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August 21, 2023

Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

RE: Chapter 173-443 WAC Hydrofluorocarbons (HFCs) and Other Fluorinated Greenhouse Gases Rule

On behalf of potato farm families, thank you for the opportunity to comment on Chapter 173-443 WAC Hydrofluorocarbons (HFCs) and Other Fluorinated Greenhouse Gases Rule.

Our family potato farms will produce almost 9 billion pounds of potatoes on 155,000 acres in 2023. That harvested crop is used in minimally processed applications--for example, the production of frozen french fries, potato chips, and dehydrated potato products such as instant mashed potatoes. We also have robust fresh potato production which supports a resilient food security presence, domestically and around the globe. A significant portion of our crop is stored under controlled temperature conditions, safely using Hydrofluorocarbons, so that a potato harvested in October of 2023 can then be packed or processed in June/July 2024.

After reviewing the provided information for the Proposed WAC Revisions, a large portion of our family farms will be impacted. Current wording indicated that cold storage warehouses larger than 50lbs of refrigerant will be affected. All systems currently designed in the current market are of higher value as shown in Table 1.

Table 1 - Approximate Charge Per Horsepower

Compressor HP	Lbs. of Refrigerant
25	200
30	200
35	250
40	250
50	300
60	300
70	350
80	350
90	400

This new ruling would require as of January 1, 2025, all new systems would need to be less than 150 GWP. Currently on the market and coming to the market there are very few options as shown in Table 2.

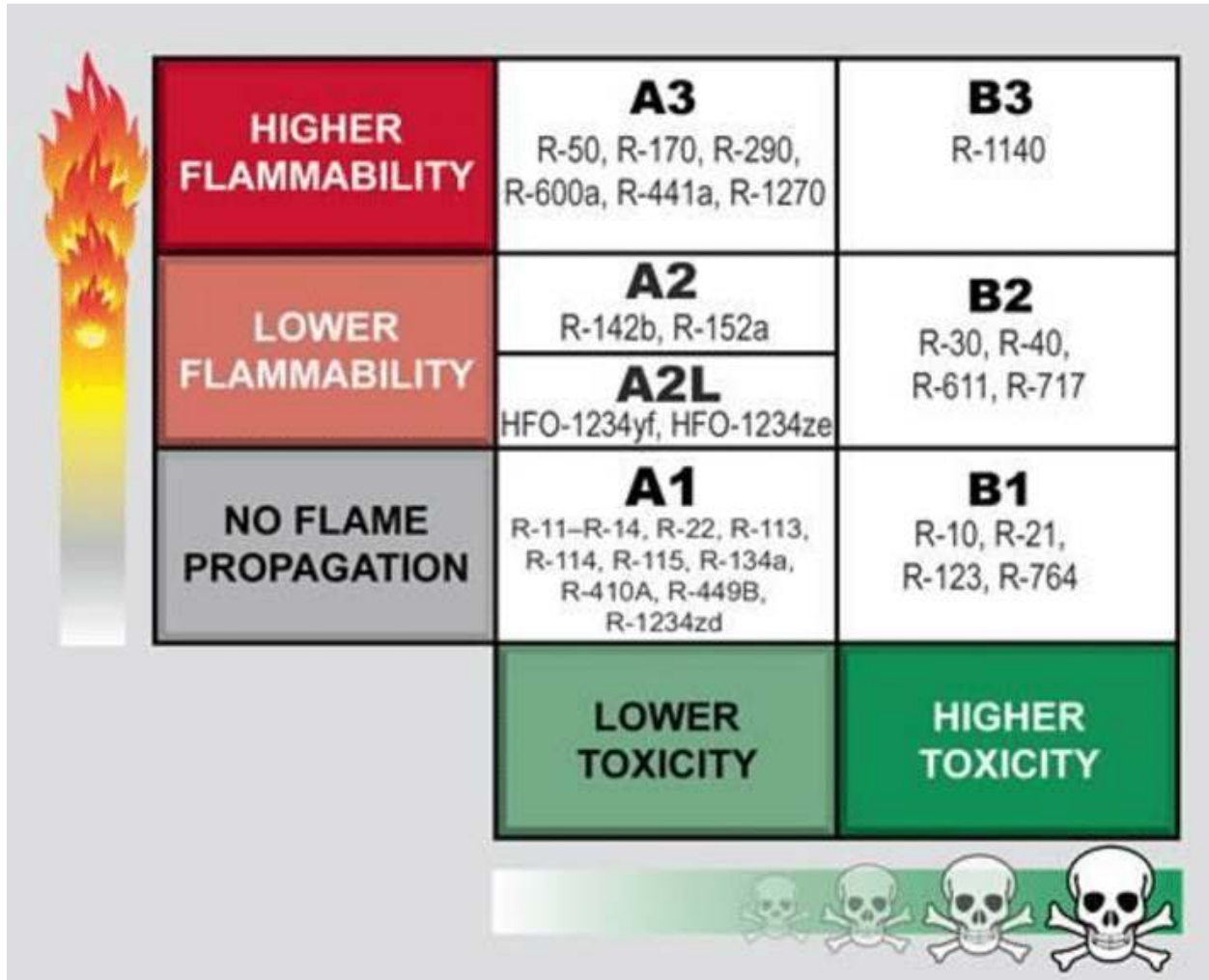
Table 2 – Less than 150 GWP Refrigerants.

