains an A1 rating (non-toxic/non-flammable) as well as being the most sustainable solution with zero water usage while providing the lowest annual power consumption available on the market. In addition, because of the materials of construction being used, the EXPERT System has the lowest leak rate in the industry which is less than 1.5% annually (a number previously unheard of in the refrigeration industry).

II. Commitment to Health and Human Safety

It is very important to understand that ALTA Refrigeration has used ammonia for over 50 years. Over this time, ALTA has witnessed as well as been directly involved in accidents where people were significantly injured, stored product was lost, and in the worst cases, individuals lost their lives. The ALTA systems transition the market away from the use of hazardous or inefficient refrigerants, which continue to this day to pose substantial risks. Some cold storage companies have accepted these risks for what they are, but other companies and many jurisdictions in California do not want these associated risks and prefer using safe and efficient A1 (non-toxic/non-flammable) solutions. These risks were in the past generally accepted due to the cost of replacing the refrigerant (primarily leaks after installation) as well as the perception that ammonia systems were the most efficient systems one could install. Those two assumptions are no longer supportable.

ALTA recognizes and acknowledges that HFCs (even those with low GWP) are greenhouse gases that can have negative impacts to human health and the environment. Although ALTA believes that the proper balance of achieving greenhouse gas emissions reductions, safety, and energy efficiency (and associated Scope 2 emissions) is best achieved with its current R-513A based EXPERT systems, ALTA is willing to attempt to transition to using R-1234yf (an A2L HFO refrigerant) now that refrigerant supplies are beginning to be available and California building codes are beginning to be revised to allow A2L chemicals. However, ALTA needs additional time, as requested under this variance application, to re-engineer its EXPERT Systems to use alternative refrigerants with GWP less than 150 (whether R-1234yf or other options) that would be compliance with CARB regulations. ALTA believes any impacts during

[3] 40 of those years were dedicated to designing and installing ammonia refrigeration systems, which gives us intimate insights into the use of ammonia and other refrigerants in cold storage facilities.

the transition period can be minimized and/or mitigated by a combination of managing leak rates, procuring carbon offsets, and mandating end-of-life refrigerant destruction.

III. Misclassification of Cold Storage Warehouses

ALTA firmly believes that cold storage warehouses have been misclassified by both the U.S. EPA and CARB regulations with regard to the applicable GWP limit. CARB has generally classified end-uses with charges in the 100s or 1,000s of pounds under the 750-GWP limit category, while end-uses with charges measured in ounces or pounds are placed in the 150-GWP limit category. Cold storage warehouses clearly belong in the former category, although they have been misclassified and subjected to a 150-GWP limit. ALTA and many other end-users were not aware, or did not appreciate the consequences, of the CARB rulemaking process that set these limits. In an effort to have our voices heard, ALTA has now joined a coalition with a significant number cold storage end users and suppliers to advocate for the use of safe and efficient refrigerants known as the Coalition for the Use of Safe and Efficient Refrigerants (CUSER). The CUSER coalition consists of over 50 companies, many of which operate in California, representing a core element of the "cold chain" that provides fresh, affordable food to 340 million Americans and serve the food, pharmaceutical, health care, cosmetics, biotechnology, chemical, retail, agriculture, and other sectors in this country and our markets abroad.

IV. Conclusion

Thank you for your consideration of ALTA's application for a variance for cold storage warehouse cooling systems that are critical to California's cold chain and food prices. Please contact me if you would like to discuss any aspect of ALTA's variance application or these materials.

Sincerely Submitted,

Eric Brown, P.E
President | Principal
ALTA Refrigeration
Peachtree City, GA30269

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VARIANCE APPLICATION

Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Stationary Air-conditioning, and Other End-Uses.

Application for a Variance from the requirements of California Code of Regulations, Title 17, sections 95374 and 95375.

Note: the requirements for a variance application are listed in California Code of Regulations, Title 17, section 95378, Use of this application template is optional.

A. **Name of applicant:** ALTA Refrigeration, Inc.
Ownership status (e.g., parent, subsidiary): Georgia LLC
Address: 403 Dividend Drive, Peachtree City, GA 30269
Telephone number: (678) 554-1100
E-mail address: alta@altarefrigeration.com

B. **Please describe your business activity or product description.**

Self-installing manufacturer of refrigeration equipment (EXPERT Refrigeration System).

C. **Please describe your relationship to the product.**

Manufacturer of product as well as installer and facility O&M.

D. **List the specific section(s) of the regulation from which a variance is being requested.**

Requesting a variance for Section 95374(c) Table 3 New Refrigeration Equipment, Stationary (in New Facilities) Cold Storage Warehouses.

E. **Provide an explanation and description of the reasons for seeking a variance.**

ALTA recognizes and acknowledges that HFCs (even those with low GWP) are greenhouse gases that can have negative impacts to human health and the environment. Although ALTA believes that the proper balance of achieving greenhouse gas emissions reductions, safety, and energy efficiency (and associated Scope 2 emissions) is best achieved with its current R-513A based EXPERT systems, ALTA is willing to attempt to transition to using R-1234yf (an A2L HFO refrigerant) now that refrigerant supplies are beginning to be available and California building codes are beginning to be revised to allow A2L chemicals. However, ALTA needs additional time, as requested under this variance application, to re-engineer its EXPERT Systems to use alternative refrigerants with GWP less than 150 (whether R-1234yf or other options) that would be compliance with CARB regulations. ALTA believes any impacts during the transition period can be minimized and/or mitigated by a combination of managing leak rates, procuring carbon offsets, and mandating end-of-life refrigerant destruction.

Due to the limited choice of refrigerants that can be used in Cold Storage Warehouse applications, ALTA Refrigeration is requesting a variance for one (1) additional refrigerant. We are seeking a variance to follow the same GWP guideline as Chillers, Air Conditioning, and Data Centers. ALTA is requesting a variance for the lowest allowed GWP of 750 GWP (see Table 1). Please note that the highest allowed GWP per this table is 2,200 GWP. We are seeking this variance due to the inherent issues with refrigerants with a GWP less than 150 such as flammability, toxicity, high pressure, and/or efficiency. Anything classified above classification 1 (flammable) is problematic for local first responders, end users, and companies that service this equipment. In addition to this, there is a trigger clause in California legislation AB 209 Chapter 251 Sec. 8. 18944.21 that states "effect July 1st , 2024, no state or local building code provision shall prohibit the use of a refrigerant listed as acceptable under Section 761k of the Federal Clean Air Act (42 U.S. Provide an C. Sec. 7401 et seq.), provided each use is installed in accordance with the most recent version of ASHRAE Standard 15 and the applicable listing standard, such as UL 60335-2-89 or UL 60335-2-40."

Table 1: Accepted GWP Thresholds by General End-Use

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Chillers – Air-conditioning	Chillers (new)	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2024
Chillers – Industrial Process Refrigeration	Chillers (new) designed for chilled fluid leaving thechiller at temperatures > +35 °F (2 °C)	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2024
Chillers – Industrial Process Refrigeration	Chillers (new) designed for chilled fluid leaving thechiller at temperatures ≤ +35 °F (2 °C) -and > -10 °F (-23 °C)	Refrigerants with a GWP of 1,500 or greater	Prohibited as of January 1, 2024
Chillers – Industrial Process Refrigeration	Chillers (new) designed for chilled fluid leaving thechiller at at temperatures ≤ -10 °F (-23 °C) and > -58 °F (-50 °C)	Refrigerants with a GWP of 2,200 or greater	Prohibited as of January 1, 2024

Specific End-Use	Prohibited Substances	Effective Date
Room/wall/window air-conditioning equipment, PTACs, PTHPs, portable air-conditioning equipment, and residential dehumidifiers (new)	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2023
Other air-conditioning (new) equipment, residential and non-residential	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2025
Variable Refrigerant Flow (VRF) system (new)	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2026

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Cold storage warehouses	Refrigeration equipment (new), containing more than 50 pounds refrigerant	Refrigerants with a GWP of 150 or greater	Prohibited as of January 1, 2022

Requested Variance to follow other refrigerated

F. Identify what type of variance is being requested:

☒ **Impossibility** (the Applicant exercised best efforts but still was unable to comply with the regulatory requirements of the regulation for reasons beyond his or her control despite exercising foresight to prevent the noncompliance.)

☐ **Force Majeure Event** (a sudden and unforeseeable event involving a clear danger, demanding action to prevent or mitigate the loss of, or damage to, life, health, property, or essential public services, arising from causes beyond the control of the Applicant, which

delays or prevents the performance of any obligation under the regulation, despite the Applicant's best efforts to fulfill the obligation. This includes events where the local government, State of California, or federal government issues a declaration of emergency, such as war, wildfires, floods, hurricanes, tornadoes, earthquakes, volcanic eruptions, and pandemics. This does not include negligent acts or the Applicant's financial inability to perform that is unrelated to an event as defined in this section.)

☐ **Both Impossibility and Force Majeure Event**

G. If seeking an Impossibility variance please provide clear and convincing evidence demonstrating how all of the following Impossibility variance criteria have been met:

1. A lower risk substitute is not currently or potentially available.

ALTA originally designed and built systems that used ammonia (NH3) for over 40 years. Due to the safety issues, ALTA stopped offering these systems in 2020. ALTA also considered CO_2, but CO_2 has technical deficiencies such as safety concerns due to high pressures as well as power inefficiencies and reliability. Because of this, ALTA developed a package to effectively use synthetic refrigerants down to a GWP of 630 that are neither toxic nor flammable (A1 classification). Besides CO_2 (which has inherent issues), there are no other A1 refrigerants (non-toxic / non-flammable) that are below the proposed 150 GWP that are currently available or even viable. As a result, ALTA is requesting a variance for the use of 513a since it is the best substitute to meet these requirements.

2. An exemption will not increase the overall risk to human health or the environment.

ALTA's EXPERT units are built with all industrial materials such as semi hermetic compressors and schedule 40 stainless steel pipe (no copper or brazed connections which are commonly used in commercial equipment). The system is pressure tested to 400 psi which is 2 times the working pressure. ALTA recognizes and acknowledges that HFCs (even those with low GWP) are greenhouse gases that can have negative impacts to human health and the environment however, the combination of refrigerant being used and the materials of construction significantly lowers the overall risk to human health as well as the environment as it maintains a non-toxic/non-flammable rating as well as being the most sustainable solution with zero water usage and the lowest annual power consumption available on the market. In addition to this, because of the materials of construction used, the EXPERT System has the lowest leak rate in the industry which is less than 1.5% annually (see Attachment 2 leak rate calculations for every unit installed to date – 10 year span).

3. **The Applicant has used best efforts to anticipate and address the impossibility and any potential noncompliance.**

With a 150 GWP restriction, markets (specifically cold storage) are forced to use Toxic, Flammable, Inefficient, or Extremely High Pressure refrigerants in lieu of being able to use Non-Toxic / Non-Flammable (Safe) and Efficient Refrigerants. This is because there are no A1 (Non-Toxic / Non-Flammable) refrigerants below the proposed 150 GWP threshold available except for CO_2, which has Safety / Sustainability concerns (see Table 2). There are options for other industry sectors (such as Chillers, Data Centers, and AC) to still be able to use A1 refrigerants due to the 750 GWP threshold. It is obvious that the 750 GWP threshold was strictly chosen for this reason. The high level of safety,

efficiency, and reliability associated with using A1 refrigerants is critical for EVERY market including Cold Storage Warehouses. This is not only for the safety of the people, but also for the food that is stored.

Table 2: Cold Storage (New Facilities) Refrigerant Options

ASHRAE # (GWP)	Safety[1]	Commercial Availability	Energy Efficiency	Useability / Feasibility
R-717 (ammonia) (GWP 1)	TOXIC/ FLAMMABLE	AVAILABLE	EFFICIENT	NOT FEASIBLE Safety risks (toxicity/flammable).
R–744 CO_2 (GWP 1)	ISSUES [2] (High Pressure)	AVAILABLE	NOT EFFICIENT [3]	NOT FEASIBLE Safety risks (high pressure); low energy efficiency, high operating cost
R-513A [5] (GWP 573)	NO ISSUES	AVAILABLE	EFFICIENT	FEASIBLE
HFO–1234yf (GWP 1)	FLAMMABLE	AVAILABLE	EFFICIENT	NOT FEASIBLE Similar to R-513, safety risk (flammable)
HFO–1234ze(E) (GWP 1)	FLAMMABLE	AVAILABLE	EFFICIENT	NOT FEASIBLE Similar to R-513, Requires significantly higher compressor displacement safety risk (flammable)

[1] Group classification, ASHRAE Standard 15, Safety Standard for Refrigeration Systems, and 15.2, Safety Standard for Refrigeration Systems in Residential Applications.

[2] Not Toxic or Flammable, but extremely high pressure.

[3] Transcritical CO_2 systems are not efficient when compared to other systems that do not operate at transcritical temperatures/pressures

H. If seeking a Force Majeure Event variance please provide clear and convincing evidence demonstrating how all of the following Force Majeure variance criteria has been met:

1. **Non-compliance is due to a Force Majeure event.**

   N/A

2. **The Applicant has used best efforts to anticipate and address any force majeure event and any potential noncompliance, including minimizing any adverse effects of the greenhouse gas emissions related to noncompliance.**

   N/A

I. Please attach supporting documentation for attributing noncompliance to Impossibility or a Force Majeure Event. Supporting documentation must be written in English. Please list the supporting documentation that is attached to this application.

The attached affidavit of Eric Brown, President of ALTA Refrigeration (see Attachment 1), describes comprehensive efforts that ALTA made to transition to low-GWP refrigeration for its cold storage warehouse systems designs prior to California's new F-gas regulations. As a result of this process, ALTA landed on low-GWP R-513A which it determined best prioritized and balanced public health and safety and environmental impacts. After ALTA had already re-designed its systems, CARB promulgated its F-gas regulations and imposed the 150-GWP cap, which effectively bans any refrigerant except for toxic, flammable, high-pressure refrigerants, or emissions-intensive and water-intensive systems. At the time CARB promulgated its 150-GWP regulation in 2022, there was little or no data on R-1234yf in large-scale applications such as cold storage warehouses and HFO products were not commercially available in the refrigerant market. Those limitations are still largely barriers to adoption of HFO systems; however, ALTA is committed to working through those challenges during the 18-month variance period now that some quantities of R-1234yf are being sold, although at exorbitant prices due to market shortages.

J. Provide a description of all efforts made to timely fulfill the requirements of the section(s) from which a variance is being requested.

The attached affidavit of Eric Brown, President of ALTA Refrigeration, describes how ALTA has over the last decade been a pioneer in transitioning its designs for its cold storage warehouse systems to low-GWP refrigerants, primarily using R-513A, which is the lowest GWP A1 (non-flammable) synthetic refrigerant available in the market. ALTA has determined that R-513A results in the best balance of public health and safety, and lowest lifecycle greenhouse gas footprint for cold storage facility applications compared to other available refrigerants.[4]

However, even with its low GWP of 630, R-513A is now prohibited by CARB's F-gas regulations as it is above the 150-GWP limit for the cold storage warehouse sector. ALTA has previous expressed to CARB that the cold storage sector is mis-categorized under CARB's regulations in the 150 GWP category, as cold storage facilities require large industrial-scale cooling systems with 1000's of pounds of refrigerant charge no matter what refrigerant is used. We have attached a copy of the recent March 6, 2025 AIM Act petition submitted by the Coalition for the Use of Safe and Efficient Refrigerants ("CUSER") (see Attachment 3) asking the U.S. EPA to re-categorize the cold storage sector to the more appropriate 700-GWP category, similar to other industry sectors, which would allow the continued use of R-513A refrigerant. ALTA has also previously described its reluctance to use ammonia for its cold storage systems due to increasing concerns about the dangers of using toxic and flammable chemicals in large systems. Similarly, ALTA has previously shown that other alternative refrigerants such as CO_2-based systems are not practical for large cooling systems, and perversely have a larger carbon footprint impact than low-GWP HFC/HFO blends due to the significantly higher electric power demands of CO_2 systems and associated indirect greenhouse gas emissions.

[4] ALTA notes that just last year, CARB approved a variance for LG Electronics for consumer dehumidifiers where R- 513A was identified as a potential 700-GWP category refrigerant and LG was given a variance to transition to R-32 (GWP 675).2 Cold storage warehouses are obviously thousands of times larger than humidifiers, and cannot use flammable A2Ls such as R-32 – but cold storage should at least be allowed to use R-513A in the same 700 GWP HFC category as small appliances.

Until recently, so-called next-generation HFO chemicals such as R-1234yf have not been commercially available in the refrigerant market. Even today, HFO products are experiencing severe shortages, price markups, and equipment manufacturing disruptions, which is fomenting a national debate over the future workability of the AIM Act and other technology forcing government regulations which have proven unresponsive to market realities. In addition, as described in its application, ALTA remains concerned about the flammability rating of R-1234yf and other HFOs, as well as the uncertainty around whether such refrigerant gases will be accepted by local building code authorities in quantities required for cold storage warehouses. For these reasons, ALTA had not previously undertaken the extensive steps required to re-design its systems for flammable-rated HFO gases. Nor to ALTA's knowledge has any other manufacturer of cold storage cooling systems offered an HFO-based system other than at an experimental scale.[5]

Nonetheless, given CARB's insistence that the 150-GWP must be met, ALTA is committing to undertake an engineering re-design of its proprietary EXPERT cold storage systems to accommodate R-1234yf as a heat transfer fluid to substitute for the safer and more practical R- 513A currently used in EXPERT systems for the California market. ALTA expects that the process to re-design the engineering, establish specifications, source components, test and evaluate the systems, will take at least 18 months. The details of this process are spelled out in the Compliance Plan (see Section L).

K. Please provide the length of the variance requested as well as the earliest date when compliance will be achieved.

ALTA is proposing an 18-month variance until December 31st, 2026 in order to re-engineer its EXPERT cold storage refrigeration systems to utilize R-l234yf HFO refrigerant. This time is also necessary to review data on R-1234yf system field performance which is reportedly being generated under various CARB-funded pilot projects. This time is also justified by the fact that flammable A2L refrigerants are only recently being allowed by building codes and the re-engineered systems must be designed to meet these evolving code standards (see Section L).

L. Provide a compliance plan which describes in detail how, if a variance is granted, compliance will be achieved as expeditiously as possible including all of the following:

1. The method by which compliance will be achieved

ALTA is proposing an 18-month variance in order to re-engineer its EXPERT cold storage refrigeration systems to utilize R-1234yf HFO refrigerant. This time is also necessary to review data on R-1234yf system field performance which is reportedly being generated under various CARB-funded pilot projects.[6] This time is also justified by the fact that flammable A2L refrigerants are only recently

[5] In the May 23, 2025 telecon, CARB staff indicated that several cold storage facilities in California had been built using HFOs or CO_2 systems. We would welcome additional information about these facilities. Based on market information, it is our understanding that all or most of the facilities identified by CARB have not in fact been built and are to the contrary being re-designed as ammonia systems.

[6] ALTA requests that CARB provide any available data from larger refrigeration systems using R-1234yf or other A2L HFO blends. On a recent telecon, CARB referenced a list of F-gas Reduction Incentive Program ("FPIP") funded projects which it anticipated would use HFO blends. Based on market information, ALTA believes that these projects are not actually using HFO blends or CO_2 systems, but are reverting to ammonia systems due to technical challenges. However, ALTA would welcome any field data CARB has on HFO or CO_2 system performance, efficiency, and safety.

being allowed by building codes and the re-engineered systems must be designed to meet these evolving code standards.

Re-engineering the EXPERT systems to accommodate R-1234yf will require the following steps and timelines:

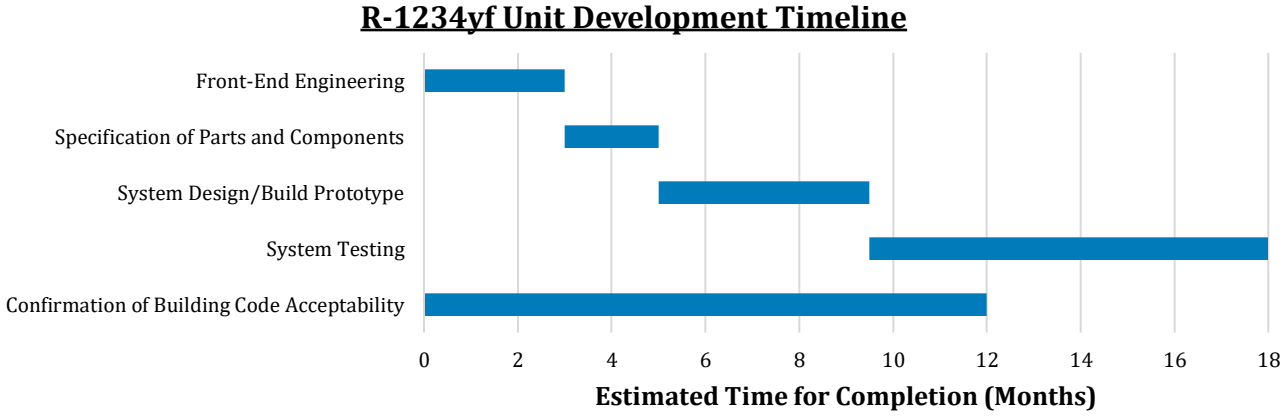
- Front-end engineering:
    - Preliminary analysis to identify existing constraints and determine the functional requirements introduced by the R-1234yf;
    - Establish the technical and operational goals for the re-engineered EXPERT system, including site evaluations and initial modeling;
    - Develop software models to predict performance characteristics and design limitations;
    - Re-engineer evaporator size, circuiting, pressure drop impacts, etc.;
    - Evaluate materials compatibilities with refrigerant;
    - Evaluate oil compatibility and miscibility characteristics with refrigerant;
    - Evaluate compressor performance characteristics available;
    - Evaluate compressor power requirements;
    - Evaluate compressor discharge temperature limits; and
    - Re-engineer condenser size circuiting and pressure drop.
- Specification of parts and components:
    - Based on system requirements, identify and specify any new parts and components needed to support the transition to R-1234yf that will have to be sourced or manufactured; and
    - Ensure compatibility with the broader system architecture, performance objectives, supply chains, and manufacturing capabilities.
- Confirmation of building code acceptability:
    - Review recent and proposed changes for compliance with local, state, and national building codes, industry standards, and safety regulations; and
    - Where necessary, coordinate with CARB to obtain approval of modifications.
- System design:
    - Updating schematics, control strategies, and integration plans;
    - Model R-1234yf system behavior under different conditions, and “stress test” new design;
    - Develop manufacturing/assembly drawings and processes; and
    - Develop procedures for fabrication, installation, and commissioning.

