

# A-Gas V9

December 29, 2022

A-Gas



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# **A. PROJECT OVERVIEW**

## A1. PROJECT TITLE

A-Gas V9

## A2. PROJECT TYPE

Industrial Process Emissions – Use of Certified Reclaimed HFC Refrigerants

## A3. PROOF OF PROJECT ELIGIBILITY

Table 1: Eligibility Requirements

Criterion	Requirement	Proof of Project Eligibility
<b>Start Date</b>	Non-AFOLU Projects must be validated within 2 years of the project Start Date.	Project Start Date of August 5, 2020 *Per Errata (May 05, 2022): Start Date validation can be within 3 years if it occurs at a facility that has been visited during a successful validation and verification for another project of this same type and registered on ACR by the same Project Proponent.
<b>Minimum Project Term</b>	The Minimum Project Term for specific project types is specified in the relevant ACR sector standard and/or methodology. Project types with no risk of reversal subsequent to crediting have no required Minimum Project Term.	There is no risk of reversal for this project type.
<b>Crediting Period</b>	Crediting periods for all projects (except Fire Suppressants) are 15 years. Crediting period for Fire Suppressant projects will be 40 years.	The crediting period is 40 years.
<b>Real</b>	GHG reductions and removals shall exist prior to issuance. ACR will not forward issue nor forward register a projected stream of future offsets.	GHG reductions take place at the displacement of virgin HFC production, which takes place prior to the issuance.

<b>Emission or Removal Origin</b>	Project Proponent shall own, have control, or document effective control over the GHG sources/sinks from which the emissions reductions or removals originate. If the Project Proponent does not own or control the GHG sources or sinks, the Proponent shall document that effective control exists over the GHG sources and/or sinks from which the reductions/removals originate.	A-Gas holds and retains title to the HFC Fire Suppressant from the purchase through reclamation, up until the sale of the AHRI certified reclaimed.
<b>Offset Title</b>	Project Proponent shall provide documentation and attestation of undisputed title to all offsets prior to registration, including chain of custody documentation if offsets have ever been sold in the past. Title to offsets shall be clear, unique, and uncontested.	A-Gas has provided documentation of undisputed title to all offsets. Title to offsets is clear, unique, and uncontested.
<b>Land Title</b>	For U.S. projects, Project Proponent shall provide documentation of clear, unique, and uncontested land title. For international projects, Proponent shall provide documentation and/or attestation of land title; ACR may require a legal review by an expert in local law. Land title may be held by a person or entity other than the Project Proponent, provided the Project Proponent has clear, unique, and uncontested offsets title.	Not applicable to project type.

<p><b>Additional</b></p>	<p>Every project shall use either an ACR--approved performance standard and pass a regulatory surplus test or pass a three--pronged test of additionality in which the project must: 1) exceed regulatory/legal requirements; 2) go beyond common practice; and 3) overcome at least one of three implementation barriers: institutional, financial, or technical.</p>	<p>This project passes the regulatory surplus test and the ACR--approved practice--based performance test.</p> <p><i>Regulatory Surplus Test:</i> The project is not mandated by any existing law, regulation, statute, legal ruling, or other regulatory framework.</p> <p><i>Practice--Based Performance Standard:</i> A review of US EPA's reclamation data indicates that the HFC Fire Suppressant sector has a low market adoption rate for using certified reclaimed HFCs.</p>
<p><b>Regulatory Compliance</b></p>	<p>Projects must maintain material regulatory compliance. To maintain material regulatory compliance, a project must complete all regulatory requirements at required intervals. Project Proponents are required to provide a regulatory compliance attestation to a verification body at each verification. This attestation must disclose all violations or other instances of noncompliance with laws, regulations, or other legally--binding mandates directly related to project activities.</p>	<p>This project maintains material regulatory compliance for the entire reporting period.</p>