Refrigerant Type	Manufacturer	GWP	Refrigerant Classifications	Designed to Replace
Ammonia R-717	Multiple	0	B2L	R-404a and R-22
CO2 (R-744)	Multiple	1	A1	R-404a, R-22, R-134a
R-454c	Chemours	146	A2L	R-404a like systems
R-455A	Honeywell	146	A2L	R-404a like systems
R-471A	Honeywell	148	A1	R-134a like systems

Data according to Compressor Manufacturer Bitzer

There is no official regulation that allows for current code adoptions and certifications from UL body and ASHRAE 15 to allow for A2L refrigerants at large scale use. Current systems must be approved by each individual authority having jurisdiction. Also, there is no ability to retrofit old systems that fall outside the scope of UL 60335-2-89 to the new refrigerants. Past retrofits for refrigerant types such as R-22 or 404a systems have utilized A1 class refrigerants and will no longer be available for new systems. These new A2L types coming available for the 150 GWP threshold are high risk due to the mild flammability, toxicity, or pressure shown in Figure 1.

Figure 1

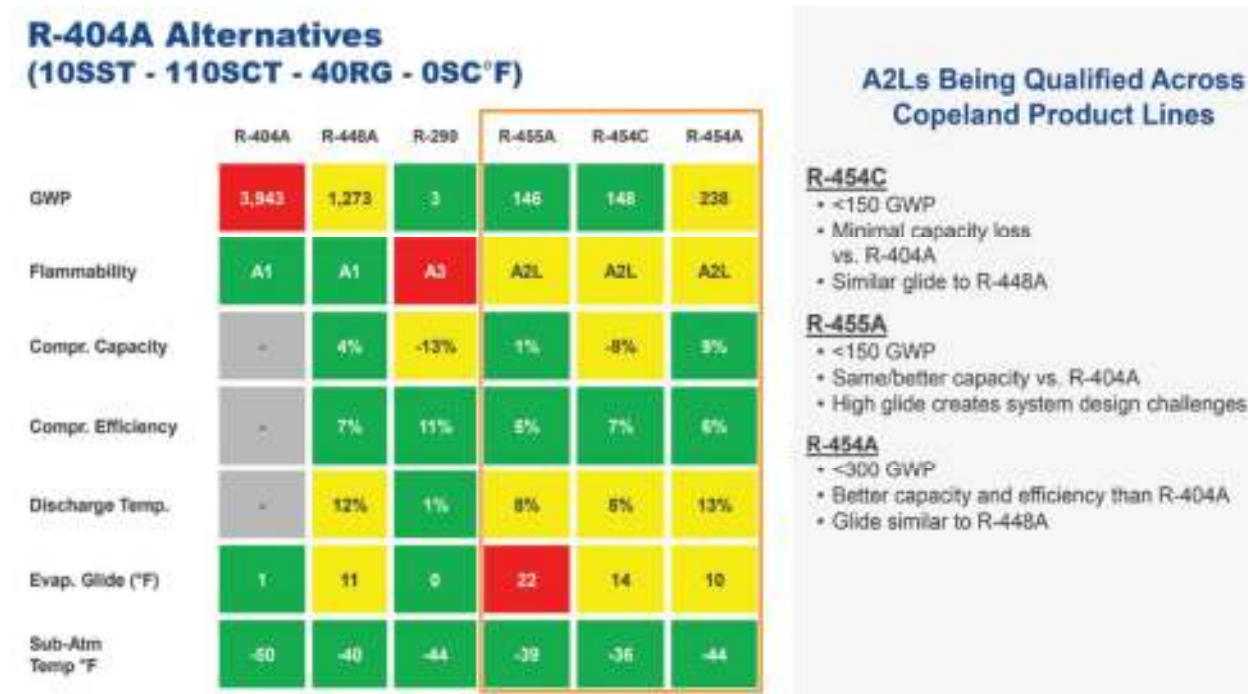


https://www.researchgate.net/figure/Classification-of-Refrigerants_fig4_344663841