- Build prototype:
    - Test System under varying temperature conditions (Summer, Spring/Fall, Winter) and review of anticipated performance metrics.
- Confirmation of building code acceptance:
    - Engage customer(s) and local building authorities to review any "large scale" cold storage warehouse installations. This includes any technical presentations, demonstrations, state and local building code discussions/evaluations, and review of anticipated performance metrics as compatible with customer expectations.

2. Milestone dates

Re-engineering EXPERT systems for compatibility with R-1234yf will take 18 months at the very earliest, with general timelines described below and illustrated in the embedded Gantt chart:

- Front-end engineering: **12 weeks**
- Specification of parts and components: **8 weeks**
- System design & Build Prototype: **18 weeks**
- System Testing: **40 weeks**
- Confirmation of building code acceptability (evaluating any "large scale" cold storage warehouse installations using 0 GWP HFOs : **52 weeks** (concurrent with overall timeline)



The 18-month trajectory is necessitated by the fact that until recently flammable A2L-rated HFO refrigerants were illegal in many California jurisdictions. Only recently in 2022 did the California legislature pass AB 209, which pushed down a regulatory mandate on state and municipal building codes that banned prohibitions on SNAP-approved refrigerant substitutes.[7] Only more recently in April 2023 did the California State Fire Marshal adopt changes to California code standards that

[7] 2022 Cal. Legis. Serv. Ch. 251 (A.B. 209) Energy and Climate Change (passed Sept. 6, 2022), codified at Cal. Health & Safety Code § 18944.21.

partially implemented AB 209.[8] ALTA has been informed that R-1234yf systems will over time be allowed by local permit officers, although this is not yet being seen in practice.

ALTA is willing to accelerate this timeline if CARB is able to share available data on R-1234yf that shows it is a viable substitute to R-513A for comparable large-scale refrigeration systems (≥1,000 lb. charge).

3. Milestone achievements

ALTA already completed a transition to low-GWP refrigerant R-513A (GWP 630) for its cold storage refrigeration systems as a voluntary initiative to move away from R-134a (GWP 1,430) and previously R-507 (GWP 3,985), which ALTA began before CARB's 150-GWP regulations. ALTA anticipates establishing a benchmark for R-1234yf systems by July 1st, 2026. If R-1234yf is confirmed by its engineering studies as a viable substitute, then ALTA anticipates that it can switch completely to R-1234yf for new California systems by December 31st, 2026.

ALTA will continue to monitor market availability of new refrigerant chemicals and evaluate any potential A1 substitute refrigerants with <150 GWP for adoption into its system designs, as such substitutes may become available in the market in the future.

M. Provide a description of the damage or harm that will result to the Applicant from immediate compliance with the regulatory requirements, including if compliance would result in an extraordinary economic hardship, such as closure of the entire facility or loss of a large portion or the revenue:

Unfortunately, this has the most negative impact on Californians because applicant would be limited to offering customers a "sub-standard" (non A1) solutions that:

- Sacrifices Life Safety:
  - First Responders
  - Local Community
  - End Users (personnel and product)
  - Technicians that work on these systems
- Sacrifices Sustainability to achieve GWP < 150 systems that:
  - Use more power
  - Use more water
  - Cost much more to operate (replacement parts / resources).

There would be loss of business for ALTA in California due to the fact that ALTA cannot offer the EXPERT System as an A1 solution.

ALTA reasserts its concern that Cal. Code Regs. tit 17 § 95374(c), which establishes a 150 GWP limit for refrigerants used in cold storage warehouses, does not leave the cold storage industry with a viable efficient, non-toxic and non-flammable refrigerant choice. As previously noted, CARB allows

[8] California Building Commission, *Initial Statement of Reasons for Proposed Building Standards of the State Fire Marshal Regarding the 2022 California Mechanical Code*, pp. 31-32 (April 2023).

facilities in other sectors with similar charge size and performance demands, such as data centers, to utilize refrigerants under a 750 GWP limit, which would allow the continued use of R-513A (GWP 630), as currently used by ALTA's EXPERT systems for cold storage warehouses. The disparate treatment of the cold storage sector is not based on any scientific or rational basis other than the assumed availability of conventional ammonia systems which continue to be plagued by safety concerns and accidents in California and across the country.

CARB's 150 GWP limit as a practical matter forces the food supply chain to choose between toxic ammonia, inefficient transcritical CO_2 systems with a higher GHG footprint than R-513A, or HFOs like R-1234yf rated as a hazardous flammable A2L gas that raise safety and liability concerns. CARB should consider regulatory revisions to § 95374(c) to consider these important safety and efficiency considerations, or alternatively, CARB should immunize cold storage warehouses that are forced to use toxic, flammable, or extremely high pressure refrigerants from public and private liability for personal injury, property damage, and code compliance resulting from CARB's regulatory mandate.

In addition, to the extent CARB is promoting the use of ammonia or A2L systems, the volume of refrigerant charge in cold storage warehouses is so large that the facility will be subject to Process Safety Management procedures under the federal OSHA and Clean Air Act programs, which add considerable additional capital and O&M costs. Even under the PSM precautions, ammonia and flammable A2Ls remain classified as hazardous to workplace and community populations, and ALTA does not want to be mandated to expose local communities, first responders, customers that own and operate these facilities, as well as their own employees to these refrigerants until they are proven safe in practice.

N. If applying for an Impossibility variance please provide quantification of current Greenhouse Gas (GHG) emissions resulting from normal business-as-usual operations as it directly relates to the continued use of any substance in end-uses listed in Table 1, section 95374 (a); Table 2, section 95374 (b); Table 3, section 95374 (c); or Table 4, section 95374 (d). This includes quantification of the direct GHG emissions resulting from refrigerant leaks or HFC emissions and indirect GHG emissions resulting from energy use (where applicable), with all calculations, based on the average lifetime of the equipment or product that will continue to use prohibited substances. Applicant must include all calculations used to calculate GHG emissions estimates, including emission factors (i.e., charge size as defined in section 95373, leak rate as defined in 40 C.F.R. Part 82.152, and refrigerant used over the average lifetime of the equipment, system, or product). Please see the bottom of this application template for an example calculation.

- ALTA EXPERT GHG Annual Emissions (Direct Emissions)[9]
    - *Total Annual GHG Emissions (Per Unit):*
      1,500 lbs. R-513A × 1.5% leak rate × 630 GWP = 14,175 lbs. CO_2e or 6.43 $MTCO_2e$
    - *Total Annual GHG Emissions (Per Warehouse):*
      8 Units Per Warehouse × 6.43 $MTCO_2e$/Unit = 51.44 $MTCO_2e$

[9] Conversion to Metric Tons: 2,204.62 lbs. CO_2e = 1 $MTCO_2e$

- *Total End-of-Life GHG Emissions (Per Warehouse):*
  1,500 lbs. Refrigerant × 630 GWP × 8 Units = 3,429.16 $MTCO_2e$
  3,429.16 $MTCO_2e$ – 3,429.16 $MTCO_2e$ destroyed = 0 $MTCO_2e$

- Warehouse Energy Annual Consumption (Indirect Emissions)
  - *Total Annual Energy Emissions for (Per Unit):*[10]
    $1{,}058{,}331\ \text{kWh} \times \left(3.94 \times 10^{-4}\ \frac{\text{MTCO}_2\text{e}}{\text{kWh}}\right) = 416.98\ \text{MTCO}_2\text{e}$
  - *Total Annual Energy Emissions for (Per Warehouse):*
    8 Units Per Warehouse × 416.98 $MTCO_2e$/Unit = 3,335.84 $MTCO_2e$

O. Provide a description of any negative impacts to human health or the environment that may result from the granting of a variance.

ALTA recognizes and acknowledges that HFCs (even those with low GWP) are greenhouse gases that can have negative impacts to human health and the environment. ALTA believes any such impacts can be minimized and/or mitigated by a combination of managing leak rates, carbon offsets, and refrigerant recovery and recycling.

Per the attached affidavit of Eric Brown, President of ALTA Refrigeration (see Attachment 1), describing how ALTA's low-GWP designs for its cold storage warehouse systems maximize public health benefits by using the lowest-GWP non-toxic, non-flammable synthetic refrigerant currently available in the market. As described in this submission, the ALTA systems transition the market away from the use of hazardous or inefficient refrigerants, which continues to pose substantial risks. The ALTA systems also maximize environmental benefit compared to CO_2 systems by avoiding excessive electricity energy demand needed by CO_2 systems, which results in greater scope 2 emissions and a larger climate footprint on a lifecycle basis. As described in the Mitigation Plan (see Section P), ALTA will invest in carbon offsets to zero out any modest increased greenhouse gas emissions associated with use of R-513A during the variance period. Once the transition to R-1234yf is made after the variance period, direct greenhouse gas emissions will be virtually eliminated although there will be residual risk to human health stemming from the A2L flammability rating of HFO chemicals, but this is a risk inherent in the CARB regulations not by ALTA's design.

As discussed, this variance significantly lowers the overall risk to human health and the environment as it allows the use of safe and efficient R-513A during the variance period with minimal greenhouse gas emissions which will be fully offset. While R-513A has GWP higher than the current 150-GWP limit, it does not pose the same risks to human health as ammonia, thus offering significant public health and safety benefits. The difference in greenhouse emissions resulting from the relatively higher GWP are negligible compared to a hypothetical CO_2 system and much lower than other systems still allowed to use legacy refrigerants. The somewhat greater greenhouse gas emissions compared to 150-GWP systems will be offset through investment in carbon offset credits, as discussed in the attached Mitigation Plan. In addition, as shown in ALTA's mitigation plan (see Part P), the use of R-513A has

[10] Assuming unit is continuously running a -10°F space at 60 tons of refrigeration per year. Carbon dioxide produced per kilowatt-hour in U.S. https://www.eia.gov/tools/faqs/faq.php?id=74&t=11; Emission factors from https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/casnap/isorappb.pdf.

significantly lower power consumption (and indirect greenhouse gas emissions) and dramatically lower water consumption than CO_2 systems.

ALTA has provided data in Attachment 2 showing that EXPERT systems have an average leak rate of 1.5% percent, with many systems having no leaks at all. This data has been compiled from approximately 650 systems operating under a variety of conditions across 27 states and Mexico, with some systems having been in service for nearly a decade. Accordingly, the negligible quantity of emissions from the EXPERT systems do not pose a great threat to human health and the environment, but ALTA anticipates mitigating, if not completely avoiding, any such emissions through the purchase of carbon offsets, as discussed in Part P.

Additionally, ALTA manages these leak rates through its position as the authorized service provider of all EXPERT systems it installs. ALTA offers a lifetime warranty to its customers that is voided if any company other than ALTA performs any work on units ALTA installed. As a result, 99% of ALTA's customers continue to use ALTA as their primary service provider, including any decommissioning of equipment. End-of-life emissions will be offset by the reclamation and destruction of refrigerant during the decommissioning of the unit.

However, ALTA recognizes and acknowledges that HFCs (even those with low GWP) are greenhouse gases that can have negative impacts to human health and the environment. With regard to ALTA's EXPERT Refrigeration product, any such impacts can be minimized, if not completely avoided through offsets. Accordingly, we have quantified excess GHG emissions compared to a 150-GWP hypothetical refrigerant for purposes of comparison based on a typical cold storage warehouse. ALTA estimates that 4-5 new cold storage facilities could be built in California within the planning horizon. If mitigation is mandated by CARB, each cold storage warehouse could purchase carbon offsets to zero out this impact. At an estimated cost of $20 per metric ton of offset, the mitigation cost could be $783.80 per warehouse which reflects the modest impact on the atmosphere and zeros out all impacts, see Section P.

P. Provide a mitigation plan that demonstrates how you will reduce excess GHG emissions to a level equal to or below what would have been emitted had you been in compliance and how you will mitigate any negative impacts to human health or the environment. You must include all calculations used to calculate GHG emission estimates including emission factors (i.e., charge size as defined in section 95373, leak rate as defined in 40 C.F.R. Part 82.152, and refrigerant used over the average lifetime of the equipment, system, or product). This may include an analysis of prohibited substances, efforts to reduce leaks or venting of prohibited substances, and options to recycle or destroy high-Global Warming Potential refrigerants.

ALTA provided calculations in Part N of this application quantifying greenhouse gas emissions from leakage and energy use at a typical cold storage warehouse using the EXPERT R-513A system as a basis for illustrating the comparative lifecycle greenhouse gas emissions associated with transcritical CO_2 systems. Those calculations can be adapted to quantify the additional emissions from using R-513A compared to a hypothetical substitute refrigerant with 150 GWP, calculated here and summarized in Table 3:

- **150-GWP Refrigerant GHG Annual Emissions (Direct Emissions)**
    - *Total Annual GHG Emissions (Per Unit):*
      1,500 lbs. Refrigerant × 1.5% leak rate × 150 GWP = 3,375 lbs. CO_2e or 1.53 $MTCO_2e$

- *Total Annual GHG Emissions (Per Warehouse):*
  8 Units Per Warehouse × 1.53 $MTCO_2e$/Unit = 12.25 $MTCO_2e$
- *Total End-of-Life GHG Emissions (Per Warehouse):*
  1,500 lbs. Refrigerant × 150 GWP × 8 Units = 816.46 $MTCO_2e$
  816.46 $MTCO_2e$ – 0 $MTCO_2e$ destroyed = 816.46 $MTCO_2e$

Additionally, we have provided the affidavit of ALTA President Eric Brown (Attachment 1) discussing the methodology used to quantify leak rates and emissions underlying the EXPERT System Leak Rate Calculations (Attachment 2) which show that the average leak rate of EXPERT systems is 1.5%.

EXPERT units have a calculated life expectancy of 40 years, and whenever EXPERT units are decommissioned ALTA will ensure the recovery and destruction of the refrigerant gas. For clarification, ALTA is not only the manufacturer of the EXPERT Units, but also the installer and "authorized" service provider. All EXPERT Units come with a "lifetime" warranty as long as any work performed on the units is executed by ALTA Refrigeration. Any work that is not performed by ALTA, or "authorized" by ALTA, "voids" the warranty. Because of the extremely high initial capital cost of the units, ALTA has a 99% acceptance rate in customers using ALTA to service the equipment. This service includes any and all decommissioning of equipment where ALTA would have sole responsibility for reclaiming and destroying any refrigerants at end-of-life. Accordingly, end-of-life emissions for purposes of mitigation calculations is zero.[11] Mitigation calculations results are shown in Table 3.

[11] In the scenario comparison, end-of-life emissions in a 150-GWP refrigerant scenario would actually be greater because ALTA would have no obligation to destroy the refrigerant charge on decommissioning and that gas would be reclaimed and resold into the refrigerant market where it would eventually be emitted into the atmosphere.

TABLE 3[12]

	EXPERT R-513A	150-GWP SUBSTITUTE	DELTA
LEAK RATE EMISSIONS	51.44 $MTCO_2e$	12.25 $MTCO_2e$	+ 39.19 $MTCO_2e$
END-OF-LIFE EMISSIONS	0* $MTCO_2e$	816.46** $MTCO_2e$	- 816.46 $MTCO_2e$
ENERGY EMISSIONS[13]	3,335.81 $MTCO_2e$	3,335.81 $MTCO_2e$	+/- 0 $MTCO_2e$
TOTAL GHG EMISSIONS	3,387.25 $MTCO_2e$	4152.27 $MTCO_2e$	- 756.02 $MTCO_2e$

* ALTA is committed to gas recovery and destruction at end-of-life for all units.

** Assuming emissions if entire one time charge released through resale into refrigerant market at end-of-life, see below calculations.

Additional GHG emissions from using a hypothetical 150-GWP refrigerant instead of R-513A (630 GWP) are estimated at 39.19 $MTCO_2e$ per warehouse per year, not considering end-of life emissions. If end-of-life emissions are considered, use of R-513A combined with end-of-life destruction is actually 756.02 $MTCO_2e$ lower than the 150-GWP scenario. In order to fully mitigate additional emissions associated with the variance, the warehouse facility owner could purchase carbon offsets from a reputable carbon registry to zero out any difference in lifecycle greenhouse gas emissions impact from the proposed variance.[14] At an assumed cost of $20/ton, the cost of this mitigation strategy would be $783.80 for the warehouse per year.

Q. Provide a detailed explanation of efforts that may be implemented to curtail noncompliance in lieu of obtaining a variance.

Per the attached affidavit of Eric Brown, President of ALTA Refrigeration, (see Attachment 1) describing ALTA's extensive efforts to research the market, identify, evaluate and test all available substitute refrigerants, and design an industrial cold storage system that delivers maximum environmental benefits while maximizing safety and minimizing energy-related greenhouse gas emissions. To this point, ALTA has not seen definitive data proving out the use of R-1234yf for industrial-scale cold storage systems, as suggested by CARB staff. However, as discussed in this submission, ALTA is prepared to design a version of its EXPERT cold storage system to meeting California standards using

[12] Based on annual GHG emissions from a hypothetical cold storage warehouse using the ALTA EXPERT System. Assumes 8 EXPERT refrigeration units per warehouse using R-513A (GWP 630) compared to hypothetical warehouse using HFC refrigerant with 150 GWP per California regulations.

[13] Varying estimates of grid power emissions are available but do not affect the calculation as indirect emissions are assumed to be the same for both scenarios.

[14] The cold storage facility would select an appropriate offset category to acquire for mitigation purposes. One logical possibility would be American Carbon Registry METHODOLOGY FOR THE QUANTIFICATION, MONITORING, REPORTING, AND VERIFICATION OF GREENHOUSE GAS EMISSIONS REDUCTIONS AND REMOVALS FROM CERTIFIED RECLAIMED HFC REFRIGERANTS (VER 1.2) (Aug 2021).

R-1234yf in order to establish a benchmark and generate data that can be compared to current R-513A EXPERT systems.

R. **By signing below, you (the Applicant) certify under penalty of perjury that you are a Responsible Official with full authority to submit the application and implement any provision of an Executive Order, and that all information provided is true and accurate to the best of your knowledge, after conducting due diligence. (Applications without this certification will be automatically denied.)**

Signature

7/16/2025
Date

S. **This application and documentation relating to the variance to is being submitted to CARB at the following email address:**

HFCREDUCTION@ARB.CA.GOV

T. **Any Applicant submitting information to the Executive Officer You may claim information as "confidential" by clearly identifying it as "confidential." Any claim of confidentiality must be based on your belief that the information marked as confidential is either trade secret or otherwise exempt from public disclosure under the California Public Records Act (Government Code, section 6250 et seq.). All such requests for confidentiality shall be handled in accordance with the procedures specified in California Code of Regulations, title 17, sections 91000 to 91022.**

Attachment 1

AFFIDAVIT OF ERIC BROWN, ALTA REFRIGERATION

I, Eric Brown, hereby declare the following under penalty of perjury:

1. This affidavit is submitted to support the variance application submitted by ALTA Refrigeration ("ALTA") on March 31, 2025, seeking adjustment to CARB's 150-GWP limit on cold storage facilities in California using ALTA's proprietary EXPERT cooling system product, which have been redesigned to use low-GWP HFCs under 700 GWP.

2. I am over the age of eighteen, and competent to testify about the following facts based on my personal knowledge.

3. I am the President of ALTA Refrigeration, based in Peachtree City, Georgia.

4. ALTA is a designer and builder of refrigeration systems for industrial cold storage warehouse facilities using ALTA's proprietary market leading "EXPERT System" refrigeration systems across America.

5. ALTA was originally founded in 1975 and has been designing and installing industrial refrigeration systems for 50 years.

6. ALTA's two owners both hold BSME engineering degrees from Purdue University and have over 50 years of experience between them. In addition, ALTA has a team of engineers and support staff with decades of collective experience.

7. Cold storage facilities are a core element of the refrigerated "cold chain" that provides fresh, affordable food to 340 million Americans in this country and our markets abroad. Cold storage facilities support the food, pharmaceutical, health care, cosmetics, biotechnology, chemical, retail, agriculture, and other sectors.

8. Cold storage warehouses must reliably maintain temperatures from -20°F to 55°F for refrigerated and frozen storage.

9. In order to achieve these temperatures, cold storage refrigeration systems use 1000's of pounds of refrigerant charge

10. Prior to California's efforts to reduce short lived climate pollutants, including F-gases such as HFCs, cold storage facilities traditionally used CFCs, HCFCs and high-GWP HFCs such as R-134a (GWP 1,430), R-404A (GWP 3,922), R-410A (GWP 2,088), and R-507C (GWP 3,985). Many cold storage facilities also use ammonia systems (GWP 0), but the industry – led by ALTA and its customers – has been moving away from ammonia due to its inherent hazards, which includes toxicity, flammability, as well as a history of industrial accidents. Because of those inherent hazards ALTA initially transitioned to a synthetic A1 refrigerant R-507 (GWP 3,985).

11. Due to the climate impacts of higher-GWP refrigerants, ALTA began transitioning to lower-GWP refrigerants about ten years ago. After extensive research and design work looking at all available refrigerant gases available for industrial cooling applications, ALTA then transitioned to R-134a (GWP 1,430) as a basis for its cooling systems.

12. As discussion began regarding California's adoption of HFC regulations and passage of the federal AIM Act, ALTA looked extensively at even deeper GWP reductions and identified R-513A (GWP 630) as the basis for its current EXPERT refrigeration system design.

13. ALTA was surprised when California chose to categorize cold storage facilities the same as small appliances subject to a 150-GWP cap and not like similar sectors with a 700-GWP cap.

14. Using the EXPERT low-GWP system, ALTA has already transitioned its products and its warehouse customers throughout the United States to significantly reduce the greenhouse gas footprint of the cold chain using low-GWP HFCs that would meet California's HFC limits for comparable industries with large cooling needs, such as data centers.

15. Further, ALTA's EXPERT systems are engineered using the highest quality design and materials to minimize refrigerant leaks. Compared to typical HVAC or commercial systems which are designed primarily for cost and profit margins, the track record for ALTA's installed systems show that leak rates on our EXPERT systems average only **1.5% per year**. The leak rate data provided in Attachment 2 (EXPERT System Leak Rate Calculations) comes from around 650 installed EXPERT systems, operating under a variety of conditions in 27 states and Mexico. The data show how effective the current generation of EXPERT systems are at retaining refrigerant. Even after almost a decade in service, most EXPERT systems lose less than 1.5% of a system's charge annually, with many systems losing none at all. ALTA also offers warranties to its customers guaranteeing any refrigerant loss, which incentivizes ALTA to keep leak rates as low as possible.

16. The leak rate calculations in ALTA's EXPERT System Leak Rate Calculations (Attachment 2) were developed using the following methodology:

a. ALTA's customer contracts typically include maintenance and periodic servicing of the EXPERT refrigeration system by ALTA, including compressors, evaporators and line sets;

b. Servicing is done by EPA-certified service technicians using EPA-certified recovery equipment;

c. ALTA tracks and records the mass of all refrigerant charge added to a system;

d. Following U.S. EPA procedures, the added charge is then compared to the known initial refrigerant charge to calculate the mass of any leaked refrigerant;

e. The leak rate can be calculated mathematically from these data inputs and averaged across all facilities; and

f. The results of these calculations are reported in the EXPERT System Leak Rate Calculations sheet.

17. As shown above, by using state-of-the-art design and high-quality components, ALTA has successfully minimized the greenhouse gas footprint of its EXPERT system through the combination of using a low-GWP, non-flammable HFC/HFO refrigerant blend as the heat transfer fluid and by impressively lowering leak rate, as well as lowering power consumption and eliminating water consumption.

18. CARB's approach in contrast focuses on forcing a transition to non-HFC refrigerant substitutes. However, in the cold storage sector and other large refrigerant charge applications (such as data centers), the United States has reached the limits of existing chemical technology to further reduce the GWP of refrigerants suitable for industrial-scale cold storage at this time.

19. Because CARB's regulations require cold storage warehouses to meet a 150-GWP limit and the federal U.S. EPA has imposed a similar requirement under the AIM Act, ALTA has assiduously researched and evaluated each of the substitute refrigerants identified by CARB and U.S. EPA for refrigeration applications in the 150-GWP category. As shown by the chart included with ALTA's March 31, 2025 variance application (p.13, Table 1), except for R-513A which we currently use in our new systems, there are no synthetic low-GWP substitutes currently available in the market that are A1 (non-toxic/non-flammable) gases, versus ammonia which is both toxic and flammable, or do not actually increase greenhouse gas emissions on a lifecycle basis (in contrast to CO_2).

20. Our research has been based on review of existing engineering and industry sources, literature searches, and dozens of phone calls to chemical manufacturers, including contact with the large fluorinated chemical manufacturers that promised to produce substitutes that CARB and U.S. EPA have identified. We constantly review price sheets and order lists from

multiple wholesale suppliers, and have continuing discussions with industry participants, including our membership in trade associations such as the Air-Conditioning, Heating, and Refrigeration Institute ("AHRI"), Global Cold Chain Alliance ("GCCA"), FMI (formerly the "Food Marketing Institute"), and International Foodservice Distributers Association ("IFDA").

21. As discussed by the Coalition for the Use of Safe and Efficient Refrigerants ("CUSER") in an AIM Act petition pending with U.S. EPA (Attachment 3), their in-house engineering team has explored dozens of different designs using every potentially available refrigerant. All of the HFC, HFO or blend substitutes, or so-called "natural" refrigerants such as ammonia identified as replacements for higher-GWP HFC refrigerants used in the past are either flammable (which creates safety and building code issues), toxic, unavailable in the marketplace, or mechanically unsuitable for cold storage due to the performance characteristics of the particular refrigerant chemical. We have found that R-513A is the best (and only) practical balance of a relatively low GWP (under 700), safety, performance and overall environmental footprint.

22. We are not new to this industry. For many years, ALTA used ammonia in its cold storage systems. But due to the risk of incidents and continued concerns about the toxicity and flammability of ammonia, ALTA began steadily transitioning away from ammonia almost 10 years ago. U.S. EPA has recognized that "ammonia is a toxic gas" that can cause "harmful effects on workers and the public" and that ammonia leaks are more common than some would like to admit. U.S. EPA acknowledges that ammonia is a "fire and explosion hazard at concentrations between 16 and 25%" and notes that the addition of lubricating oil (which is common in refrigeration systems) can create "much broader explosive range," which is especially problematic for cold storage warehouses often found in densely populated urban areas. The troublesome track record of ammonia is well documented and further summarized in ALTA's AIM Act petition.

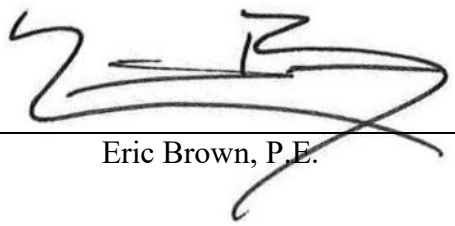
23. Transcritical CO_2 is also unsuitable (by ALTA's engineering and performance standards) for cold storage, despite being accepted by others as a potential solution for smaller applications, due to its technical requirements and higher energy demand. The calculations included in our AIM Act petition and CARB variance application show that on a lifecycle basis CO_2 systems actually result in more greenhouse gas pollution than using R-513A, primarily due to CO_2's higher indirect emissions from electrical demand. In addition to the high power usage, most CO_2 systems also have very high water use, which is particularly problematic in certain areas of the country such as California with water scarcity. ALTA systems save an enormous amount of water compared to CO_2 systems.

24. We have also previously explored the use of R-1234yf, as suggested by CARB staff, and thus far have not seen any evidence that would suggest it is an environmentally preferable alternative to R-513A. However, R-1234yf is additionally problematic because of its classification as a flammable A2L gas, creating safety and liability concerns similar to those posed by ammonia.

25. Although ALTA strongly supports the CARB's efforts to lower the environmental impact of cold storage refrigeration systems, the current 150-GWP limit leaves ALTA stuck without any safe and efficient alternatives compared to our current, state-of-the-art EXPERT systems running on R-513A.

26. I hope that CARB will consider these ALTA concerns and efforts and allow ALTA's EXPERT products a variance from the new cold storage facilities GWP limit.

Executed this day, July 16, 2025, in Peachtree City, GA.

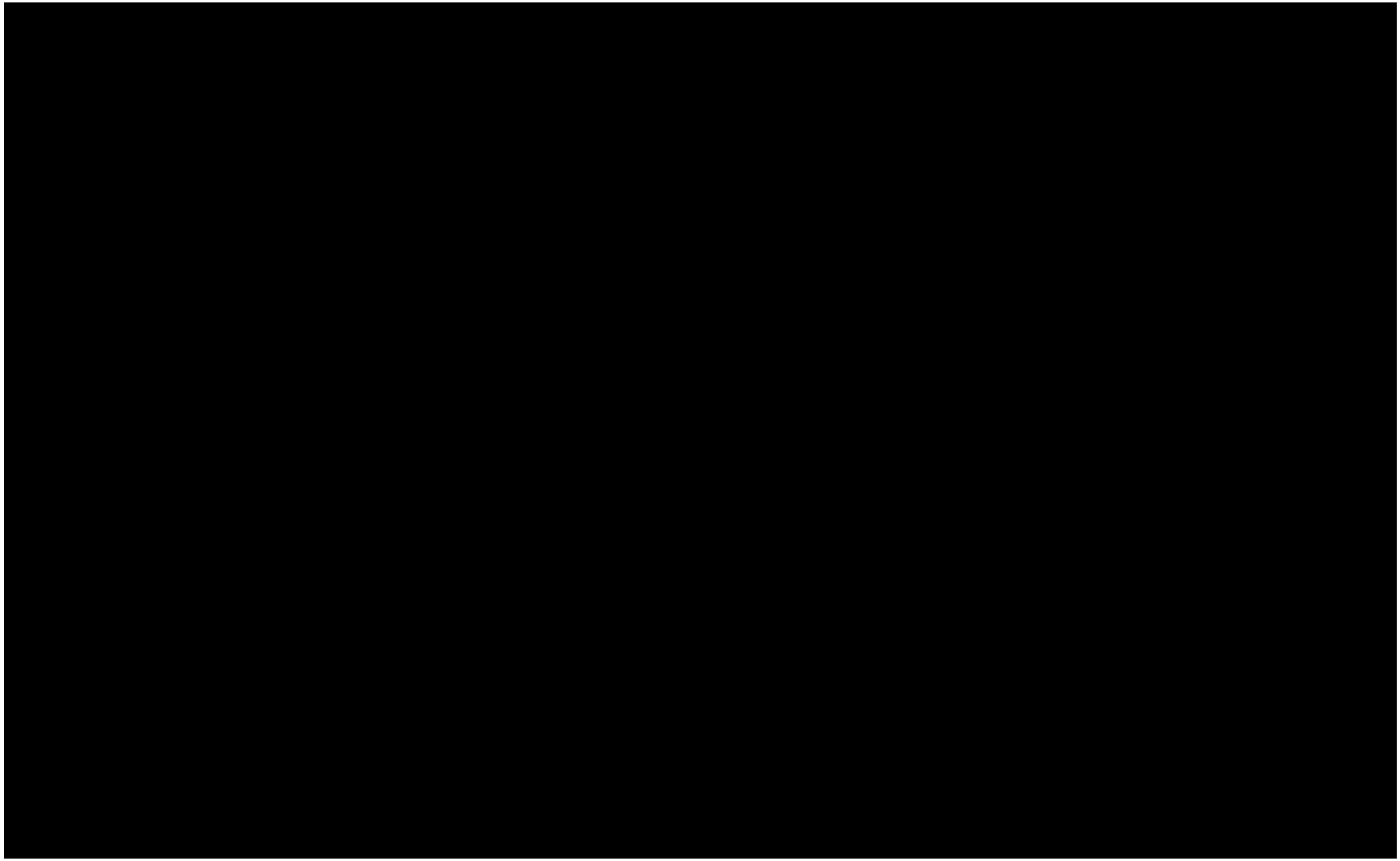


Eric Brown, P.E.

Attachment 2

ATTACHMENT 4 - LEAK RATE (CONFIDENTIAL)

ATTACHMENT 4 - LEAK RATE (CONFIDENTIAL)



Attachment 3

COALITION FOR THE USE OF SAFE AND EFFICIENT REFRIGERANTS

March 6, 2025

Hon. Lee Zeldin, Administrator
U.S. Environmental Protection Agency
1301 Constitution Avenue NW
Washington, D.C. 20004
Attn: Cynthia Newberg, Director
Stratospheric Protection Division
newberg.cindy@epa.gov

Re: AIM Act Petition to Restrict HFC Substitutes Greater than 700 GWP for Cold Storage Warehouses

Dear Administrator:

The Coalition for the Use of Safe and Efficient Refrigerants, Inc. ("CUSER" or "the Coalition") respectfully petitions the U.S. EPA to establish a restriction on the use of hydrofluorocarbons in new cold storage refrigeration units at 700 GWP, rather than 150 GWP as currently established at 40 C.F.R. Part 84.54.

This petition is based on the persistent unavailability of substitutes, prohibitive transition costs, and continued building code complications for the cold storage sector, each of which is greater than originally anticipated by EPA when it established its initial Technology Transition Rule over a year ago in October 2023.[1] This petition requests that EPA increase the GWP limit for HFCs used in cold storage facilities at 40 C.F.R. § 84.54(c)(9) from 150 GWP to 700 GWP. In the alternative, the Coalition requests that EPA allow the continued use of specific identified refrigerants with GWP values up to 700 (including specifically R-513A) in the cold storage sector.

This petition is submitted under the authority of subsection (i) of the American Innovation and Manufacturing Act ("AIM Act"), 42 U.S.C. § 7675(i)(3), and EPA's implementing regulations at 40 C.F.R. § 84.62.[2] The Coalition requests that EPA promptly grant its petition and revise its existing rules as quickly as possible, given that the unworkable restrictions on cold storage are slated to take effect on January 1, 2026.

About CUSER

CUSER members represent a significant portion of the cold storage warehouse sector. Our

[1] U.S. EPA, *Restrictions on the Use of Certain Hydrofluorocarbons under the American Innovation and Manufacturing Act of 2020: Phasedown of Hydrofluorocarbons; Final Rul*e, 88 Fed. Reg. 73,098 (Oct. 24, 2023).

[2] 42 U.S.C. § 7675(i)(3) ("Petitions (A) In general-- A person may petition the Administrator to promulgate a rule under paragraph (1) for the restriction on use of a regulated substance in a sector or subsector . . . (B) Response-- The Administrator shall grant or deny a petition under subparagraph (A) not later than 180 days after the date of receipt of the petition . . . If the Administrator grants a petition under subparagraph (B), the Administrator shall promulgate a final rule not later than 2 years after the date on which the Administrator grants the petition.").

members design, build and/or use industrial packaged synthetic refrigerant systems utilizing HFCs that meet the 700 GWP threshold established by EPA for most industrial/commercial-scale sectors, but our current designs generally cannot meet the lower 150 GWP threshold that EPA imposed on the cold storage sector in the 2023 final rule.

Background

Cold storage warehouses are a core element of the "cold chain" that provides fresh, affordable food to 340 million Americans in this country and our markets abroad. Cold storage facilities support the food, pharmaceutical, health care, cosmetics, biotechnology, chemical, retail, agriculture, and other sectors. Cold storage must be capable of reliably maintaining temperatures from -20°F to 55°F for refrigerated and frozen storage. The cold storage sector is critical to an affordable food supply and any unwarranted costs imposed on our sector will be felt downstream by retailers and consumers. At a time when American families are struggling with persistent inflation, EPA should be especially concerned about the effects of its regulations on kitchen table economics.

Some of our members have been designing and installing industrial refrigeration systems for more than 45 years and have among them hundreds of years of experience in the cold storage and other refrigeration sectors. Much of that experience was previously devoted to ammonia refrigeration systems. However, due to ongoing concerns about the toxicity and flammability of ammonia (a so-called "natural refrigerant"), our members have been steadily transitioning away from ammonia systems to highly efficient, safer HFC-based systems. Our newer HFC-based systems use non-toxic/non-flammable refrigerants that enable safer cooling systems, which delivers the added benefits of requiring no water and consuming less power than comparable ammonia systems. As highly engineered, custom designs, HFC-based cold storage systems also have very low leak rates, unlike other sectors regulated under the Technology Transition Rule – a fact that EPA did not recognize in the original rule.

Historically, cold storage used various refrigerants such as CFCs and HCFCs (which have now been phased out due to ozone depletion concerns) and ammonia (which is increasingly disfavored due to toxicity and flammability hazards). In past decades, the cold storage sector transitioned to use of various HFCs such as R-134a, R-404A, R-410A, and R-507C, responding to EPA's earlier phaseouts of CFC and HCFC refrigerants while still having a strong need for non-toxic and non-flammable solutions. Over this period, HFC-based systems have not only replaced ODS systems, but also increasingly displaced ammonia systems.

Our members have consistently sought to implement cold chain systems that use refrigerants with lower global warming potential; however, our sector is constrained by what refrigerant formulations are available on the market at a workable price. For example, many of our members initially used systems with R-507 (GWP 3,985) as a substitute for older CFC and HCFC refrigerants.[3] In the mid-teens, the sector transitioned to using R-134a (GWP 1,430) and beginning in 2022 the transition began to R-513A (GWP 631), an HFC with only half the GWP of R-134a. The supply chain has successfully developed to support R-513A refrigerant. However, the

[3] GWP expressed as AR4 100-yr values.

substitutes identified by EPA in its Technology Transition Rule for the cold sector remain largely unavailable and cost prohibitive despite EPA's predictions that substitutes would become commercially available. Our sector is open to further transition, but we can only do that if substitutes are technically available, economically feasible, legally allowed, and safe for users and their home communities.

I. AIM Act Technology Transition Petition

This petition is submitted pursuant to subsection (i) of the AIM Act and EPA's regulations at 40 C.F.R. 84.62 and addresses each of the statutory and regulatory factors below.[4]

Request to Set GWP Limit at 700 for Cold Storage

The Coalition requests that EPA impose a limit of **700 GWP for refrigerants used in the cold storage warehouse sector** under Part 84.54(c)(9), rather than the current caps of 150 GWP and 300 GWP slated to take effect starting with calendar year 2026.[5] The Coalition further requests that EPA act quickly on this petition by initiating a rulemaking to promulgate a final rule as soon as possible but no later than mid-2025 with the goal that the 700 GWP restriction for cold storage should become effective as soon as possible but no later than January 1, 2026.[6]

[4] EPA's regulations at 40 C.F.R. § 84.62 governing AIM Act subsection (i) petitions require that the petitioner address the following elements: "(1) The sector and subsector(s) for which restrictions on use of the regulated substance would apply. (2) For each sector and subsector identified in a petition, the restriction on the use of a regulated substance through any of the following: (i) A global warming potential limit that will apply to regulated substances or blends containing regulated substances with global warming potentials at or above that limit; (ii) Identification of the regulated substance(s) or blend(s) containing a regulated substance to be restricted and its global warming potential according to § 84.64; or (iii) Another form of restriction with an explanation for why a restriction under paragraph (a)(2)(i) or (ii) of this section would not be appropriate. (3) For each restriction on the use of a regulated substance contained in a petition, the effective date on which the regulated substance use restriction would commence and information supporting the identified effective date. (4) Address whether the Administrator negotiate with stakeholders in accordance with the negotiated rulemaking procedure provided for under subchapter III of chapter 5 of title 5, United States Code, including an explanation of their position to support or oppose the use of the negotiated rulemaking procedure. (5) For each requested restriction, to the extent practicable, information related to the considerations provided in subsection (i)(4) of 42 U.S.C. 7675 to facilitate the Agency's review of the petition."

[5] 40 C.F.R. § 84.54(c)(9) currently provides: "(c) No person may install any system, nor have any such system be installed through their position as a designer, owner, or operator of that system, in the following sectors or subsectors that uses a regulated substance as listed in this paragraph (c): . . . (9) Effective January 1, 2026, cold storage warehouse systems as follows: (i) Systems with a refrigerant charge capacity of 200 pounds or greater, that are not the high temperature side of a cascade system, using a regulated substance, or a blend containing a regulated substance, with a global warming potential of 150 or greater; (ii) Systems with a refrigerant charge capacity less than 200 pounds, using a regulated substance, or a blend containing a regulated substance, with a global warming potential of 300 or greater; (iii) Cascade refrigerant systems using a regulated substance, or a blend containing a regulated substance, on the high temperature side of the system with a global warming potential of 300 or greater."

[6] The AIM Act provides for a 1-year transition period; however, the Coalition believes that EPA can shorten this period when the new regulation provides an adjustment to existing limits rather than more stringent regulation and when the subject provision has not yet taken effect. *See* 42 U.S.C. § 7675(i)(6) ("Effective date of rules. No rule under this subsection may take effect before the date that is 1 year after the date on which the Administrator promulgates the applicable rule under this subsection.").

EPA's Technology Transition Rule Assumptions Have Not Borne Out

Subsection (i) of the AIM Act, euphemistically captioned "Technology transitions," provides that EPA "may by rule 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." In 2023, EPA developed its Technology Transition Rule, which barred the use of HFCs with GWP greater than 150 for most of the cold storage sector.[7] EPA chose the 150 GWP limit for the cold storage sector under the assumption that various substitutes would become available in the market by 2026 and would be allowed by local building codes within that timeframe. But as discussed below, these assumptions have not borne out in the subsequent year since EPA's initial rule was finalized. Accordingly, EPA should use its authority under subsection (i) of the AIM Act to set a restriction limit of 700 GWP for the cold storage warehouse sector instead of the initial 150 GWP limit, which is proving to be unworkable.

EPA has already set a limit of 700 GWP for 15 other industrial and commercial sector categories that have similar technical and supply chain needs as does the cold storage sector.[8] In its 2023 rule, EPA recognized that substitutes less than 700 GWP for these sectors would not be available or workable, even though the refrigeration systems in those sectors are similar to those used in cold storage. The disparity between EPA's realistic assessment of these other sectors that need substitutes up to 700 GWP, in contrast to EPA's assumptions for the cold storage sector that are now obviously unsupportable, provides sufficient reason for EPA to establish a limit of 700 GWP for the cold storage sector to match its kindred sectors. As shown in Table 1 on page 5, cold storage facilities are large-scale commercial/industrial operations with refrigerant charges measured in 1000s of pounds. Cold storage is functionally indistinguishable from other large-scale cooling operations such as data centers, industrial process refrigeration, and industrial/commercial chillers for which EPA imposed a 700 GWP cap.

In contrast, the sectors for which EPA has set a lower GWP limit of 150 GWP, such as residential refrigerators, vending machines, and automobile air conditioners, are so dissimilar from cold storage that the grouping is impossible to justify. These smaller appliances have only a fraction of the refrigerant charge and are completely different than cold storage in terms of design and manufacture.[9] In the table below, it is obvious that cold storage is mis-categorized with the other

[7] The cold storage provisions establish a limit of 300 GWP for smaller facilities with charge of less than 300 pounds, which are a relatively small part of the cold storage sector.

[8] 40 C.F.R. § 84.54 (setting 700 GWP limit for 15 sectors, including: self-contained residential and light commercial air conditioning and heat pump products at 84.54(a)(1); residential dehumidifiers at 84.54(a)(2); refrigerated transport at 84.54(a)(6); chillers for comfort cooling, ice rinks, and industrial process refrigeration at 84.54(a)(10); data center, information technology equipment facility, and computer room cooling at 84.54(a)(11); industrial process refrigeration products, other than chillers at 84.54(a)(12); residential or light commercial air-conditioning or heat pump systems at 84.54(c)(1); variable refrigerant flow systems for use as residential and light commercial air-conditioning or heat pumps at 84.54(c)(2); chillers for comfort cooling at 84.54(c)(3); ice rinks at 84.54(c)(4); chillers for industrial process refrigeration at 84.54(c)(5) and (6); refrigerated transport—intermodal containers at 84.54(c)(7); refrigerated transport—road or refrigerated transport—marine systems at 84.54(c)(8); certain industrial process refrigeration systems, other than chiller systems at 84.54(c)(10); and data center, information technology equipment facility, and computer room cooling systems at 84.54(c)(13)).

[9] 40 C.F.R. § 84.54 (setting 150 GWP limit for household refrigerators and freezers at § 84.54(a)(3); retail food refrigeration—stand-alone units at § 84.54(a)(4); vending machines at § 84.54(a)(5); self-contained automatic

sectors like in the familiar Sesame Street song "Which One of These Things Is Not Like the Others?":

Table 1: Miscategorization of Cold Sector (examples)

Subsectors with 150 GWP Limit	
Subsector	Charge
Foam Blowing	Constantly releasing refrigerant
Household Refrigerators	Charge is measured in ounces
Vending Machines	Charge is measured in ounces
Vehicle A/C	Charge is measured in ounces
Retail Food – standalone units	Charge is measured in pounds
Self-Contained Ice Machines	Charge is measured in pounds
Cold Storage Warehouse	**Charge is measured in 1,000s of pounds**
Subsectors with 700 GWP Limit	
Subsector	Charge
Chillers	**Charge is measured in 100s of pounds**
Data Center	**Charge is measured in 1,000s of pounds**
Industrial Process Refrigeration	**Charge is measured in 1,000s of pounds**
Stationary Light Commercial AC	**Charge is measured in 100s of pounds**

Moreover, the chemical manufacturers that produce the refrigerants available in the U.S. market have only produced a limited number of chemical products, catering to particular sectors. As shown in Table 2 on page 10, these chemical manufacturers are generally not producing HFC refrigerant products for the 150 GWP sectors. Allowing the cold storage sector to source from the same chemical lines as the 15 other sectors that have a 700 GWP limit will help streamline supply chain difficulties and manage cost for American consumers.