Currently out of all the alternative refrigerants that meet the 150 GWP, only ammonia and CO₂ are available for commercial purchase. Issues with CO₂ are its significantly high pressure which requires thicker wall pipes and higher cost for components. Loss of charge is a high probability if the systems are shut down or there is a power outage. Ammonia is a toxic refrigerant that cannot be used with copper piping with potential hazards to personnel if a leak occurs. Since storage seasons are intermittent in duration an A2L class refrigerant is the best option.

When looking at what has been utilized in the potato industry there are limited options other than CO₂ and ammonia. Figure 2 shows the current alternatives which are not yet available commercially on the US market. One note is that R-290 is refrigerant grade propane and is limited to 500grams (1.1lbs) of refrigerant and is not a viable option.

Figure 2 – Alternative refrigerants



<https://www.achrnews.com/articles/147293-waiting-for-a2ls-in-commercial-refrigeration-equipment>

As for the Refrigerant Management Program, this is like what the State of California already requires. Owners will need to retain all documentation of what refrigerant has been installed and in what quantity. A licensed and certified technician will need to provide how much refrigerant was charged in the system and the type of approved leak testing performed. The main issue for the potato industry is that the system, if not used year around, requires a leak check within 30 days of system start-up. Subsequent leak checks are required every 3 months of operation to verify no leaks until the system is turned off for the season. All records of service work with refrigerant charges and leak checks must be kept for 5 years. In the event of a leak, repairs must be made within 14 days unless a technician or parts are not available then there is a 45-day allowance.

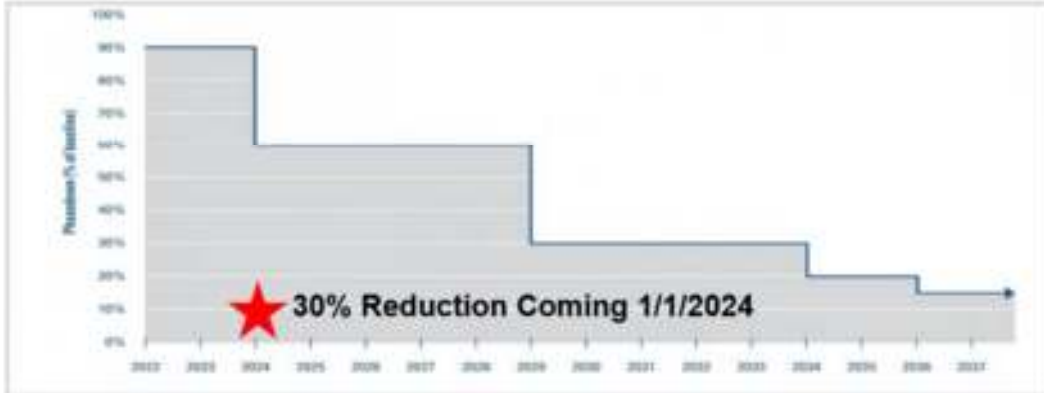
In California, a single refrigeration system is defined by a single refrigerant circuit. This is how they document their fee structure for larger and multi-circuit systems. Washington Chapter 70A.60 RCW only defines a refrigeration system but does not clarify the designation of individual or multiple refrigerant circuits per refrigeration system. This technically could allow for multiple circuits at 200lbs per circuit and keep the system total at 200lbs to 1,499lbs and cost only \$170 per system under their fee structure.

Additional impacts not listed in the proposal is the federal AIM act which requires a reduction of refrigerant production by 30% next year for all manufacturers of high GWP refrigerants. This goes into effect January 1, 2024, as shown in the phase down schedule in Figure 3.

Figure 3

The American Innovation and Manufacturing Act

AIM Act Phase Down Schedule - CO₂ Equivalent Basis



We would strongly recommend that the State of Washington delay any decision until the federal rule is finalized in October of 2023.

As the draft rule language is presented it would add an undue burden to our family farms and US food security as we produce 20% of the US supply of potatoes. It would be extremely difficult to adopt these rules and would lead to the demise of our \$7.3 billion dollar economic contribution employing over 31,000 jobs to the State.

Sincerely,

Matt Harris
Director of Governmental Affairs
Washington State Potato Commission