AIM Act Statutory Factors

In considering a petition under AIM Act subsection (i)(4), the statute directs EPA to consider the following factors: "(A) the best available data; (B) the availability of substitutes for use of the regulated substance that is the subject of the rulemaking or petition, as applicable, in a sector or subsector, taking into account technological achievability, commercial demands, affordability for residential and small business consumers, safety, consumer costs, building codes, appliance efficiency standards, contractor training costs, and other relevant factors, including the quantities

commercial ice machines at § 84.54(a)(8); industrial process refrigeration products, other than chillers [capacity >200 pounds and refrigerant temperature entering the evaporator > −30 °C (−22 °F)] at § 84.54(a)(12); motor vehicle air-conditioning at § 84.54(a)(12); foam products at § 84.54(a)(13); aerosol products at § 84.54(a)(13); industrial process refrigeration products, other than chillers [capacity >200 pounds and refrigerant temperature entering the evaporator > −30 °C (−22 °F)] at § 84.54(c)(10); remote condensing units in retail food refrigeration systems [refrigerant charge capacity of 200 pounds or greater] at § 84.54(c)(11); and supermarket systems [refrigerant charge capacity of 200 pounds or greater] at § 84.54(c)(12)).

of regulated substances available from reclaiming, prior production, or prior import; (C) overall economic costs and environmental impacts, as compared to historical trends; and (D) the remaining phase-down period for regulated substances under the final rule issued under subsection (e)(3) [the AIM Act allowance program], if applicable." Similarly, AIM Act subsection (i)(5) requires EPA to "(A) evaluate substitutes for regulated substances in a sector or subsector, taking into account technological achievability, commercial demands, safety, overall economic costs and environmental impacts, and other relevant factors; and (B) make the evaluation under subparagraph (A) available to the public, including the factors associated with the safety of those substitutes."

The AIM Act statutory factors and criteria are discussed at greater length in Part III, below.

Negotiated Rulemaking

The Coalition does not suggest that EPA engage in negotiated rulemaking. It is our understanding that EPA has previously considered and declined that process in the 2023 rulemaking process for AIM Act petitions. Regardless, the Coalition does not believe that negotiated rulemaking will be productive in this situation.

II. Major Considerations

In considering this petition, EPA should acknowledge the experience of the cold storage sector since EPA's initial October 2023 rule, which has shown that no safe or efficient substitutes suitable for cold storage have actually become available in the market at less than 150 GWP, although some substitutes are available at less than 700 GWP. Moreover, the so-called natural refrigerant such as ammonia and carbon dioxide which EPA assumed are suitable for cold storage have serious safety and performance impediments which make them unsuitable for many cold storage applications. We provide the following information to inform EPA's consideration of the petition to adjust the GWP limit for the cold storage sector.

The Problem with Ammonia

EPA should set the GWP limit for cold storage at 700 GWP to allow at least some low-GWP HFCs to continue to be used in the cold storage sector instead of forcing the sector to build more ammonia facilities. The dangers of using ammonia in industrial facilities are widely recognized, but perhaps not fully appreciated by EPA.[10] Ammonia is highly toxic and flammable. Per EPA, ammonia "is listed as a lower flammability, higher toxicity (B2L) refrigerant in ASHRAE Standard 34."[11] EPA has also acknowledged that ammonia "is not used extensively in many other subsectors of the RACHP sector."[12] Yet EPA relied on the availability of ammonia as the primary substitute for

[10] OSHA strictly regulates ammonia as a toxic and hazardous substance that cannot be used without certain procedures and protocols, 29 C.F.R. § 1915.1000; however, OSHA's regulations have not prevented many industrial accidents involving ammonia systems and the risk to the public remains.

[11] U.S EPA, *Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons Under Subsection (i) the American Innovation and Manufacturing Act of 2020; Proposed Rule*, 87 Fed. Reg. 76,738, 76,781 (Dec. 15, 2022).

[12] 87 Fed. Reg. at 76,781.

HFCs in cold storage refrigeration systems.

According to the Centers for Disease Control and Prevention, exposure to ammonia can cause serious injuries, and even death, including abdominal pain, coughing up fluid caused by pulmonary edema, blistering of skin, burning of nose, throat, lungs, and eyes, frostbite if exposed to liquified ammonia, narrowing and swelling of the throat, nausea, permanent or temporary blindness, skin pain, skin redness, and vomiting. In contrast, there has never been a documented serious injury or death from HFC refrigerants. Unfortunately, ammonia leaks are more common than some would like to admit. EPA itself has cataloged the stark dangers of ammonia refrigerant. In its publication "Hazards of Ammonia releases at Ammonia Refrigeration Facilities," EPA acknowledged that "ammonia is a toxic gas" that can cause "harmful effects on workers and the public" including explosions and "injury and fatalities."[13] EPA also describes ammonia as a "fire and explosion hazard at concentrations between 16 and 25%" and notes that the addition of lubricating oil (which is common in refrigeration systems) can create "much broader explosive range."

Notwithstanding stringent EPA and OSHA hazard prevention rules, ammonia leaks continue to cause widespread damage in populated areas. Some examples of ammonia accidents just in the last couple years since EPA developed its cold storage rule include:

- In mid-2024, some 287 employees were evacuated under a "mass casualty incident response" after an ammonia leak in Virginia, with five persons hospitalized in serious condition (Appx. A).
- In October 2024, an Illinois father, his two young children, and two other persons were killed by ammonia exposure when a semitruck carrying thousands of gallons of toxic ammonia crashed on the highway (Appx. B).
- A man died after being exposed to ammonia plume from a neighboring industrial facility (Appx. C).
- One person died and another was seriously injured when ammonia leaked from the food processing facility in Norwood, Massachusetts (Appx. D).
- In October 2024, employees at a Kraft-Heinz facility were evacuated after ammonia leaked from an internal cooling system in Davenport, Iowa (Appx. E).
- In October 2024, an arena was evacuated when ammonia leaked from an ice rink compressor system in Muskegon, Michigan where the Muskegon Lumberjacks hockey team as well as soccer and football teams play (Appx. F).
- In August 2024, a supply chain facility in Florence, Kentucky was evacuated when ammonia leaked from the facility (Appx. G).
- In October 2024, four chemical plant workers suffered inhalation burns to their airways from a ruptured ammonia storage cylinder in Baton Rouge, Louisiana (Appx. H).

[13] U.S. EPA, *Hazards of Ammonia releases at Ammonia Refrigeration Facilities*, EPA 550-F-98-017 (Aug. 1998), https://nepis.epa.gov/.

- In September 2024, a Hood's ice cream factory was evacuated and a nearby highway shut down in Suffield, Connecticut when ammonia leaked at the facility (Appx. I).
- In March 2024, EPA fined a cold storage warehouse for an earlier release of ammonia from a faulty valve that caused an evacuation (Appx. J).
- In May 2023, a poultry worker was "ravaged [in] her eyes, throat, and lungs" by a cloud of ammonia gas while other workers fled the toxic gas at a meat plant in Hope, Arkansas. The victim had to undergo multiple throat surgeries and two corneal transplants and still suffers from chronic coughing fits (Appx. K).

In contrast, HFCs are non-toxic, non-flammable and generally considered safe. They are so safe that HFCs are widely used in medical inhalers that are breathed directly to carry medicine into the lungs.

Although the Coalition is not opposed to allowing the use of ammonia as a refrigerant where appropriate, EPA should not mandate ammonia where safety and performance considerations caution against using this toxic gas. EPA must also carefully consider the increasing danger of using ammonia refrigeration as more cold storage facilities, data centers, and industrial process facilities are built throughout the United States.

EPA has extensive regulations governing ammonia refrigeration systems that are necessary to guard against deadly accidents due to ammonia's toxicity and propensity to leak from high pressure systems. Despite these regulations, ammonia remains a dangerous killer if not properly handled. In its October 2023 rule, EPA chose to promote ammonia refrigeration systems under the assumption that cold storage warehouses could safely use ammonia because they were located in isolated areas away from population centers. This assumption has been shown over the past year to have been incorrect. As the attached illustrations (*Figures 1* and *2*) show, cold storage facilities are already located and are increasingly being built overwhelmingly in densely populated urban areas – which makes sense because cold storage is used in the food supply chain and facilities are located where people live and work.

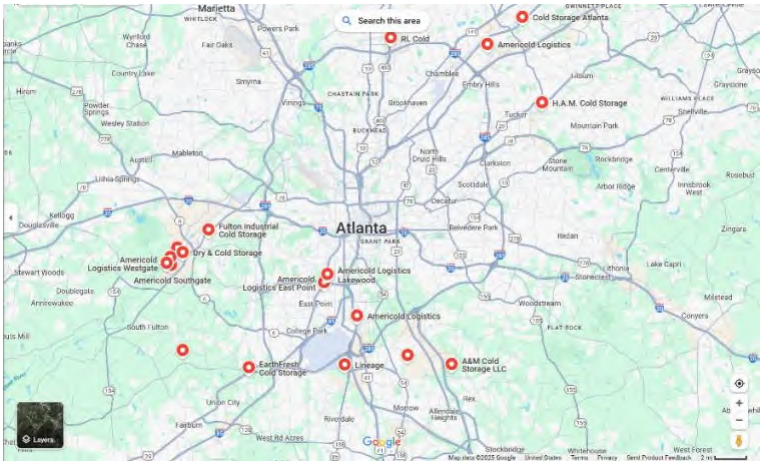


Figure 1 – Cold Storage Locations in Atlanta Metro Area

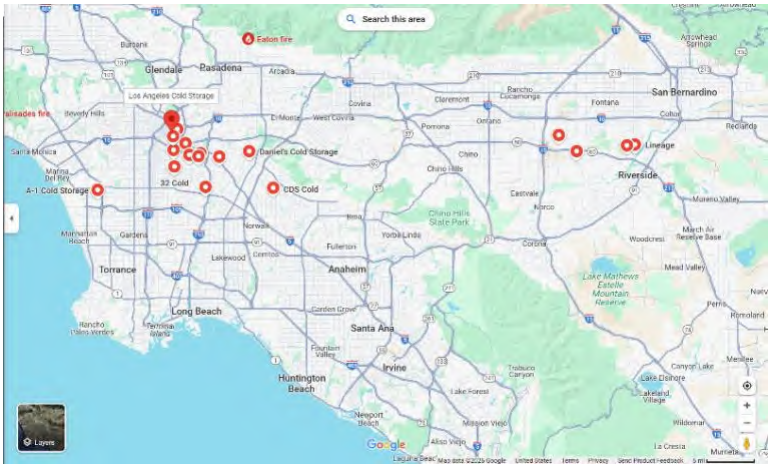


Figure 2 – Cold Storage Locations in Los Angeles Metro Area

EPA also must recognize that ammonia needs to be transported to ammonia-based refrigeration systems – usually through populated areas. As the above discussion shows, many dangerous ammonia accidents occur on our highways and in transferring ammonia from production facilities to end users.

Counterintuitively, EPA's pressure on industry to use ammonia for the agency's mandate to switch away from safe, nontoxic halocarbons (like R-513A) is accelerating the danger to workers and neighboring communities. In its Response to Comments in the October 2023 rulemaking, EPA stated that "[r]egarding the comment about the safety and extensive requirements when using ammonia in refrigeration systems such as for cold storage warehouses, EPA acknowledges that some companies may prefer to use refrigerants with lower toxicity than ammonia. EPA has considered safety along with the other factors in AIM Act section (i)(4)(B) in determining whether alternatives are available. EPA is aware of other available refrigerants with lower toxicity than ammonia that are not flammable, including CO2 and several blends of HFCs and HFOs (e.g., R-450A, R-471A, R-513A, R-515B)."[14] However, as discussed in this petition, except for R-513A, the substitutes identified by EPA are not commercially available or are not suitable for cold storage systems.

Accordingly, EPA should recognize that, contrary to its previous assumptions, ammonia is not a preferred refrigerant for many cold storage facilities. Furthermore, these facilities are being located in populous areas as cold storage demand increases. Even for cold storage facilities in less populated areas, EPA should not be cavalier in devaluing the lives of blue-collar facility workers and neighboring communities that can be exposed to ammonia risks compared to protecting white-

[14] *Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons under Subsection (i) of the American Innovation and Manufacturing Act of 2020; Response to Comments*, EPA Doc. ID No. EPA-HQ-OAR-2021-0643-0227 AT 142 (Oct. 24, 2023), https://www.regulations.gov/document/EPA-HQ-OAR-2021-0643-0227.

collar office workers.[15]

The Problem with Other Substitutes

EPA based its October 2023 rule for cold storage on the assumption that certain identified ultra-low-GWP HFC or HFO refrigerants would be available by the January 1, 2026 effective date of EPA's Part 84.54(c)(9) restrictions. This assumption simply has not borne out over the last year. Each of the substitute refrigerants identified by EPA has serious problems that have prevented those chemicals from being available in the marketplace for use in cold storage applications. The considerations that prevent all of EPA's identified <150 GWP candidate refrigerants from being available or practicably workable in cold storage warehouse systems are summarized in Table 2, below.

Table 2: Cold Storage – EPA Identified Candidate HFC Substitutes[1]

ASHRAE # (GWP)	Safety[2]	Commercial Availability	Energy Efficiency	Useability / Feasibility
R-717 (ammonia) (GWP 1)	TOXIC/ FLAMMABLE	AVAILABLE	EFFICIENT	NOT FEASIBLE Safety risks (toxicity/flammable).
R–744 CO2 (GWP 1)	ISSUES [3] (High Pressure)	AVAILABLE	NOT EFFICIENT [4]	NOT FEASIBLE Safety risks (high pressure); low energy efficiency.
R-513A [5] (GWP 631)	NO ISSUES	AVAILABLE (banned by EPA for Cold Storage)[6]	EFFICIENT	PREFERRED
R-471A (GWP 144)	NO ISSUES	UNAVAILABLE	UNKNOWN	NOT FEASIBLE Not commercially available.
R–454C (GWP 146)	FLAMMABLE	AVAILABLE	EFFICIENT	NOT FEASIBLE Not mechanically practical due to excessive displacement requirements, safety risk (flammable).
R–457A (GWP 137)		UNAVAILABLE		NOT FEASIBLE No information available from vendors.
R–516A (GWP 140)		UNAVAILABLE		NOT FEASIBLE No information available from vendors.
R–515B (GWP 287)	NO ISSUES	AVAILABLE (banned by EPA >150 GWP)		NOT FEASIBLE Not mechanically practical due to excessive displacement (91% 1234ze).
R–454A (GWP 237)	FLAMMABLE	AVAILABLE		NOT FEASIBLE

[15] 87 Fed. Reg. at 76,781 ("These factors [location of cold storage facilities in less-populated areas] reduce the risk of using R–717 [ammonia], compared with other applications where more people might be present such as an office building.")

		(banned by EPA >150 GWP)		Not mechanically practical due to glide for flooded applications, safety risk (flammable).
HCFO–1233zd(E) (GWP 4)		**UNAVAILABLE**		**NOT FEASIBLE** Not mechanically practical due to excessive displacement.
HFO–1234yf (GWP 1)	**FLAMMABLE**	**AVAILABLE**	**EFFICIENT**	**NOT FEASIBLE** Similar to R-513, but safety risk (flammable) and 3x cost.
HFO–1234ze(E) (GWP 1)	**FLAMMABLE**	**AVAILABLE**	**EFFICIENT**	**NOT FEASIBLE** Not practical due to excessive displacement, safety risk (flammable), and 2x cost.

[1] AIM Act Technology Transitions Final Rule, 88 Fed. Reg. at 73,162.

[2] Group classification, ASHRAE Standard 15, Safety Standard for Refrigeration Systems, and 15.2, Safety Standard for Refrigeration Systems in Residential Applications.

[3] Not Toxic or Flammable, but extremely high pressure.

[4] Transcritical CO2 systems are not efficient when compared to other systems that do not operate at transcritical temperatures/pressures.

[5] CUSER proposed substitute for >200-lb charge (<700 GWP limit).

[6] Includes status of EPA SNAP determination.

As Table 2 illustrates, there are simply no viable non-toxic refrigerants available with GWP < 150, although R-513A is available (and is currently used in the cold storage sector) if the GWP limit were adjusted to 700 GWP. The so-called alternatives that EPA based the October 2023 rule on have not proven to be viable options for the cold storage sector. As discussed above, ammonia is toxic and creates unwarranted liability exposure for the sector. Carbon dioxide requires unusually high pressures (which raise safety concerns) and energy efficiency losses that make it unsuitable for use in cold storage. The HFO substitutes that EPA has touted in the past are flammable (which creates liability exposure) and are often disallowed by state and local building codes. Finally, most of the HFC, HFO and blends that EPA predicted would become commercially available in the U.S. refrigerant market by 2026 are actually not in actuality being produced by the chemical manufactures that control the refrigerant market.

III. Consideration of Statutory Factors

The Coalition's petition to establish a limit of 700 GWP (rather than 150 GWP) for the cold storage sector under 40 C.F.R. § 84.54 is supported by consideration of the following AIM Act factors:

Subsection (i)(4)(A) (best available data)

- Data Sources
    - Analysis: The best available data on availability of substitutes is field data supplied by businesses that are actually engaged in the cold storage sector, as reflected in Table 2.

Subsection (i)(4)(B) (availability of substitutes)

- Technological Achievability
    - Analysis: The field data supplied by businesses actually engaged in the cold storage sector, as reflected in Table 2, shows that no refrigerants with GWP < 150 are actually available in the marketplace today, and there is no indication of availability in the future. Other substitute refrigerants are not technologically available due to safety, pressure or efficiency constraints.
- Commercial Demands
    - Analysis: As EPA has recognized previously, if the cost of a substitute is so high as to be commercially unmarketable there will be no commercial demand and therefore the substitute will not be available because it won't be produced. 88 Fed. Reg. at 83,140. Although EPA has not provided cost data for its candidate refrigerants for the cold storage sector, due to the unavailability or mechanical unsuitability of each of EPA's candidate refrigerants, it should be assumed that the cost of developing new technology for < 150 GWP refrigerants suitable for cold storage will be cost prohibitive.
- Affordability for Residential and Small Business Consumers
    - Analysis: EPA's candidate <150 GWP refrigerants are not actually available or commercially feasible at the present time; accordingly, candidate <150 GWP refrigerants are not affordable for small business. EPA has not provided any economic analysis in prior rulemaking documents that considers the real world experience identified in this petition. Residential considerations are not applicable for the cold storage sector.
- Safety
    - Analysis: As described above, the <150 GWP refrigerants proposed by EPA are either toxic, flammable, or require high operating pressures that are not suitable for cold storage applications.
- Consumer Costs
    - Analysis: Even if safe <150 GWP refrigerants were available in the future, the high costs associated with developing a new chemical will be passed down to consumers. EPA has not provided any economic analysis in prior rulemaking documents that considers the real world experience identified in this petition.
- Building Codes
    - Analysis: An important issue raised in the October 2023 rulemaking is the fact that many state and local building codes in America prohibit the use of the flammable

olefin-based refrigerants that EPA identified as substitutes for cold storage refrigeration systems. EPA defended this position in its Response to Comments by arguing that "Model codes may be adopted by States and localities and the next update to the model codes are consistent with updated industry standards that allow the use of substitutes identified in this rulemaking." RTC at 147-149. But in the year and a half since Part 84 was finalized, there is little indication that model codes have given up on safety concerns that make use of flammable refrigerants illegal. Much of this local safety regulation is based on the precautionary principle that accidents happen, and accidents involving toxic or flammable refrigerants, such as those embraced by the Biden Administration, are more difficult to control and prevent injuries.

EPA also assumed in the October 2023 final rule that the International Code Council would update its building codes to allow use of A2L refrigerants to go into effect as of 2024. 89 Fed. Reg. at 73,136 ("ICC, an international developer of model codes, standards, and building safety solutions, approved changes to many model codes that affect the availability of A2L refrigerants for the RACHP sector. These model code changes, which will go into effect in 2024, are consistent with updated industry standards that allow the use of substitutes identified in this rulemaking."). The expected update to the International Building Code in 2024 which did not happen as anticipated. 89 Fed. Reg. at 73,136 ("The International Building Code is scheduled to be updated in 2024, which would then need to be adopted by State and local jurisdictions."). Moreover, building code changes expected by EPA have not actually been adopted by most state and local governments that host cold storage facilities, such that using many of EPA's candidate <150 GWP refrigerants remains illegal.

- Appliance Efficiency Standards

    - Analysis: As noted, many of EPA's candidate <150 GWP refrigerants are not suitable for mechanical systems that support cold storage refrigeration due to their lower energy efficiency. Similarly, the additional indirect (Scope 2) greenhouse gas emissions from electricity generation required for EPA's candidate <150 GWP refrigerants make them unattractive for environmental purposes. Although EPA does not seem to have studied the issue, the increased indirect emissions from additional energy inputs could possibly outweigh any benefit of the lower GWP of the refrigerant substitutes themselves.

- Contractor Training Costs

    - Analysis: Because many of EPA's candidate <150 GWP refrigerants are not actually available in the market, the cold storage sector will incur increased contractor training costs to handle new refrigerants, some of which are toxic and flammable. EPA has not provided any economic analysis in prior rulemaking documents that considers the real world experience identified in this petition.

- Quantities Available from Reclaiming, Prior Production, or Prior Import

- Analysis: Because many of EPA's candidate <150 GWP refrigerants are not actually available in the market, there is little if any refrigerant available from reclaiming or stockpiles. The alternatives preferred by EPA either have no reclaim market (i.e., ammonia and CO2) or are so new that reclaim markets have not developed. EPA has not provided any economic analysis in prior rulemaking documents that considers the real world experience identified in this petition.

- Other Relevant Factors

  - Analysis: See discussion above.

Subsection (i)(4)(C) (overall economic costs and environmental impacts)

- Economic Costs

  - Analysis: As EPA has recognized previously, if the cost of a substitute is so high as to be commercially unmarketable there will be no commercial demand and therefore the substitute will not be available because it won't be produced. 88 Fed. Reg. at 83,140. Although EPA has not provided cost data for its candidate refrigerants for the cold storage sector, due to the unavailability or mechanical unsuitability of each of EPA's candidate refrigerants it should be assumed that the cost of developing new technology for < 150 GWP refrigerants suitable for cold storage will be cost prohibitive.

- Environmental Impacts

  - Analysis: The AIM Act requires EPA to evaluate the environmental impacts of its subsection (i) technology transition standards. In weighing the subsection (i) factors, the statute directs that EPA must consider environmental benefits of a sector restriction.

  - Climate Change Evaluation. EPA might consider climate change benefits as part of this inquiry; however, there is nothing in the statute that requires or allows EPA to prioritize climate benefits over other factors and considerations. EPA has suggested in other contexts that the purpose of the AIM Act is to reduce greenhouse gas emissions for climate change benefits. *See, e.g.*, 86 Fed. Reg. at 55,116 ("This Act mandates the phasedown of hydrofluorocarbons, which are highly potent greenhouse gases"). However, a focus on greenhouse gases as pollution is not supported by the statute, which itself never mentions greenhouse gases or climate change. And for good reason -- the political divisiveness of climate change prevented Congress at the time of the AIM Act's passage in 2020 from reaching consensus on any policy explicitly directed at climate change. Instead, the law (as is evident in its title "Innovation and Manufacturing") focuses on the economic benefits to certain U.S. chemical manufacturers of fostering innovation in the chemicals industry. In its evaluation of climate benefits, to the extent EPA considers greenhouse gas impacts at all, EPA should use a social cost of carbon factor that has been appropriately vetted by appropriate policy setting bodies within the

Executive Branch, including the White House Council on Environmental Quality and Office of Management and Budget.

- Low Leaks Rates. In the situation of cold storage warehouses, EPA seems to have previously assumed that larger refrigeration systems leak significant amounts of HFCs into the atmosphere. However, EPA should consider actual leak rates of cold storage refrigeration systems, such as the ALTA Expert system, which have no process emissions and much lower than typical leak rates, since they utilize heavy duty industrial components (such as is used in higher end industrial ammonia refrigeration systems) to provide safe, leak-free operation for the life of the system. In the experience of CUSER members, systems using R-513A are seeing less than 3% leak rate in systems from inception (based on ~10 years of data) versus the generally accepted industry leak rate of 25% for other systems. Leak rates are directly proportional to system design and construction (i.e., specifically the quality of the materials used in the system which is highly variable from "industrial" systems vs. "commercial" systems. Industrial systems such as those used in the cold storage sector are generally built with more robust materials such as stainless steel and carbon steel (no copper). In contrast, commercial systems in other sectors addressed by EPA are generally built with materials that are not as robust and consequently have higher leak rates.

Subsection (i)(4)(D) (remaining phase-down period)

- Allowance Program Phase-Down
  - Analysis: CUSER does not believe that the AIM Act allowance phase-down would be a factor in choosing among available low-GWP refrigerants for the cold storage sector.

Subsection (i)(5)(A) (evaluate substitutes)

- Technological Achievability
  - Analysis: See Table 2.
- Commercial Demands
  - Analysis: See Table 2.
- Safety
  - Analysis: See discussion above.
- Overall Economic Costs
  - Analysis: See discussion above.

- Environmental Impacts
    - Analysis: See discussion above.
- Other Relevant Factors
    - Analysis: See discussion above.

Conclusion

In conclusion, the Coalition respectfully requests that the U.S. EPA establish a restriction on the use of HFCs in new cold storage refrigeration units at a category cap of 700 GWP rather than 150 GWP.

In the alternative, the Coalition requests that EPA allow the continued use of certain viable, currently available, non-toxic refrigerants such as R-513A in the cold storage sector.

Sincerely,

Eric Brown, Chairman

The following CUSER members and companies in the cold storage sector support this petition:

Hon. Lee Zeldin, Administrator
U.S. Environmental Protection Agency

Agile Cold Storage
Airfoil
Bitzer
Burris Logistics
CoreX
Edmisten Consulting
FlexSpace
FlexCold
Frascold
Freez Construction
Interchange Cold Storage
Karmel Consulting
Maple Donuts
Mattingly Cold Storage
Midwest Refrigerated Services
Nor-Am
Permatherm
RL Cold
Royster Consulting Services
Super Radiator
Valley Cold Storage
Vertical Cold Storage
Vic Paulius Associates

APPENDIX A

VIRGINIA

Failed valve blamed for Sterling ammonia leak that sent 33 to hospitals

As of Thursday afternoon, 4 employees are still under medical observation and 29 have returned home.

Author: **Alanea Cremen**
Published: **11:33 PM EDT July 31, 2024**
Updated: **6:10 PM EDT August 1, 2024**

STERLING, Va. — Dozens of people were taken to area hospitals Wednesday night after an ammonia leak at a Sterling business.

According to Loudoun County Fire and Rescue Assistant Chief Travis Preau, crews were called to the building on Sous Vide Lane around 8:30 p.m. for reports of a gas leak. Upon arrival,

crews found ammonia had leaked into the building.

Fire crews searched the building in protective equipment and found everyone had made it out safely. A hazardous materials team then worked to identify the source of the leak. On Thursday, fire crews said a failed valve was to blame.

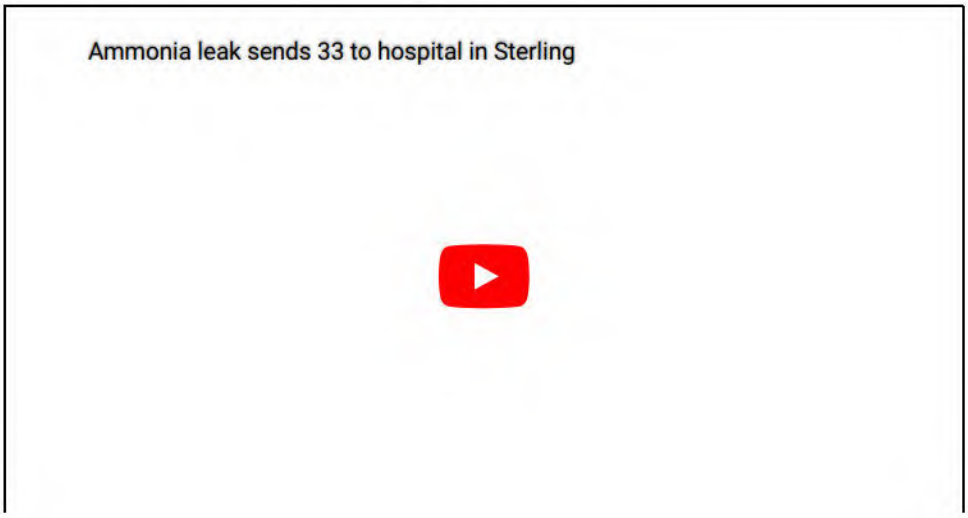
When first responders got to the scene, they found a group of about 200 employees who had evacuated. Due to the number of people, the incident commander requested a mass casualty incident response, which brought more emergency vehicles to the scene to help.

Of the 287 employees working in the facility at the time of the leak, a total of 33 patients were transported to area hospitals: five in serious condition, 17 in serious but non-life-threatening condition, and 11 with minor symptoms. The remaining 254 employees were isolated, evaluated, and did not require transport, authorities said.

As of Thursday afternoon, 4 employees are still under medical observation and 29 have returned home.

The facility was closed Thursday as well.

According to the Centers for Disease Control (CDC), exposure to high levels of ammonia can irritate the skin, eyes, throat, and lungs and cause coughing and burns. Additionally, lung damage and death may occur after exposure to very high concentrations of ammonia. Preau reported that it was pure ammonia leaking into the building.



Symptoms of exposure to high levels of ammonia include:

- Abdominal pain
- Coughing
- Coughing up white to pink-tinged fluid (sign of pulmonary edema)
- Blistering of skin
- Burning sensation in the nose, throat, lungs, and eyes
- Frostbite if exposed to liquified ammonia
- Narrowing of the throat and swelling
- Nausea
- Permanent or temporary blindness
- Skin pain
- Skin redness
- Vomiting

The leak was discovered by building maintenance staff, who were able to get it under control. Preau said crews were in the process of ventilating the building overnight.

HAZMAT crews were called to the area to evaluate the air around the building. There does not appear to be any concern for people who live or work near the building where the leak happened.

It is unclear what caused the leak at this time.

The CDC says if you are ever exposed to ammonia, to follow three steps:

1. Get away from the area where the ammonia was released and breathe fresh air.
2. Get it off your body right away.
3. Get help right away by calling 911, going to the hospital if local officials say it is safe to leave your home, or calling the Poison Control Center at 1-800-222-1222.

Related Articles

37 hurt, including 7 critical after Chicago-area chemical leak

Leaking ammonia evacuates UDC building

Ammonia leak at Waldorf skating rink prompts evacuations

APPENDIX B

Illinois father and his 2 children are among those killed by ammonia release from semi-truck crash, coroner says

By Keith Allen, Zoe Sottile, Andy Rose and Jared Formanek, CNN

Updated 10:57 PM EDT, Sun October 1, 2023

NewsNation/WTWO/AP

The Friday evening crash left five people dead and caused several injuries, according to Illinois officials.

(CNN) — An Illinois father and his two young children are among the five people killed by anhydrous ammonia exposure after a semi-truck carrying thousands of gallons of the toxic substance crashed Friday, the local medical examiner's office announced.

Those killed in the incident have been identified as Kenneth Bryan, 34, and his two children – Rosie, 7, and Walker, 10 – along with Danny J. Smith, 67, and Vasile Cricovan, 31, the

Effingham County Coroner's Office said in a release.

A preliminary examination indicates all five died from exposure to the leaked ammonia and official autopsies will begin Monday, the office said.

A 15-person National Transportation Safety Board (NTSB) team including motor carrier, hazmat and survival factors investigators arrived at the Effingham County site on Sunday, according to NTSB spokesperson Jennifer Gabris.

The sequence of events that led to the accident appears to have started when someone tried to pass the semi-truck, the NTSB said at a Sunday media briefing.

"Preliminary information indicates that another vehicle may have been involved in a passing maneuver near the tanker truck. The driver of the truck appears to have reacted by pulling to the right," said board member Tom Chapman. "The tanker truck departed the roadway. After departing the roadway, the truck rolled over, and the cargo tank was compromised."

The truck was carrying about 7,500 gallons of anhydrous ammonia at the time, according to the Illinois Environmental Protection Agency. The agency said early estimates indicate more than half – about 4,000 gallons – was released.

Several people were hospitalized due to ammonia exposure after the crash, including five who needed to be airlifted to local medical facilities, the coroner's office said.

The accident happened on US Highway 40 near Teutopolis, about 100 miles northeast of St. Louis, Missouri. The NTSB is investigating whether the tanker truck was rerouted onto the smaller highway due to an earlier crash on Interstate 70.

“As it rolled over, the tanker truck jackknifed and exposed the head end of the tank,” said Chapman. “As momentum carried the tank forward, it came into contact with the hitch on the utility trailer. The hitch punctured the cargo tank, leaving a hole approximately 6 inches in diameter.”

Approximately 500 people within a 1-mile radius of the crash were evacuated from parts of Teutopolis following the crash but were allowed to return to their homes Saturday night.

“Testing has indicated that the danger from the anhydrous ammonia has dissipated,” Teutopolis Assistant Fire Chief Joe Holomy said in a Saturday night news release. “We have notified residents that they may return home.”

Crews worked overnight Friday into Saturday to patch part of the rupture on the semi-truck – which slowed down the leak but did not stop it completely, according to Teutopolis Fire Chief Tim McMahon.

The crashed tanker was drained, patched, and taken to a secure location to be investigated by the NTSB, the state emergency management agency said. The Illinois State Police is also investigating the cause of the accident, it said.

Five dead in Illinois crash involving semi-truck carrying ammonia as evacuated residents begin to return home

What is anhydrous ammonia?

Anhydrous ammonia “is essentially pure (over 99 percent) ammonia,” says the Occupational

Safety and Health Administration (OSHA).

Ammonia used in households is a diluted water solution that contains 5 to 10 percent ammonia, according to OSHA.

Ammonia in high levels can irritate and burn the skin, mouth, throat, lungs and eyes, according to the Centers for Disease Control and Prevention. Very high levels can also damage the lungs or cause death.

Symptoms of anhydrous ammonia exposure include breathing difficulty; irritation of the eyes, nose or throat; and burns or blisters.

View on CNN

APPENDIX C

TOP STORIES

Autopsy rules death of man accidental after toxic gas leak at an agricultural plant in Huntington County

by: Marin Murphy
Posted: Apr 6, 2024 / 02:06 PM EDT
Updated: Apr 8, 2024 / 04:01 AM EDT

SHARE

HUNTINGTON COUNTY, Ind. (WANE) — A man is dead after a toxic gas leak at Nutrien Ag Solutions Saturday morning.

According to a press release from the Huntington County Coroner, Warren Volunteer Fire Department and Parkview Huntington Hospital EMS responded to Nutrien Ag Solutions after

reports of an anhydrous ammonia trailer leak. In the initial report, one employee of the company was not accounted for.

When emergency response teams arrived on scene they found a large plume of anhydrous ammonia behind a building. Anhydrous ammonia is widely used as a source of nitrogen fertilizer but can be dangerous if not stored as a pressurized liquid, according to the Department of Agriculture. If it is exposed to air it can often take over as a toxic gas and become fatal.

A search of the area found a man, 72-year-old Richard Clark of Ossian, Indiana. He was moved out of the area but was ultimately pronounced dead at the scene.

Pursuit results in crash near Whitley County line ›

An investigation into the cause of the leak is underway by the Indiana Department of OSHA, but it is believed to have come from a double anhydrous ammonia “pony” trailer.

An autopsy report, completed Sunday by the Northeast Indiana Forensic Center, revealed that Clark died of asphyxia, due to anhydrous ammonia exposure. They determined the manner of death to be accidental.

APPENDIX D

abc NEWS

Worker killed after ammonia leak at Massachusetts food plant

Surveillance video showed no foul play, police said.

By **Teddy Grant**

December 20, 2022, 6:32 PM ET • 3 min read

Worker died after ammonia leak at Massachusetts food plantOne person is dead and another was injured in an ammonia leak at a food processing facility in Norwood, Massachusetts, on Monday.Norwood Fire Department/Facebook

One person is dead and another injured due

to an ammonia leak at a commercial building in Norwood, Massachusetts, police officials said on Monday.

Norwood's police and fire departments responded to a 911 call after 11 a.m. local time on Monday over an ammonia leak at a food processing facility.

Norfolk County's District Attorney's office, alongside state police detectives, the Occupational Safety and Health Administration, State Fire Marshal Peter J. Ostroskey and the Fire Marshal's Hazardous Materials Team, are investigating the incident.

+ MORE: White House: Nord Stream gas pipeline leaks 'apparent sabotage'

According to the Norwood Police Department, two men working for an outside contractor were near the leak, leading to the incident.

The district attorney's office identified Richard J. Arguin, 68, of Dighton, as the deceased.

First responders provided aid to the other man and sent him to Massachusetts General Hospital for further treatment.

Ammonia is a chemical that is used in several industries, such as agriculture, manufacturing and food processing.

Norwood Firefighters on scene at 140 Morgan Drive in Norwood, Mass., for an ammonia leak in a commercial building, on Dec. 19, 2022.
Norwood Fire Department/Facebook

Ammonia can irritate and burn the skin, mouth, throat, lungs and eyes, according to the Centers for Disease Control and Prevention. High exposure to the chemical can cause death.

According to a 2021 study in the Proceedings of the National Academy of Science, 69% of air emission deaths of agricultural workers were due to ammonia.

In Massachusetts, the district attorney investigates all unattended deaths, including industrial accidents, the DA's office told ABC News.

"The information that we have is that this is an incredibly dangerous situation for the fire, Haz-Mat and police personnel responding," Norfolk District Attorney Michael W. Morrissey said in a press release. "We will be proceeding with this investigation as quickly as safety allows."

The district attorney's office said that the death seemed accidental and surveillance video showed no foul play, but an investigation is ongoing.

APPENDIX E

Officials: Kraft-Heinz employees forced to evacuate due to ammonia leak

Kraft-Heinz under evacuation

Kraft-Heinz evacuation

Kraft-Heinz evacuation

Kraft-Heinz evacuation

Kraft-Heinz evacuation

By KWQC Staff

Published: Oct. 10, 2024 at 5:53 AM PDT | Updated: Oct. 10, 2024 at 12:09 PM PDT

DAVENPORT, Iowa (KWQC) - Employees at the Kraft-Heinz factory on the north end of Davenport were forced to evacuate this morning. No injuries were reported.

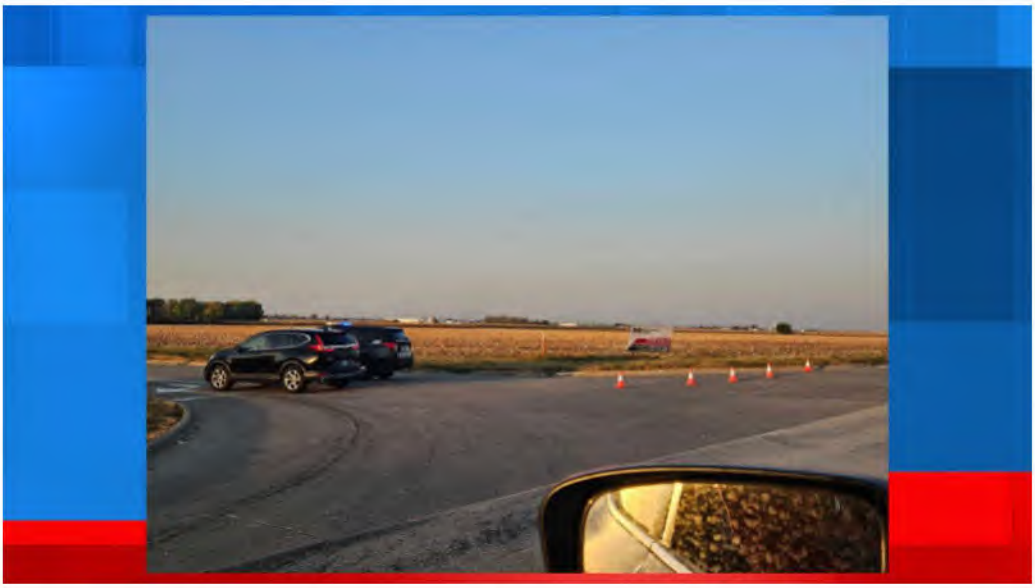
Thursday at approximately 6:40 a.m., the Davenport Fire Department responded to Kraft-Heinz, 9401 Granite Way, for a report of an ammonia leak, according to a media release from DFD. All employees were safely evacuated from the plant by the time the Hazardous Material Team arrived.

The problem was traced back to an internal cooling system, firefighters said. The problem was isolated, and crews were able to properly ventilate the area.

Monitoring equipment was set up within a mile of the plant to confirm that there were no other problems outside of the plant that were related to the leak, firefighters said. No employees were hurt and the company will resume air monitoring as a follow-up to the situation.

Kraft-Heinz released the following statement.

"Early this morning, we detected a refrigerant fluid leak in our Davenport manufacturing facility. Out of an abundance of caution, we sent all employees home. The leark has been fixed and we expect to resume normal operations this evening."



The Kraft-Heinz factory on the north end of Davenport is currently under evacuation. (Kaila Paige (KWQC))

Most Read


2 concert acts added to Mississippi Valley Fair 2025 grandstand lineup


First-time mom dies in 'tragic' crash after being ejected from golf cart, police say


Iowa student asking for changes to chronic absenteeism law


College student with peanut allergy dies after eating brownie from her friend


Mom facing jail time after son walked alone less than a mile from home, reports say


Sheriff's deputy fired after allegedly killing 7 dogs during animal welfare check

After fire toddler with 2nd-degree burns wasn't taken to hospital, police say


Hello Moline: Iowa duo returns home to play in the John Deere Quad Cities Showdown at Vibrant Arena

Latest News

APPENDIX F

prompts evacuation at Muskegon arena

by: Anna Skog
Posted: Oct 20, 2024 / 11:37 PM EDT
Updated: Oct 20, 2024 / 11:37 PM EDT

Firefighters respond to an ammonia leak at Trinity Health Arena. (Courtesy Muskegon County Hazardous Materials Response Team)

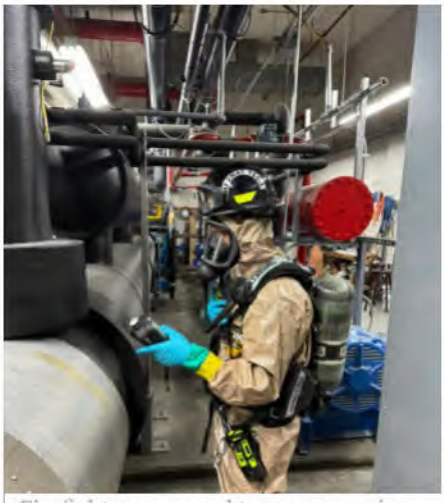
MUSKEGON, Mich. (WOOD) — Firefighters responded to an ammonia leak that was discovered at Trinity Health Arena in Muskegon Sunday.

The Muskegon County Hazardous Materials Response Team was called to the arena alongside Muskegon firefighters after an ammonia leak was reported, the hazardous materials team wrote in a social media post.

The first firefighters to respond shut off the compressor system and evacuated the arena when they arrived. A hazardous materials team was sent in for air monitoring.

remains a top killer of Americans. According to law

The team and a contractor found a fault in the ice rink system and was able to fix it and confirm there were no more leaks. Then the hazardous materials team made sure it was safe for reentry, the post said.



Firefighters respond to an ammonia leak at Trinity Health Arena ...

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Firefighters respond to an ammonia leak at Trinity Health Arena ...

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Trinity Health Arena serves as home to the Muskegon Lumberjacks, a hockey team in the United States Hockey League, as well as the Muskegon Risers, a soccer team, and West Michigan Ironmen, a football team.

APPENDIX G

Employees evacuated from plant in northern Kentucky after ammonia leak

Updated: 12:23 PM EDT Aug 29, 2024

Infinite Scroll Enabled

Emily Sanderson
Digital Media Manager

FLORENCE, Ky. — A small ammonia leak led to an evacuation at a plant in northern Kentucky.

It happened around 10 a.m. at Schwan's Global Supply Chain on Empire Drive.

According to Maj. Philip Ridgell with the Boone County Sheriff's Office, a small ammonia leak led to everyone being evacuated from the building.

Employees were taken away by a bus so they weren't outside in the heat.

Ridgell said there's no threat or injuries.

Officials say it will take a few hours to clean up, but there won't be any impacts to traffic.

APPENDIX H

Calif. search and rescue team saves hiker in frigid conditions

AHA releases new guidelines for preventing stroke

Airway management

Workers suffer airway burns during leak at La. chemical plant

Four workers were injured during an ammonia gas leak at a Baton Rouge chemical plant

October 11, 2024 08:20 AM

4 people exposed to ammonia at Formosa Plastics in Baton Rouge; no danger to public, officials sa...

By David Mitchell

The Advocate

BATON ROUGE, La. — Four workers at a Baton Rouge chemical plant were hospitalized Tuesday night when a storage cylinder broke, releasing toxic ammonia gas, fire officials said.

The leak at Formosa Plastics' complex on Scenic Highway happened around 8:40 p.m., Emergency Medical Services said. Two of the four workers were in critical condition with inhalation burns.

Remember 2 Things: Caring for airway burns and managing swelling

---

Investigators with the U.S. Occupational Safety and Health Administration opened an inquiry into the incident that led to the injuries, a spokeswoman said Wednesday. The agency hasn't issued any worker safety violations against Formosa in Baton Rouge since at least Jan. 1, 2019.

Baton Rouge Fire Department officials estimate the cylinder had a capacity of 150 pounds, though it is not clear how much ammonia was released. They said the ammonia gas likely quickly dissipated in the air and posed no danger to the broader public.

Curt Monte, spokesman for Baton Rouge Fire, said the cylinder failure wasn't part of the process equipment that would have led to a continuing leak.

Officials with the state Department of Environmental Quality said the release did not have an impact off Formosa's complex along the Mississippi River, just north and west of the ExxonMobil refinery and chemical complex.

A nitrogen-based chemical, ammonia is prevalent naturally in the air, water and soil in extremely low concentrations. But in concentrated amounts, the colorless, pungent gas can be a caustic hazard when it hits the moisture of the eyes, skin and upper respiratory tract, according to the U.S. Environmental Protection Agency and industry safety reports.

The Formosa Plastics complex has been in Baton Rouge since the early 1980s and makes polyvinyl chloride, a key material in consumer plastic products like plumbing pipes and food wrap. The facility has units that make PVC and vinyl chloride monomer, and recover hydrochloric acid from chemical processes by burning hazardous waste byproducts from PVC manufacture.

The facility has had several minor leaks in the past four years, often of the human carcinogen vinyl chloride and probable carcinogen ethylene dichloride.

Trending

Substance Abuse

CDC reports overdose deaths on the decline

November 17, 2024 08:00 AM

Infectious Diseases

Calif. health officials dip into pandemic stockpile in response to bird flu

November 16, 2024 12:00 PM

Many of the most recent leaks were smaller than the required reporting thresholds and unlikely to lead to violations, a state database of company estimates says, but for many years prior, the complex drew the attention of state and federal regulators for alleged emissions and other violations.

The plant remains in noncompliance over high-priority state air quality violation allegations leveled in 2009 that include exceedances for carcinogenic vinyl chloride in the early to mid-2000s and breakdowns in how the company failed to inspect emergency relief valves over decades, federal and state databases show.

It is wasn't clear why the company remains in noncompliance, but EPA officials say the tag can linger until all terms of a settlement or compliance order are completed, even after underlying problems are corrected. Nearly a decade and a half ago, Formosa told regulators it had found a way to inspect and repair the more than 25-year-old relief valves.

No estimate was available Wednesday for how much ammonia escaped into the air Tuesday night.

Officials with Formosa didn't immediately respond to requests for comment Wednesday.

Airway management Hazmat Patient Assessment

APPENDIX I

Ammonia leak at HP Hood facility in Suffield closes road, causes evacuations

Suffield ammonia leak on Sept 25 - WFSB

Ammonia leak at HP Hood facility in Suffield closes road, causes evacuations

Ammonia leak at HP Hood facility in Suffield closes road, causes evacuations

Ammonia leak at HP Hood facility in Suffield closes road, causes evacuations

VIDEO: Ammonia leak at dairy facility in Suffield closes roads, causes evacuations

BREAKING: Hazma situation unfolds in Suffield

By Jay Kenney, Olivia Schueller and Dylan Fearon

Published: Sep. 25, 2024 at 2:02 AM PDT | Updated: Sep. 25, 2024 at 8:39 AM PDT

SUFFIELD, CT (WFSB) - Crews responded to an ammonia leak in Suffield early Wednesday morning.

At 12:47 a.m., police said they were notified of the leak at HP Hood, located at 1250 East Street South.

Hood released a statement later in the morning.

> *"HP Hood's Suffield, CT, manufacturing facility experienced a release of ammonia this morning. The facility was immediately evacuated and emergency responders were promptly notified, both in accordance with the facility's emergency response program. At this time, there have been no reported injuries. The event is currently under investigation.*
>
> *We have a comprehensive emergency response program to ensure an expeditious response and management of any/all emergency situations as the safety of our employees and the community is our immediate priority."*
>
> *— Lynne Bohan, group vice president, communications, HP Hood LLc*

Hood's ice cream division was said to be in the facility, one of the largest dairy processors in the country.

Suffield's fire, police, volunteer ambulance association, and mutual aid companies from Windsor Locks and Enfield responded.

Hood was immediately evacuated, along with neighboring businesses and one home, the town's first selectman said.

The state's Department of Energy and Environmental Protection was notified and a response team was sent to assist.

DEEP said no ammonia was detected outside of the building. However, it was monitoring air quality.

According to Dr. Mark Metersky, Pulmonary Critical Care and Sleep Medicine at UConn Health, even the smallest ammonia leaks are serious.

"It can be very short exposure that can cause a lot of damage." noted Dr. Metersky. "It can be subtle, such as eye and throat irritation from low level exposure."

No injuries were reported.

Route 159 was closed between Suffield Street and MacDougall Prison. It has since reopened.

Channel 3 has a crew on the scene.

Harvey Lane, however, remained closed as of 8:30 a.m.

Investigators have been on scene since the middle of the night to figure out how to contain the leak and finding the cause while keeping everyone safe.

Police estimated that hazmat crews would be on the scene for a couple more hours.

Refresh this page and watch Eyewitness News for updates.

APPENDIX J

EPA Settles Chemical Accident Prevention Case in New Bedford

March 15, 2024

Contact Information
Jo Anne Kittrell (kittrell.joanne@epa.gov)
857-262-3789

New Bedford, Mass. (Mar.15, 2024) – Today, EPA announced a proposed consent agreement and final order (CAFO) that will settle EPA's administrative enforcement case against Northern Wind, LLC (Northern Wind) for alleged violations of the Emergency Planning and Community Right-to-Know Act and the Clean Air Act's chemical accident prevention requirements.

Under the proposed CAFO, Northern Wind will pay a settlement penalty of $72,000.

"The thousands of people who live and work near this facility have the right to feel safe from the serious health issues and other consequences of chemical accidents," **said EPA New England Regional Administrator David W. Cash.** "This action reduces the risks of chemical accidents in neighborhoods that already have shouldered a greater share of environmental concerns."

Background:

Northern Wind is a private company that primarily engages in the storage and wholesale distribution of fresh and frozen seafood products. The company operates a cold storage warehouse and distribution center at 75 MacArthur Drive, New Bedford, Mass (Facility) that uses anhydrous ammonia as a refrigerant to maintain appropriate temperatures for the storage of seafood products.

On August 4, 2020, an accidental release of anhydrous ammonia occurred at the Facility. The building was evacuated (12 employees), and no injuries were reported. The ammonia leaked from a faulty isolation valve on the drain of the pilot receiver.

Emergency Planning and Community Right-to-Know Act: EPA alleges that Northern Wind violated EPCRA Section 312 by failing to timely submit the required Tier 2 form for anhydrous ammonia to the local emergency planning committee, the state emergency response commission, and the local fire department for calendar year 2019. That year, Northern Wind's Facility stored at least 1,050 pounds of anhydrous ammonia (the Tier 2 reporting threshold for ammonia is 500 pounds). The Facility's Tier 2 report for anhydrous ammonia was due by March 1 of 2020. Northern Wind filed the missing report on August 10, 2020.

Clean Air Act 112(r)(1): EPA alleges that Northern Wind violated the General Duty Clause of the Clean Air Act by failing to properly identify hazards that may result from accidental releases of anhydrous ammonia using appropriate, industry recognized hazard assessment techniques. After being notified of the violation, Northern Wind completed a process hazard review in September 2020.

A copy of the CAFO is available upon request.

Additional Resources:

- Facility reporting requirements under Section 312 of Emergency Planning and Community Right-to-Know Act (EPCRA) <https://epa.gov/epcra>
- EPA information on the General Duty Clause requirements of Section 112(r) of the Clean Air Act <https://epa.gov/rmp/general-duty-clause-under-clean-air-act-section-112r1>
- Accident Prevention and Response Manual for Anhydrous Ammonia Refrigeration System Operators <https://epa.gov/rmp/accident-prevention-and-response-manual-anhydrous-ammonia-refrigeration-system-operators>

Last updated on March 15, 2024

APPENDIX K

Dangerous chemical leaks have injured workers at one of America's largest meat processors

By Casey Tolan and Isabelle Chapman, CNN. Photographs by Austin Steele, CNN
Published 6:59 AM EDT, Thu May 4, 2023

CNN

A Tyson plant is pictured in Hope, Arkansas, where eight workers were injured during an ammonia leak in 2016.

Hope, Arkansas (CNN) — Mimi Perkins' job on the graveyard shift at a Tyson Foods poultry plant started like any other night: hosing down the blood, guts, and stray feathers left behind by hundreds of thousands of dead chickens. Then, she heard a single loud pop.

A pipe weld in the plant had ruptured, filling the room with a white cloud of ammonia gas – a

chemical used to refrigerate meat that can be deadly in high doses. As other workers fled, Perkins lost consciousness and was trapped inside the plant for about forty minutes while the gas ravaged her eyes, throat, and lungs.

When a colleague finally dragged her outside, Perkins had red chemical burns on her face and leg. She heard a paramedic refer to her as "DOA" – dead on arrival. In the years since the 2016 accident, Perkins has undergone multiple throat surgeries and two cornea transplants, takes six kinds of eye drops, and suffers from chronic coughing fits that make it difficult to breathe, she said.

"It damaged every dang part of me," Perkins said of the ammonia. "I can't do what I used to do."

While Perkins' injuries were extreme, she was among dozens of employees of Tyson Foods, one of America's largest meatpacking companies, who have been injured in ammonia leaks over the last decade, a CNN investigation found.

Tyson plants have experienced at least 47 ammonia leaks between 2012 and 2021, leading to almost 150 worker injuries, according to CNN's analysis of previously unreported Environmental Protection Agency data covering facilities that store large amounts of hazardous chemicals. Of the 20 facilities that reported the most chemical release-related injuries to the EPA over that time period, five are Tyson meat plants, more than any other company.

Federal worker safety inspections have alleged poor maintenance or a lack of safety training at some Tyson plants where ammonia leaks injured workers. Tyson accounted for almost six in 10 of all ammonia-related injuries reported to the EPA by meat processing facilities – a

disproportionate share of injuries compared to the amount of ammonia its plants use. The company's ammonia injury count far outpaced its largest competitors.

Magaly Licolli, an activist in Arkansas who's advocated for workers at Tyson and other meatpacking plants, said the leaks are part of a pattern of the company putting "profits over the safety of the workers."

Austin Steele/CNN

Magaly Licolli, a workers rights advocate with the nonprofit Venceremos, poses in Springdale, Arkansas, in March 2023.

"It's unacceptable, it's inhumane," Licolli said. "We should start seeing these workers as humans and people – that their work is really essential for us to have food on our table."

In a statement, Tyson defended its record, arguing that it was more proactive than other companies in reporting ammonia accidents to the EPA.

"We greatly value the health and safety of our team members and take proactive measures to ensure a safe workplace and prevent workplace injury," wrote Tyson spokesperson Derek Burleson. "We take every injury seriously and work diligently to continuously improve our processes and make our facilities safer."

A decade ago, the federal government moved to address the problem. The Department of Justice sued Tyson in 2013 following a string of ammonia leaks, including one that killed a worker. The company signed a consent decree with the government, agreeing to pay a fine and conduct an independent review of the pipes in some of its plants, upgrading them when needed to prevent leaks.

But the federal government only included about two dozen Tyson facilities in the consent decree – leaving out the Arkansas plant where Perkins was severely injured three years later. Since the decree went into place, Tyson workers have continued to be exposed to the toxic gas, with some of the leaks that caused the most injuries taking place at plants that the consent decree overlooked.

CNN interviewed eleven current or former Tyson workers across three different plants who experienced ammonia leaks. They described lasting effects on their respiratory systems or struggles with mental health, and some said they received no prior training about what to do in the event of an ammonia leak.

In addition, CNN found one case in which Tyson reported far fewer injuries to the EPA than local officials documented. Tyson's report on the 2014 ammonia leak at another Arkansas plant lists just a single injury, but records from the local fire department say more than two dozen people were injured – a former worker described a terrifying scene with many of her colleagues vomiting, crying and struggling to breathe.

Ammonia is cheap and efficient – but toxic

Tyson, which reported $53 billion in sales in 2022, is one of America's largest meat processors. It employs 142,000 people, and produces one out of every five pounds of chicken, beef, and pork sold in the US, according to the company.

Anhydrous ammonia is a key chemical that Tyson and other meatpacking companies use to refrigerate their meat.

"Ammonia is a very efficient refrigerant and it's quite cheap," said Dr. Arch Carson, a University of Texas Health Science Center at Houston professor who has studied ammonia and other workplace chemical exposures for decades. "Most major refrigeration systems are designed using ammonia."

But ammonia is also toxic, and depending on the exposure can cause temporary blindness, eye damage, skin irritation, and serious lung injury to workers who come into contact with it, according to health experts.

"It sucks water out of anything it encounters," devastating the respiratory passages and eyes, Carson said, and with high enough exposures, "you can get death within seconds to minutes."

Austin Steele/CNN

Pipes run across the exterior of the Tyson Foods plant in Hope, Arkansas, where several people were injured in a 2016 ammonia leak.

Mark Lauritsen, an official with the United Food and Commercial Workers International Union, which represents some Tyson workers, recalled an ammonia leak while he was working at a non-Tyson meatpacking plant in Iowa during the 1980s. "We probably evacuated in less than 15 seconds and we still had people at the hospital," Lauritsen said. "That's how fast it can get you."

Facilities that store large amounts of hazardous chemicals like ammonia are required to file regular reports with the EPA documenting accidental releases and injuries as part of the agency's Risk Management Program. CNN obtained the database of reports from the Data Liberation Project, a new initiative that works to make government records more accessible, which requested it under the Freedom of Information Act and published it online.

Tyson has about 100 facilities across the United States that store enough ammonia to require reports to the EPA, with a combined inventory of more than 10 million pounds of the dangerous chemical, according to CNN's analysis of the agency's records.

Tyson plants stood out on the list of the facilities with the most injuries from accidental releases of any hazardous chemical, accounting for five of the top 20. No other company owned or operated more than a single facility among those 20 most dangerous locations.

In total, Tyson reported 146 ammonia leak-related injuries between 2012 and 2021 – about 57% of ammonia injuries reported at all meat processing facilities in that time period. But the company's locations only accounted for about 25% of the stored ammonia that the meat

industry reported to the agency.

View this interactive content on CNN.com

Five of its top competitors – Cargill, JBS, National Beef, Smithfield Foods, and Sysco – reported a combined total of 37 ammonia leak-related injuries over the decade, about a fourth of Tyson's injuries, even though their facilities reported holding slightly more ammonia in total than Tyson's plants.

Facilities that store 10,000 pounds or less of anhydrous ammonia are not required to submit reports under the Risk Management Program, so the data does not include accidents at those plants. Companies are generally required to file reports every five years, and also update those reports within six months of any chemical release that leads to an injury or has other consequences.

In his statement, Burleson, the Tyson spokesperson, said that the company has seen a decline in ammonia accidents in recent years. The fact that Tyson has reported more ammonia injuries than some of its competitors "only indicates that [Tyson] affirmatively identified more incidents to the EPA than other companies did," he said.

"We follow all federal regulatory requirements and fully investigate all ammonia-related incidents," Burleson said, adding that the company's investigations include "a root cause analysis and a corrective action plan."

In addition to worker injuries, some larger ammonia leaks at Tyson plants have led to evacuations or shelter-in-place orders in nearby communities. For example, one 2013 release in Arkansas led to 911 calls from local residents reporting breathing problems or eye irritation, and multiple people walking into hospitals, a fire department report showed. And a 2021 leak in Tennessee led to dozens of people being temporarily evacuated from a neighborhood near a Tyson plant, according to the local fire chief.

More broadly, data from the Occupational Safety and Health Administration shows that Tyson plants have received citations for more than 90 violations since 2012 related to the safe handling of chemicals or deficient trainings or warnings about hazardous substances, although some were later dropped in settlements between Tyson and the agency.

Employees who experienced ammonia leaks at Tyson plants, some of whom asked not to be

Employees who experienced ammonia leaks at Tyson plants, some of whom asked not to be named because they still work for the company, described serious injuries with medical or mental health impacts lasting years.

One Tyson worker who escaped an ammonia leak described a feeling she likened to a hand pressing on her chest, making it hard to breathe, ever since the incident. Another said that after he was exposed to ammonia, his eyes were so swollen that for weeks he struggled to drive or even watch basketball on TV.

Austin Steele/CNN

Shani Haynes, pictured in Texarkana, Arkansas, in March, was injured during the 2016 leak at the Hope plant.

Shani Haynes, who was working the night of the 2016 leak in Hope, Arkansas, that severely injured Perkins, remembered the intense anxiety she felt after returning to work the following day.

"I literally started having a panic attack and started crying, and did not want to go into the building," said Haynes, who has since left her job at Tyson. "I could still smell the smell."

Tragedy in Hope

The plant where Haynes and Perkins worked sits just outside the city of Hope – the birthplace of former President Bill Clinton, who used it as a driving metaphor in his political oratory.

Like many Tyson meat plants, the enormous industrial facility is an economic lifeline for a small rural town. It's the county's largest employer, and some families have worked there for generations: Haynes' mother cleaned the plant for decades before Haynes was hired.

Every weekday, approximately 268,800 live chickens arrive at the Hope plant, according to state records. They leave as nuggets, tenders and other packaged items destined for dinner tables and restaurants across the country. One poster on the fence of the plant proudly declares Tyson "McDonald's global supplier of the year," while another reads, "If it ain't Safe DON'T do it!!"

Austin Steele/CNN

A safety sign hangs on a fence at a Tyson plant in Hope, Arkansas, in March 2023.

Perkins started working at the plant in November 2015, a few months before the accident, as a sanitation worker on the night shift.

Around 3 a.m. on April 23, 2016, the weld on an end cap of a refrigeration pipe containing ammonia burst while Perkins and her fellow workers were cleaning the plant, according to Tyson's report to the EPA, as well as court and labor filings and witness accounts. Eight workers were injured, including Perkins.

Employees who experienced the leak described a terrifying rush to escape from the white cloud of ammonia gas, which made it hard to see or figure out where to go. Delfort Minor, who said he was saved by a bathroom break right before the leak took place, compared the chaos to an active shooter incident.

"All of the sudden, people come running out of the plant screaming and hollering," Minor said. "I thought somebody got shot."

Outside, as workers cried and gasped for air, they realized that Perkins was trapped inside. Eventually, Minor and other witnesses said, a colleague went back in and dragged her out of the building.

Minor, Haynes and another coworker told CNN that they had never been trained about what to do in the event of an ammonia leak before the incident took place, and that there had

been no alarm or warning about the release.

Courtesy Mimi Perkins/Jackson Law Firm

An undated photo of Mimi Perkins.

Burleson said Tyson "provides hazardous chemical training and emergency response training to all team members during onboarding and annually, so they are equipped with the understanding of what to do during chemical releases and other emergency situations."

Perkins was brought to a local hospital and intubated before being airlifted to a hospital in Little Rock, according to medical records. Photographs of Perkins in the hospital show her lips and tongue inflamed and her eyelids sealed shut in order to help her corneas heal. She had lesions on her body and a large chemical burn on her leg.

OSHA launched two inspections of the plant in the months after the incident. The investigations concluded that Tyson had not properly checked and inspected the welded end cap that burst, the plant didn't have an ammonia alarm, and employees were not trained on ammonia response and safety. In addition, according to OSHA, Tyson had years earlier conducted a safety review that led to recommendations that the company install ammonia detectors and upgrade piping in the Hope plant – but hadn't followed through on those suggestions.

"Ammonia piping with deteriorated coatings and extensive corrosion damage was allowed to remain in service," one of the citations stated.

The agency cited Tyson for 15 violations and fined the company $140,000. Tyson contested OSHA's allegations, and later settled with the agency and paid a reduced total of about $77,000, public records show. As part of the settlement, Tyson agreed to "install an employee alarm for chemical releases" and "retrain all affected employees" at the plant about "ammonia hazards."

Austin Steele/CNN

The plant where workers were injured in 2016 was several miles from downtown Hope, Arkansas, the birthplace of former President Bill Clinton.

Because Tyson paid for Perkins' extensive medical bills under the state's workers' compensation system, she was not able to sue the company for her injuries, according to her attorney, Jim Jackson. Instead, Perkins sued the refrigeration contractor that had done welding work on the pipe a few months before the incident.

The contractor argued in a legal filing that Tyson "was negligent in its maintenance and operation of the refrigeration system resulting in abnormal pressure of the ammonia." Perkins and the contractor later settled the lawsuit.

and the contractor later settled the lawsuit.

Burleson said that the Hope release was caused by the failure of the "weld from an outside contractor." Since the April 2016 incident, he said, the Hope plant has not experienced any ammonia releases that led to injuries or otherwise had to be reported to the EPA.

In the years since, Perkins' life hasn't been the same. She's unable to work, often shuttles between doctors appointments, and continues to have difficulty breathing and seeing. While she said the desire to get back to her six grandkids was her motivation for staying alive during her ordeal, she's now unable to chase them around or play with them like she once did.

"I can't go out there and mow my yard because I get short-winded or tired. You know, a lot of stuff I can't do that I used to could do," she said. "It just changed a lot."

Austin Steele/CNN

Delfort Minor, a former Tyson worker, says he suffered mental health impacts following the 2016 leak at the Hope plant.

Minor's injuries have been less visible. The truck driver said he has suffered nightmares about the incident in the years since, including dreams that he was trapped in a gas chamber.

"That event, it really plunged me into a darkness," Minor said, adding, "it will send thoughts to your mind that you don't want to be there."

Tyson's accident report doesn't tell the whole story

Tyson's reports to the EPA about ammonia accidents like the one that hurt Perkins and Minor portray a troubling picture of the company's safety record. But CNN found one example where the company may have undercounted the injuries caused by the toxic gas.

The company's report on the December 2014 leak at its "Chick-N-Quick" poultry plant in Rogers, Arkansas, a half-hour drive from Tyson's headquarters, portrayed a relatively minor incident: an equipment failure led to an ammonia leak that injured a single worker.

But local records and a worker who experienced the incident tell a different story.

A report from the Rogers Fire Department, which CNN obtained through a public records request, stated that 25 people were injured during the ammonia release and that emergency responders transported at least 11 workers to the hospital.

In addition, spokespeople for two local hospitals told news outlets that a total of 25 Tyson employees went to the hospital and were later discharged. The leak occurred when repairs on the refrigeration system led to ammonia being released into the building's ventilation ducts in the middle of the day, the fire department report said.

Martha Hernandez, a Mexican immigrant who was working at the plant packaging chicken tenders that day, said she was preparing to return to the factory floor after a bathroom break when a white cloud seeped into the changing room. She was rushed out of the factory by her supervisor, whose voice she could hear through a thick fog.

Austin Steele/CNN

Martha Hernandez, pictured in Springdale, Arkansas, says she still suffers breathing problems years after experiencing an ammonia leak at a Tyson plant.

When the exit door swung open, workers spilled out onto the plant's parking lot, which she said felt like an open-air hospital ward. Hernandez said she saw dozens of affected employees there, crying out in pain or strung out on the floor gasping for air. Hernandez, who was struggling to breathe, said she told her supervisor multiple times that she needed medical attention, but was rebuffed. "She kept telling me that the outside air would make me feel better," Hernandez recalled.

Hernandez, who no longer works for Tyson, still has medical challenges that she believes stem from the incident – she uses an inhaler three to four times a day to help her breathe and has visited multiple doctors to try to treat her lung ailments. She said Tyson should do more to train workers about the dangers of ammonia.

"I came here to have a better life," Hernandez said. "I think I'm worse today than if I were in Mexico."

In response to questions about the discrepancy between local reports of 25 injuries and Tyson's EPA report of a single injury, Burleson said that "transport to the hospital alone does not satisfy the criteria for a recordable injury" in EPA regulations. According to agency documents, companies are supposed to count anyone who requires medical treatment beyond first aid as an injury.

In addition, an employee at Tyson's plant in Amarillo, Texas, was "hospitalized after inhaling anhydrous ammonia" after a pipe broke in September 2017, according to an OSHA severe injury report. But Tyson did not report that incident to the EPA – even though it did report other accidents there in the following years. According to the EPA, facilities are required to report any accidental releases that result in injuries, regardless of how large the leak is.

Burleson said that "our records and other OSHA records indicate that no team member was hospitalized in connection with the Amarillo incident," citing an OSHA report about the accident that labeled it a "Non Hospitalized injury."

Paul Orum, an independent researcher who's used EPA data to write reports about chemical leaks, said that because the accident data is self-reported, there can be questions about its accuracy.

"Obviously that sounds like a concern," Orum said of the examples of Tyson potentially undercounting, but he added that it's unclear whether the EPA would take action to enforce rules ensuring report accuracy "unless it's part of a larger investigation."

Missed opportunity to solve problem

A decade ago, the federal government stepped in to protect Tyson workers from ammonia exposure. But for workers at some plants, the effort didn't go far enough.

In April 2013, following a string of ammonia leaks at Tyson plants, the Department of Justice and the EPA sued the company, arguing that it had violated the Clean Air Act. The complaint alleged a litany of infractions, such as inadequate safety training, defective ammonia alarms, and a lack of necessary maintenance to piping systems.

The same day the government filed the lawsuit, it also came to a consent decree with Tyson to address the problem. While Tyson didn't admit to violating the law, it agreed to conduct independent audits of ammonia storage policies at 23 of its plants to review safety training protocol and engineering practices and test certain piping, replacing it when needed.

Austin Steele/CNN

A Tyson feed mill towers over the city of Hope, where the company is the county's largest employer.

Tyson also paid a nearly $4 million fine and purchased $300,000 worth of equipment for local fire departments and first responders.

The consent decree stemmed from an investigation by the EPA's Region 7, which covers Kansas, Iowa, Missouri and Nebraska, according to agency spokesperson Melissa Sullivan. Plants in Arkansas and other states – like the ones in Hope and Rogers that later experienced leaks that injured workers – were excluded from the decree.

EPA officials focused on facilities in the four Region 7 states because they did not have evidence "that other facilities were experiencing the same level of noncompliance," and because Tyson plants "did not appear to have centralized environmental management," Sullivan wrote in an email.

In the decade since that agreement was signed, dangerous gas leaks have continued and Tyson employees have continued to be injured. In total, there have been at least 34 accidental discharges at Tyson plants since the mid-2013 settlement, leading to more than 85 worker injuries, the EPA data shows.

Notably, 2018 marked Tyson's second-highest reported ammonia injury count of the 2000s – and data for more recent years may be incomplete.

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In January 2017, during the last days of the Obama administration, the DOJ terminated the consent decree, saying in a filing that Tyson had certified that it had completed its side of the agreement.

The EPA reviewed the company's independent audits of its facilities "and was satisfied that the company was complying with its Risk Management Program requirements," Sullivan, the EPA spokesperson, said. Burleson also said that Tyson fully complied with the consent decree, and that the company performs frequent internal audits.

Still, some Tyson workers who lived through ammonia leaks said they wished more had been done to protect them.

"These are some dangerous chemicals that can take a person away from their families," said Minor, who, despite making it out, still struggles with the memory of the ammonia leak. "I will never forget that night."

Methodology

CNN used a copy of the EPA's Risk Management Program database from the Data Liberation Project, which obtained it through a freedom of information request and has published the data online. Only facilities that hold more than a designated amount of a hazardous substance – including 10,000 pounds of anhydrous ammonia – are required to file RMP reports. That means that the data doesn't necessarily cover Tyson plants or other meat facilities that hold smaller amounts of ammonia.

Facilities that hold more than the designated amounts are required to report any accidental releases that result in injuries, deaths, evacuations, sheltering in place, or significant property damage. CNN removed duplicate reports for accidents at the same facility on the same day, keeping only the most recently filed report.

To compare ammonia leaks at Tyson Foods plants with those at other meat processing companies, CNN reviewed facilities that reported having NAICS codes starting in "3116" – a classification that identifies businesses involved in animal slaughtering and processing. That included most of Tyson's facilities.

CNN chose to review accidents between 2012 and 2021 because 2021 was the last full year with data available. Because facilities only have to file RMP reports every five years and file additional updates within six months of an accident, data on accidents in 2021 is

incomplete. In addition, each facility's filing schedule is different, so some facilities have filed more recent reports than others.

When calculating the amount of ammonia held at meat processing plants, CNN used the most recent report filed by each facility.

No ammonia leak-related deaths were reported at Tyson Foods plants in the period CNN analyzed. Three other facilities using ammonia reported at least one death, and CNN counted those fatalities as injuries for comparisons between Tyson plants and other facilities.

CNN's Scott Bronstein and Daniel A. Medina contributed to this report. University of Central Arkansas journalism student Emily Kennard also contributed for CNN.

Subject: AIM Act Petition to Restrict HFC Substitutes Greater than 700 GWP for Cold Storage Warehouses
Date: Thursday, March 6, 2025 at 14:34:27 Eastern Standard Time
From: C.R. Hicks
To: newberg.cindy@epa.gov
CC: David M. (Max) Williamson
Category: ALTA
Attachments: image001.png, CUSER Petition AIM Act subsection (i) Cold Storage (3-6-25).pdf

Dear EPA,

Please accept the attached AIM Act petition on behalf of the Coalition for the Use of Safe and Efficient Refrigerants, Inc. (CUSER) regarding restrictions on the cold storage sector under EPA's "Technology Transitions" sector-ban rule. This petition is submitted under the authority of subsection (i) of the American Innovation and Manufacturing Act ("AIM Act"), 42 U.S.C. § 7675(i)(3), and EPA's implementing regulations at 40 C.F.R. § 84.62.

We also believe that EPA review of the Technology Transitions Rule is mandated by Section 3 of President Trump's Executive Order 14154, "Unleashing American Energy" (Jan. 20, 2025), which requires executive agencies to review existing regulations that conflict with key policies, including the policy at EO 14154 § 2(f) to "safeguard the American people's freedom to choose from a variety of goods and appliances . . . and to promote market competition and innovation within the manufacturing and appliance industries." Moreover, partial recission of the cold-storage sector restrictions are mandated by EO 14154 § 3(d), which requires EPA to terminate actions taken under various now-rescinded climate programs, which in turn includes EPA's unlawful interpretation of the AIM Act as a climate program.
Kindly confirm receipt of this petition by reply email. Please let us know if EPA requires any addition steps to formally lodge this petition.

Regards,

C.R. Hicks | Williamson Law + Policy, PLLC
1001 Connecticut Avenue NW, Suite 612 | Washington, D.C. 20036 | (615) 887-0738

Attachment 4

November 1, 2011. Ammonia leak in a storage tank at San Onorfre Nuclear plant. No injuries reported. Capture tank onsite reduced damage, but 30 gallons of ammonia reduced.

Aging Seniors: Avoid Eating Blueberries for Break

Ammonia leak at Calif. nuke plant prompts alert

By ABC7

Tuesday, November 1, 2011

IRVINE, Calif. (AP) - November 1, 2011

Workers stopped the leak by 5 p.m., about two hours after it was detected in a storage tank in the water purification system of Unit 3 at San Onofre Nuclear Generating Station, said Todd Adler, the plant's engineering manager.

The emergency alert was required because fumes could prevent access to certain areas of the plant, Adler told reporters at a media information center in Irvine, Calif. The alert was canceled at 6:07 p.m. and evacuated workers were allowed to return.

The leak was in the non-nuclear section of the plant, which is operated by Southern California Edison. No radioactive material was released, no injuries were reported and there was no danger to the public, the company said.

Approximately 30 gallons of leaked ammonia were collected in a basin underneath the tank that was designed for that purpose, Edison spokeswoman Lauren Bartlett said.

Electricity production at the plant was not affected, and other units remained fully operational, Adler said.

The plant is located about 45 miles north of San Diego, just south of San Clemente, and is jointly owned by Edison, San Diego Gas and Electric and the city of Riverside.

While not dangerous for the public or plant workers, an emergency alert at the power plant is an unusual occurrence.

"This is not normal," Edison spokesman Chris Abel said. "The last time we had one (alert) declared was May 1999, because of a suspected pipe bomb on the freeway."

MD: If You H
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TOP STC

Dozens sicken
outbreak linked

Loretta Swit, kr
Major Houlihan
Updated 41 minutes

Trump says he'
foreign steel
Updated 31 minutes

Trump gives El
sendoff
Updated 3 hours ag

PBS files suit a
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Updated 38 minutes

SF cold case b
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track and field

MORE T

2012. Winery worker died from ammonia following equipment use errors in Sacramento, CA. Multiple violations found and EPA fines imposed.

SANGER WINERY TO PAY $330K PENALTY IN 2012 FATAL AMMONIA INCIDENT (HTTPS://THEBUSINESSJOURNAL.COM/SANGER-WINERY-PAY-330K-PENALTY-2012-FATAL-AMMONIA-INCIDENT/)

Published On February 5, 2018 - 1:53 PM
Written By

The federal government has reached an agreement with a Sanger winery over a 2012 incident when an ammonia release led to the death of one of its workers.

Gibson Wine Co. will pay a $330,000 civil penalty and will be required to make a series of improvements to its facility valued at about $300,000, according to a news release. The agreement with the Department of Justice and U.S. Environmental Protection Agency resolves environmental violations related to the release of anhydrous ammonia.

"Facilities using extremely hazardous substances such as ammonia must abide by federal laws to protect the safety of workers, emergency responders, and the community to avoid such deadly or other serious accidental chemical releases," said Alexis Strauss, EPA's Acting Regional Administrator for the Pacific

Southwest. "This case is part of EPA's high-priority work to reduce the risks of accidental releases at industrial and chemical facilities through compliance assistance and enforcement of good chemical management practices."

More than 280 pounds of the volatile chemical were released in the September 2012 incident, when a temporary employee was exposed to the gas and asphyxiated. According to a report from the U.S. Occupational Safety and Health Administration, a cellar supervisor became distracted in conversation and inadvertently opened a valve that caused oil and liquid ammonia to discharge, forming a gas cloud that reached nearby common areas of the facility.

EPA performed an inspection of the facility in January 2013 and noted the following:

— The lack of readily available devices designed to prevent a release of ammonia from oil drain lines

— Inadequate operating procedures and insufficient employee training to assure that employees understand and adhere to the operating procedures.

— The lack of labeling that would allow operators to identify ammonia refrigeration system pipes and equipment.

Under the terms of the settlement, the company will install a computer control system for its anhydrous ammonia refrigeration system, with automated controls and alarms; move one of its ammonia refrigeration systems to a safer location that is farther away from employee bathrooms, offices, and a breakroom; conduct an audit of ammonia refrigeration equipment to identify any further improvements that Gibson Wine must undertake; and label refrigeration pipes and equipment.

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03.21.2018

Final Settlement on Winery Ammonia Death

Gibson Wine Co. settles with EPA after employee died in 2012 accident

by Jane Firstenfeld

A Fresno County co-op winery reached a final settlement with federal regulators regarding a 2012 accident in which a cellar worker died after being exposed to anhydrous ammonia.

Sacramento, Calif.—Gibson Wine Co., an agricultural cooperative in Sanger, Calif. agreed to a settlement with federal agencies following the death of a winery worker in 2012.

The government alleged that an accidental release of anhydrous ammonia violated the Clean Air Act, the Comprehensive Environmental Response, Compensation and Liability Act and the Emergency Planning and Community Right-To-Know Act.

“It’s a done deal,” said Sacramento attorney James T. Dufour, who represented Gibson in the federal lawsuit. Although the Environmental Protection Agency and U.S. Department of Justice had announced a settlement Feb. 5, Dufour declined to comment until a judge signed off on the consent decree, which includes $330,000 in fines to be paid in installments, as well as credit for capital improvements to the winery plant amounting to another $300,000.

Dufour noted that the second amount is really a positive: It’s safer for the environment and provides a much more efficient system and controls that will streamline the winemaking process. Originally, the government had demanded a total of almost $1.2 million, and co-op members feared the additional liability that might have come with a hearing not scheduled until 2020. He noted being able to pay the $330,000 in installments will lessen the financial impact on co-op members.

Founded in 1939, Gibson produces some 200,000 cases of wine per year by quantity, although much of the production is cooking wine shipped in bulk to restaurant chains in the U.S. and abroad.

When *Wines & Vines* interviewed Gibson general manager Wayne Albrecht in February, he said that the co-op had already reached a settlement with the victim’s family through the company’s workers’ comp insurance.

According to local news reports, Robert Munoz, 28, was working at the winery through a temporary staffing agency at the time of the accident but had periodically worked at Gibson Wine Co. since 2004. The incident, which occurred when a worker opened the wrong valve during a routine winery process and released 280 pounds of anhydrous ammonia, was attributed to human error.

“We’re not saying you can’t always improve,” Albrecht said. The process improvements now in place include a requirement that anyone working on equipment is licensed to do so. Refrigeration equipment, the source of the leak, was relocated, and a computer control monitor is already online. “We made a payment program with the Dept. of Justice and agreed to make improvements we were going to do anyway,” he said.

Albrecht had been working on the case since it began. The co-op is owned by Fresno County farmers, and when the incident happened, there were 37 participating members. That’s down to 19 currently. “They didn’t want to pay,” for the settlement, according to Albrecht.

August 13, 2016. Ammonia leak at Bronco Winery in Modesto, CA area following broken pipe. Employees evacuated and shelter in place issued for neighbors.

NEWS

Ammonia leak prompts evacuation at Bronco Winery

By Erin Tracy

etracy@modbee.com

Updated August 13, 2016 8:58 PM

Firefighters are decontaminated after working to contain an ammonia leak at the Bronco Winery near Ceres. *Modesto Fire Department*

Dozens of employees at Bronco Winery were evacuated Saturday afternoon when a pipe broke leading to an ammonia leak.

One home near the winery was also evacuated and a shelter in place order was issued for a few houses downwind of the winery on Bystrum Road south of Ceres, said Modesto Fire Department Division Chief Mike Lillie.

Ammonia is a skin and inhalation irritant that in high levels can cause serious injury, Lillie said.

A Hazardous Materials alarm was activated at the winery at 3:18 p.m. Employees reported seeing a cloud of ammonia around the outdoor pipe.

Plant workers were able to slow but not stop the leak before fire crews arrived on scene.

A 14-person Hazmat team made up of firefighters from the Modesto Fire Department, Turlock Fire Department and Stanislaus Consolidated Fire Protection District responded to the scene.

Two firefighters in fully encapsulated suits were tasked with turning off two valves that were within three feet of the leak on either side of it.

One valve was secured as of 7 p.m. A second team went in and secured the other valve about 8:15 p.m., fire officials reported. After securing the valves, the firefighters had to be decontaminated.

This story was originally published August 13, 2016 at 7:30 PM.

May 15, 2017. Ammonia leak at winery in Fresno, CA following maintenance on refrigeration line. 140 workers evacuated and at least one first responder injured.

CA Winery Ammonia Leak Hurts Firefighter

MAY 15, 2017 | INCIDENTS

An ammonia leak in Fresno, CA, at a winery prompted a response from Fresno Fire's HazMat crew.

The call regarding the gaseous release came in just before 8 a.m. Wednesday morning, at the E and J Gallo Winery in Southeast Fresno.

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"There are several, quite a number of large tanks of product that they have here equire refrigeration," said Deputy Chief Richard Cabral. "As we understand it were maintenance workers, working on a liquid ammonia line.

ammonia line is used to refrigerate the product they have here at Gallo. elieved that the line was empty; they had done an evacuation type of dure. Apparently, there was still ammonia in that line and it was urized."

Fire personnel went in and temporarily patched the line, later confirming ak had been mitigated.

"We have a report of a very small injury to a firefighter who was in on making the repair. Ammonia liquid is very caustic, and it's also a cryogenic. So, we understand that a very small amount was on his hand."

Officials consider the injury minor.

As first responders worked inside the facility, 140 workers evacuated the building and waited outside.

Officials add that there was no danger to the public, but those within the area closed off may have been at risk at the time of the leak.

May 18, 2019. Ammonia leak leads to death at Delta Packing Company, a cherry packing company in Lodi, CA. 5 others hospitalized and discharged. CDC and Cal/OSHA remarks about danger of ammonia. Ammonia used as part of refrigeration process.

https://www.lodinews.com/news/article_7810a676-793c-11e9-b705-d70f56410d52.html

Lodi resident dies following an ammonia leak at Delta Packing Company

By Oula Miqbel/News-Sentinel staff-writer
May 18, 2019

1 of 3

Delta Packing Company of Lodi, Inc. in Lodi Friday, May 17, 2019.
Bea Ahbeck/News-Sentinel

An ammonia leak at the cherry packing facility at the Delta Packing Company on Tuesday night is believed to have caused the death of 60-year-old Lodi resident Surjit Kaur Basra.

The California Division of Occupational Safety and Health — known as Cal/OSHA — was notified about the gas leak at 6:45 p.m. Tuesday, according to Annamarie Costamagna Reeves with Delta Packing Company.

"The appropriate agencies were notified about the leak once it was reported," Costamagna Reeves said.

Costamagna Reeves said Delta Packing Co. followed its emergency procedure after the leak was discovered and is assisting in the investigation.

Basra, along with five other employees, were sent to a hospital for medical care. All were hired through the Salinas Farm Labor Contractor.

Following Basra's death, the other five employees have returned to work.

Since Basra's death did not occur at the packing facility, local authorities are investigating her death.

In a statement, CAL/OSHA stated that it has opened an investigation with Salinas Farm Labor Contractor and Delta Packing Co.

"As far as Cal/OSHA investigations, they include interviews with the employer, supervisors, and employees, ... The investigator gathers whatever information they need to calculate and issue any citations for violations of applicable Title 8 workplace safety and health regulations," read the statement.

If CAL/OSHA recognizes that Delta Packing Co. violated any safety standards outlined in the CAL/OSHA emergency action plan, they can cite the company for general, regulatory or serious monetary penalties.

Once the investigation by CAL/OSHA is completed, employees have the right to appeal the citations. By appealing the citation employees can amend or uphold the penalties or citations if they do not agree with findings made by CAL/OSHA.

In addition to CAL/OSH's investigation, The San Joaquin Sheriff's office has also launched an investigation into Basra's death.

"This is an open investigation with the sheriff's department. We do not have any information at this time," San Joaquin County Sheriff Office POI Andrea Lopez said.

Basra had worked for the Delta Packing for years and was remembered for her diligence on the work floor by Costamagna Reeves.

"She (Basra) worked for us for a long time and she was always a hard worker. My heart goes out to her and I want to extend my condolences to her family," Costamagna Reeves said.

In an interview with the Stockton Record, Costamagna Reeves stated there was a situation where ammonia was released outside of a packing area.

When pressed further for details about the events that transpired at the packing facility, Costamagna Reeves stated, "We're working with the appropriate authorities and the situation is under investigation."

Delta Packing uses ammonia during the refrigeration process for its cherries.

Both the Center for Disease Control and OSHA have publicized how hazardous ammonia is. Ammonia is a toxic gas that can be fatal if it is inhaled.

According to the CDC website, ammonia gas can cause lung injury, and the liquefied gas for ammonia refrigeration can cause frostbite and corrosive injury to eyes and skin.

The CDC has declared that ammonia gas is a severe respiratory tract irritant.

Costamagna Reeves has been cooperating with agencies in an effort to provide a safe work environment for all of Delta Packing's employees.

"We take safety very seriously, and safety is our top priority," Costamagna Reeves said.

Cal/OSHA is expected to offer the results of their investigation of Salinas Farm Labor Contractor and Delta Packing in the next few months.

July 23, 2019. Ammonia leak at Paso Robles winery. Employees evacuated and leak fixed.

UPDATE: Ammonia leak under control at Paso Robles winery

Posted 8:45 AM, Jul 23, 2019 and last updated 8:49 AM, Jul 23, 2019

UPDATE (8:45 a.m.) – CAL FIRE SLO says the "very small leak" of anhydrous ammonia at Treasury Wine Estates is under control.

The problem was reportedly mitigated by employees at the facility.

CAL FIRE says all employees are safe and resources are being released from the scene.

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ORIGINAL STORY: Hazmat crews were responding to a reported ammonia

leak at a Paso Robles winery Tuesday morning.

CAL FIRE SLO says the call came in at around 7:38 a.m. from Treasury Wine Estates located on the 7000 block of Highway 46 East.

Employees reportedly evacuated and there are no reports of injuries.

At 8:15 a.m., CAL FIRE SLO said the leak had been stopped by employees.

A hazmat unit was requested at the scene as a precaution.

This story will be updated as information becomes available.

August 14, 2020. Ammonia leak at walnut processing facility in Orosi, CA. Employees evacuated and community sheltered-in-place. Hundreds of gallons of ammonia stored on site, but difficult for first responders to locate leak.

EMERGENCY OPERATIONS

Leaking Ammonia Disrupts Sleeping California Commu

August 14, 2020 • by IFW Staff (/authors/504428/staff) •

Fire trucks wait Thursday morning near Orosi, California, as the source of leaking ammonia is traced.

Screencapture Via KFSN

Nearby residents reported a leak of anhydrous ammonia from a walnut processing facility in central California Thursday morning, local media report.

The GSF Nut Company near Orosi keeps hundreds of gallons of ammonia stored on site. Leaking ammonia presents an inhalation hazard, Fire Captain Joe Rosa told KFSN.

Firefighters had difficulty locating the actual leak. Meanwhile, residents in nearby homes were told to shelter-in-place.

Read more about Anhydrous Ammonia (/tags?tag=anhydrous+ammonia)

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The fire took the Singapore Civil Defence Force (SCDF) 20 emergency vehicles and about 70 firefighters to extinguish.

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July 6, 2021. Leak in Bakersfield, CA at Crystal Geyser Water Bottle Company. Facility and neighboring apartments evacuated. No injuries reported and leak fixed.

Ammonia leak at bottle water facility in East Bakersfield

Photo by: 23ABC

By: John Madden, 23ABC

Posted 7:14 PM, Jul 06, 2021 and last updated 8:54 PM, Jul 06, 2021

BAKERSFIELD, CA. (KERO) — Bakersfield Fire is currently investigating a reported ammonia leak at Crystal Geyser Water in East Bakersfield.

The call came in around 4:30 pm Tuesday. The location of the building is by California Ave and MLK Blvd.

BFD says the smell of ammonia made its way outside of the building and not only forced an evacuation of the facility, but several nearby apartments.

However, workers inside acted quickly and isolated the leak. No injuries were reported.

Ammonia is a chemical that is toxic to breathe and can burn your skin.

Read More

It is advised to avoid the area. BFD doesn't expect any more evacuations but says crews are still working to fix the leak.

September 9, 2021. EPA announced settlements with 4 facilities in Central Valley for ammonia facility and use violations. Facilities included ice cream makers, ice storage, and vegetable processers. Fines totaled more than $800,000 for CAA violations.

U.S. EPA Penalizes Four California Facilities More Than $800,000 for Clean Air Act Chemical Safety Violations

Under settlements, facility owners will pay fines, make safety improvements

September 9, 2021

Contact Information
Joshua Alexander (alexander.joshua@epa.gov)
415-972-3258

SAN FRANCISCO - The U.S. Environmental Protection Agency (EPA) has announced settlements with four companies for alleged violations of Clean Air Act chemical release prevention requirements at four anhydrous ammonia facilities in Central California. The companies will pay more than $826,000 in civil penalties and make safety improvements to their facilities, with the goal of protecting the public and first responders from dangerous chemicals.

Anhydrous ammonia can cause serious, often irreversible health effects when released. In addition to potential harmful effects from inhalation of or skin contact with this substance, it is highly flammable. Anhydrous ammonia is considered an extremely hazardous substance.

“It is paramount that facilities properly manage the handling of extremely hazardous substances to prevent dangerous incidents,” **said EPA Pacific Southwest Regional Director of Enforcement and Compliance , Amy Miller**. “Industry needs to properly manage dangerous substances or face significant Clean Air Act penalties.”

Details on the Settlements

A September 2019 EPA inspection of the Dreyers Grand Ice Cream Inc. facility located in Bakersfield, California, found the company failed to: comply with process safety and hazard evaluation requirements; correct deficient equipment; manage change requirements; comply with compliance audit requirements; and submit accurate hazardous chemical reports for anhydrous ammonia.

Dreyers paid a penalty of $301,066 and improved process safety by: adding machinery room signage, panic hardware, and an eyewash and safety shower; moving machinery room ammonia sensors; adding labeling; and improving machinery room emergency ventilation. The company also corrected deficient equipment and addressed outstanding recommendations from hazard evaluations and compliance audits.

An April 2018 EPA inspection of the Kern Ice and Cold Storage LLC. facility in Bakersfield, California found the company failed to: identify hazards and conduct an adequate hazard review; design and maintain a safe facility; and minimize the consequences of a release.

Kern Ice agreed to a civil penalty of $115,012 and will make modifications to the facility to improve safety. These will include adding labeling, improving equipment access, installing emergency stop switches, and improving machine room ventilation.

A June 2018 EPA inspection of Dole Fresh Vegetables Inc., owned by Dole Foods LLC and located in Marina, California, found the company failed to design and maintain a safe facility. Dole Fresh Vegetables also did not comply with process safety, hazard evaluation, and operating procedure requirements.

Dole Fresh Vegetables paid a penalty of $206,621 and made modifications to the facility to improve safety such as installing physical barriers around ammonia piping, improving machinery room ventilation, and improving emergency shutoff valve access. The facility also corrected deficient equipment, addressed outstanding hazard evaluation recommendations, and updated operating procedures.

A June 2018 EPA inspection of the Dole Packaged Foods LLC. owned by ITOCHU Corporation and located in Atwater, California, found the company failed to: comply with process safety, hazard evaluation, operating procedure, and training requirements; correct deficient equipment; and develop and implement an adequate emergency response plan.

Dole Packaged Foods paid a civil penalty of $203,445 and installed physical barriers around ammonia pressure vessels and piping. The company also agreed to update operating procedures and ammonia operator training, conduct a mechanical integrity audit and address the audit's recommendations, conduct an emergency response team drill, and address outstanding action items from previous drills.

About Anhydrous Ammonia

Thousands of facilities nationwide make, use, and store extremely hazardous substances, including anhydrous ammonia. Catastrophic accidents at ammonia refrigeration facilities—historically about 150 each year—result in fatalities and serious injuries, evacuations, and other harm to human health and the environment. EPA inspected these facilities as part of the Agency's National Compliance Initiative, which seeks to reduce risk to human health and the environment by decreasing the likelihood of accidental releases and mitigating the consequences of chemical accidents.

June 28, 2023. Two hospitalized following ammonia leak in refrigeration at lettuce growing facility in Tehachapi, CA. 21 of 70 employees exposed.

Latest News

30th May 2025

Ammonia leak sends two to hospital

28th June 2023

Panasonic develops automatic recovery system

JAPAN: Panasonic has developed an automatic fluorocarbon recovery system for air conditioning units with

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Women in Cooling video winners announced

EUROPE: Chloe Jennings, an apprentice with UK contractor Delta T Refrigeration, has won this year's RACHP Best Practice Mastery category of the Women in Cooling Video Competition.

30th May 2025

USA: Two people were admitted to hospital today (June 28) following an ammonia leak at a lettuce growing business in Tehachapi, California.

Kern County firefighters were summoned to to the premises of Revol Greens where leak alarms had prompted pre-developed emergency protocols and evacuations of staff.

Twenty-one of the 70 employees at the facility had been exposed to the ammonia used in the refrigeration systems of the 16-acre facility. Two required treatment and were transported to a local area hospital.

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October 5, 2023. Winery in Fresno, CA area evacuated due to ammonia leak. Ammonia used on site for manufacturing, but source of leak not initially clear.

LOCAL NEWS

HAZMAT responds to winery leak in east Fresno

by: Alyssa Saldivar
Posted: Oct 5, 2023 / 02:04 PM PDT
Updated: Oct 5, 2023 / 02:04 PM PDT

HAZMAT responds to winery leak in east Fresno

FRESNO, Calif. (KGPE/KSEE)- HAZMAT responded to a potential hazard at a winery on Olive and Clovis avenues that may have a potential leak of ammonia according to the Fresno Fire Department.

Workers at E.&J. Gallo Winery reported an incident smell of ammonia. The facility does claim to use ammonia at its site for manufacturing. Joshua Sellar, with the Fresno Fire Department, confirmed that a HAZMAT team is on the scene.

Sellar says the HAZMAT team is working to determine how big the leak is and what appropriate actions are going to need to be taken. Fresno Fire Department says the employees of the facility have been evacuated to an area of safe refuge in the meantime.

number. When he picked up, it was his

An emergency team is on-site in case decontamination is needed in the event of an emergency for the team in the site. Fresno Fire will monitor the area to detect any ammonia gas; if there is, they will shut down the facility to make sure the ammonia leak is out.

No injuries were reported. Anyone with any more information is asked to contact the Fresno Fire Department.

Suggest a Correction

October 13, 2023. 11 hospitalized in Orange County business park due to ammonia leak. At least 12 others decontaminated. Cause of leak unknown. Close proximity to Knott's Berry Farm.

2 dead, nearly 40 injured i

Nearly 50 injured when ca
Liverpool soccer parade

15 injured in Fla. boat exp

Pump to the beat: Top son
CPR compressions

Hazmat

11 hospitalized after ammonia leak at Calif. business

11 patients from the Orange County hazardous materials incident are listed in stable condition

October 16, 2023 10:22 AM

Associated Press

BUENA PARK, Calif. — An ammonia leak at a Southern California business sent 11 people to the hospital Friday morning, authorities said.

The leak was reported shortly before 9:15 a.m. in a commercial building in Buena Park, the Orange County Fire Authority said.

The building was evacuated and 12 people were decontaminated, with 11 being sent to hospitals where they were in stable condition, the fire authority said.

A hazardous materials team determined that the chemical released was ammonia, firefighters said.

https://twitter.com/OCFireAuthority/status/1712873890677248151

Exposure to high levels of ammonia in the air can irritate the skin, eyes, throat and lungs and cause coughing and burns, according to the U.S. Centers for Disease Control and Prevention.

There was no immediate word on what caused the leak.

Hazmat leak under investigation

Harmful, Dangerous Chemical Leak Occurs Near Popular California Theme Park

Posted on October 13, 2023 by Emmanuel Detres

Credit: Knott's Berry Farm

A dangerous chemical leak occurred less than two miles from Knott's Berry Farm theme park. Government and law enforcement officials are working hard to contain the leak. Here's what you need to know.

MY VIDEOS

Credit: Knott's Berry Farm

Related: *Guest Banned From Getting on Disney World Attraction After Unusual Discrimination*

Knott's Berry Farm – Harmful and Dangerous Chemical Leak Exposes Orange County in California

Less than two miles from Knott's Berry Farm theme park in Orange County, California, a poisonous and dangerous ammonia leak has just occurred, leaving nearly a dozen people hospitalized. According to a breaking news report from KTLA5, high ammonia levels at an industrial facility in Buena Park leaked out this morning as law enforcement officials and government officials attempted to contain the leak.

According to KTLA5, Orange County Fire Authority crews were called to the building in the early morning hours to the block of 6500 Cabellero Boulevard. Thankfully, the facility was quickly evacuated without the authorities understanding

what the employees had been exposed to.

This commercial park is located less than two miles from Knott's Berry Park theme park and resulted in about a dozen workers being decontaminated and assisted by paramedics on the scene. Out of those dozen, eleven were transported to a nearby hospital and are said to be in stable condition, according to authorities. There is no reason as to the cause of this harmful ammonia leak, but an investigation is currently being conducted.

For those looking to visit the theme park today or tonight should be made aware of this chemical leak and keep in mind that:

> **The Centers for Disease Control and Prevention (CDC) notes that exposure to airborne ammonia can result in skin, eye, throat, and lung irritation, leading to symptoms such as coughing and burns. In severe cases, when individuals are exposed to extremely high concentrations, it can potentially lead to lung damage and, in the most extreme instances, even fatalities.**

Credit: Knott's Berry Farm

March 21, 2024. Ammonia leak leads to 7 hospitalized in Modesto, CA. Unclear source of leak.

7 people taken to hospital after Modesto ammonia leak, fire department confirms

The fire department declared a multiple casualty incident

Updated: 4:22 PM PDT Mar 21, 2024

Lindsay Weber ✉
Digital producer

MODESTO, Calif. — An ammonia leak at a Modesto business sent multiple people to the hospital on Thursday, according to the fire department.

Crews responded to the chemical leak at Paleteria La Michoacana on Lapham Drive just before noon.

Officials said multiple people were outside the business with respiratory irritation, so crews declared a multiple casualty incident.

Multiple patients were triaged and treated on scene, the fire department said. A total of seven people

were taken to local hospitals.

Officials have not said what led to the ammonia leak.

TOP PICKS

Quick-thinking 9-year-old calls 911 to rescue mom and baby during medical crisis

Tiny horses, big price tags! In 1986, these adorable mini horses cost as much as a luxury car

Mushroom-tripping hikers mistakenly report a companion's death, officials say

November 4, 2024. Ammonia leak at poultry farm in Sangar, CA following refrigeration fan failure. Employees evacuated and shelter in place imposed. Alerts in English only.

LOCAL

Ammonia leak reported at troubled Pitman Farms poultry plant in Sanger

By **Melissa Montalvo**

Updated November 4, 2024 3:04 PM

SANGER

Pitman Farms poultry processing reported an ammonia leak Monday morning, forcing dozens of workers to evacuate the site in Sanger.

Several streets near the plant were blocked off as of late Monday morning including, Almond and K, Edgar and K and Cherry and J streets.

Sanger Fire Department Chief Greg Tarascou was not available for comment as of Monday afternoon at 1:15 p.m. as he was on the scene responding to the plant leak. But a Facebook post from the Sanger Fire Department at 8:18 a.m. confirmed the potential health hazard.

“Residents in the area may smell some ammonia in the air. We are advising residents in the area to shelter in place for now. Please turn off any air conditioners if you smell ammonia and stay inside if you can,” Sanger Fire Department said in a Facebook post at 8:18 a.m. Monday.

Fresno Fire Department was also at the scene. Department Spokesperson Joshua Sellers told The Bee that the leak was initially reported at 3 a.m. and the Fresno Fire hazmat team was requested around 5:45 a.m.

“We have the hazmat team, which is engine one and ladder one, hazmat rig and the battalion chief. They were all called out,” Sellers said.

Sellers could not confirm if any workers or firefighters were injured or hospitalized.

Sanger City Manager Nathan Olson said in a phone call that the incident was isolated to the plant and didn’t pose a threat to the general public. He said crews with specialized equipment were responding and he referred specific questions to Tarascou.

Pitman Farms processing plant in Sanger is one of the city's largest employers. The company is known for raising and processing humanely raised poultry sold under the brands Mary's Chicken, Mary's Turkey and Mary's Duck.

A February Fresno Bee investigation prompted by a workplace death found the company had a higher-than-average rate of injuries compared to similarly sized poultry processing plants nationwide.

Pitman Farms executives did not immediately respond to request for comment via email.

Mary's Chicken product, seen for sale in a Fresno grocery store photographed Thursday, Jan. 4, 2024. Sanger's Pitman Family Farms supplies chickens sold by the Mary's Chicken label. ERIC PAUL ZAMORA

ezamora@fresnobee.com

One worker who spoke with The Bee on condition of anonymity described what she experienced when she arrived for her shift at 9 a.m. “It smelled and my head hurt, my throat was burning, my tongue was numb and I felt nauseous,” she said in Spanish. “There were many of us who felt that way.”

The employee had heard that an ammonia tank exploded, but The Bee has not independently verified the claim.

Meat processors and other industrial food operations often use large amounts of ammonia in their refrigeration systems.

Federal health and safety regulators consider ammonia a “high health hazard” because it is corrosive to the skin, eyes, and lungs. Ammonia is one of the top three chemicals that causes worker injuries, according to an analysis of U.S. Environmental Protection Agency data.

The smell of ammonia mixed with poultry was strong near Edgar Avenue and K Street, to the east of the processing plant, as of late Monday morning.

The neighborhood to the east of the plant has several homes, day cares and an apartment complex.

The intersection of J Street and Edgar Avenue in Sanger, California are blocked off following an ammonia leak at Pitman Family Farms poultry plant on Nov. 4, 2024. Melissa Montalvo *Fresno Bee*

Nearby Sanger residents unaware

Yolanda Gomez lives on a block that neighbors the processing plant. She said she wondered what was going on when she noticed some workers in reflective gear on her block earlier that morning.

“I looked out the window and saw two men at the corner of the street,” she said in Spanish.

She was unaware of the ammonia leak until her husband and daughter alerted her, likely because they saw the fire department’s Facebook post, which was only available in English.

Gomez said: “If someone doesn’t know English, how would they know?”

A man walking his dog two blocks east of the plant said he was unaware of the ammonia leak or shelter in place order. He wondered why the streets were blocked

off and said it often smells around the plant.

A Pitman Farms poultry line worker who lives near the plant was outside washing down his blue smock around 10 a.m.

Speaking with The Bee on condition of anonymity, he said he started his shift around 1:30 a.m. About an hour later around 2:30 am he said, workers were taken outside. He recalled firefighters arrived shortly after. Workers were then told “this is going to take a while” and sent home.

Droves of poultry workers were seen leaving the plant around 10:30 a.m.

Pitman Farms workers gathered outside the poultry processing plant’s main entrance on Nov. 4, 2024. Sanger Fire Department responded to an ammonia leak at the plant on Monday morning. Melissa Montalvo *Fresno Bee*

Two workers told The Bee they were told to return at 1 p.m.

This isn't the first ammonia leak at Pitman Farms.

August 3, 2016, Ammonia leak at Bronco Winery in Modesto, CA area following broken pipe. Dozens of employees evacuated and shelter in place issues for neighbors.

According to the EPA, two dozen workers were hospitalized between 2014 and 2016 following three toxic ammonia leaks at the processing plant.

This story was originally published November 4, 2024 at 1:44 PM.

Related Stories from Fresno Bee

LOCAL

How did Mary's Chicken poultry worker drown in waste pit? Report reveals 'infuriating' details

September 14, 2024 5:30 AM

Melissa Montalvo *The Fresno Bee* 559-212-4425

Melissa Montalvo is The Fresno Bee's accountability reporter. Prior to this role, she covered Latino communities for The Fresno Bee as the part of the Central Valley News Collaborative. She also reported on labor, economy and poverty through newsroom partnerships between The Fresno Bee, Fresnoland and CalMatters as a Report for America Corps member.

LOCAL NEWS

Cause of ammonia leak at Pitman Farms revealed by Sanger Fire

by: John Houghton
Posted: Nov 6, 2024 / 11:29 AM PST
Updated: Nov 6, 2024 / 08:13 PM PST

SANGER, Calif. (KSEE/KGPE) – The Sanger Fire Department revealed the cause of an ammonia leak at Pitman Farms in Sanger Monday.

At around 3 a.m. on Monday, fire crews were alerted to a potential hazardous materials incident involving anhydrous ammonia at Pitman Farms at 1489 K Street in Sanger.

Fire crews say when they arrived, employees from Pitman Farms had already been evacuated and

emergency crews met with facility representatives to determine the extent of the ammonia leak.

Fire officials say the ammonia was isolated in a large freezer room within the facility. It was determined that an accidental failure of a fan within the cooling unit inside the freezer failed, causing the ammonia release.

During the incident on Nov. 3, Sanger Fire said a mutual aid request was made for a level one hazardous materials team, and the Fresno Fire Department responded to assist in the mitigation

efforts.

Due to the ammonia smell in the surrounding neighborhood, shelter-in-place advisement was issued for those in the immediate area.

Emergency crews say they continued to make entry into the hazardous space, performed air monitoring of the affected and surrounding areas, and utilized ventilation techniques to keep the public safe while the ammonia dissipated.

Suggest a Correction

January 23, 2025. Ammonia leak at Pacific Coast Producers in Oroville, CA. 6 sent to hospital following evacuation and shelter in place.

https://www.actionnewsnow.com/news/ammonia-leak-in-oroville-evacuation-warnings-shelter-in-place-lifted/article_bfc7a514-d9b7-11ef-b356-7fb5df28e2af.html

Ammonia Leak in Oroville: Evacuation Warnings & Shelter in Place Lifted

Matt Wreden

Jan 23, 2025

OROVILLE, Calif. - The ammonia leak at Pacific Coast Producers in Oroville has been mitigated. Cal Fire says all evacuation warnings and shelter in place orders have been lifted.

Mitchell Avenue will remain closed between Veatch Street and the railroad tracks until further notice. Please avoid the area.

Six individuals, including civilians and staff, are being evaluated at Oroville Hospital after being exposed to ammonia, officials said.

This is a developing story. Action News Now will keep you updated with new information on-air and online.

Ammonia leak prompts evacuations in Oroville neighborhood

by Adam Robinson
Thu, January 23rd 2025 at 10:32 AM
Updated Thu, January 23rd 2025 at 7:48 PM

An officer with the Oroville Police Department speaking with Cal Fire officials while at the scene of an ammonia leak at Pacific Co

TOPICS: HAZMAT INCIDENT OROVILLE AUTHORITIES HAZARDOUS MATERIALS POLICE D

OROVILLE, Calif. — As of 1:45 p.m., Cal Fire Butte Unit said the at Pacific Coast Producers off Mitchell Avenue has been mitiga warnings and shelter-in-place orders have been lifted.

However, Cal Fire said Mitchell Ave. will remain closed betwee railroad tracks until further notice.

At around 10:26 a.m., the Oroville Police Department (OPD) re 1600 block of Mitchell Avenue to voluntarily evacuate followin incident. The incident involved a slow valve leak releasing amr Producers, prompting the evacuation of a neighborhood direc Public Information Officer Keliecia Riley said the evacuation w with respiratory issues.

n affected residents living near Veatch Pomona, and Pine Street and Pomona roads were closed, including 3rd Street at Mitch Avenue, Pom

Gray Street and Pomona Avenue, Pine Street and Pomona Ave
Pine Street. They have since reopened.

A road closure sign near Mitchell Avenue in Oroville, Calif., following a reported ammonia leak at Pacific Coast Producers on Thursday, Jan. 23, 2025. (KRCR)

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To report errors or issues with this article, please email the editorial team.

MORE TO EXPLORE

Family of 5-year-old boy found in Klamath River speaks out about tragic loss

Are you ready to buy the dip? Are you sure?

Old Costco site in Redding to become retail hub with new businesses

April 11, 2025. Riverside, CA. Cold storage wherehouse evacuated following refrigeration system malfunction. 8 sent to hospital and 9 others exposed. Valve on roof failed and directed ammonia back into building. Leak was fixed.

Ammonia leak at Riverside warehouse sends 8 to hospital

By BRIAN ROKOS | brokos@scng.com | The Press-Enterprise

UPDATED: April 11, 2025 at 5:06 PM PDT

Eight employees at a cold-storage warehouse in Riverside were hospitalized Friday morning, April 11, after a malfunction in a refrigeration system sent the smell of ammonia into the building, authorities said.

Nine others at Lineage Integrated Solutions at 1001 Columbia Ave. reported exposure to the ammonia just before 6 a.m., the Riverside Fire Department said. All 17 were expected to recover, a news release said.

Their injuries were not described, but typical symptoms of exposure to ammonia include breathing difficulties and eye and nose irritation.

Nicholas Crain, a spokesman for the Riverside County Department of Environmental Health's hazardous materials unit, said a check valve on the roof unit wore out, and an evaporator blasted air with the ammonia into the warehouse.

The amount of ammonia was at a low level, Crain said.

Lineage's maintenance contractor fixed the leak, Crain said.

No firefighters were reported injured.

Originally Published: April 11, 2025 at 5:03 PM PDT