<b>Permanent</b>	For projects with a risk of reversal of GHG removal enhancements, Project Proponents shall assess risk using an ACR--approved risk assessment tool.	There is no risk of reversal of GHG removal enhancements for project type.
<b>Net of Leakage</b>	ACR requires Project Proponents to assess, account for, and mitigate certain types of leakage, as summarized in relevant sector standards and approved methodologies. Project Proponents must deduct leakage that reduces the GHG emissions reduction and/or removal benefit of a project more than any applicable threshold specified in the methodology.	Projects involving certified reclaimed HFC Fire Suppressant would not increase demand for refrigerant beyond current baseline demand, i.e., use of more reclaimed refrigerant would not cause an increase in virgin HFC production (to the contrary), or increase refrigerant emission rates. Therefore, for this project, "leakage" can be disregarded.
<b>Independently Validated &amp; Verified</b>	ACR requires third--party validation and verification, by an ACR--approved Validation/Verification Body (VVB), at specified intervals to issue ERTs. Governing documents for validation and verification are the ACR Standard, relevant sector standard, relevant methodology, and the ACR Validation and Verification Guideline.	This project will be validated and verified by third-party, ACR-approved, ANAB Accredited Verification Body, First Environment.



<b>Community &amp; Environmental Impacts</b>	ACR requires community and environmental impacts to be net positive overall. Project Proponents shall document in the GHG Project Plan a mitigation plan for any foreseen negative community or environmental impacts and shall disclose in their Annual Attestations any negative environmental or community impacts or claims of negative environmental and community impacts.	There are no negative community or environmental impacts for this project type.
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### A3. LOCATION

Wood County, Bowling Green, Ohio USA Latitude: 41.391210 Longitude: -83.671190



## A4. BRIEF SUMMARY OF PROJECT

### Description of Project Activity:

A-Gas US Inc's Voluntary Emission Reduction Project A-Gas V9 involves the recovery, reclamation, re-sale, and use of ASTM standards certified HFC fire suppressants (ASTM D6231 for HFC-125 and ASTM D6064 for HFC-227ea) to service/re-charge existing and newly manufactured fire suppression equipment in the US. The benefit of using reclaimed HFCs is that it avoids future production of virgin high GWP HFCs and subsequent GHG emissions.

### Background Information:

A-Gas purchases HFC fire suppressants from domestic sources from fire suppression systems being decommissioned, serviced, or retrofitted. A-Gas has a long history of buying and reclaiming used fire suppression agents to avoid the need for virgin material and to be a reputable source for critical users of HFC fire suppressants.

### Project Purpose and Objective:

The purpose for nearly 30 years, A-Gas has specialized in offering a wide variety of fire protection agents across the United States—from Halon, HFC, and Clean Agent purchasing, recharging, recycling, and recovery. This is done by the A-Gas Fire Protection sales force, technicians, and transportation specialists. The fire suppressant buyback program makes it quick, easy, and ensure we are always in line with the latest compliance regulations. With years of knowledge and expertise, we can support any order across the country at any time, day, or night. The objective of this project is to offset the production of virgin HFC fire suppressants creating GHG emissions by implementing the recovery, reclamation, and the reselling of used HFC fire suppressants thereby resulting in emission reductions.

## A5. PROJECT ACTION

### Description of prior physical conditions:

Our project actions occur within the USA & did not result in the release of GHGs outside of this geography. All recovery, reclamation, and sale activities have occurred and have contributed to emission reductions that will undergo verification by an independent verifier.

- We ensure that our technicians, our equipment, our record keeping, and our operational activities on and off site meet the necessary Section 608 requirements of the Clean Air Act obligations for Stationary Refrigeration and Air Conditioning; this will ensure that we are further preventing and minimizing venting of emissions throughout our processes.

### Description of how the project will achieve GHG reductions and/or removal enhancements:

The project will achieve GHG reductions by reducing the need for and reliance on the import and manufacture of virgin high GWP HFCs for servicing existing and new refrigeration, domestic, and industrial air conditioning equipment that continue rely on HFCs for their operation.

Description of project technologies, products, services, and expected level of activity: **An overview of the project technologies and flow incorporating key activities are summarized below.**

The entire HFC volume for this project was sent to A-Gas in Bowling Green, Ohio by multiple domestic customers. The HFCs were being used in fire suppression systems, in a variety of sizes if fire suppression system bottles. The HFCs arrive in their fire suppression system bottles that are then collected into A-Gas bulk tanks for reclamation through the tower and/or column.

A-Gas arranges the logistics from the customer's site to A-Gas in Bowling Green, Ohio.

The HFCs are then sent through the distillation towers for additional reclamation back to industry specifications. The main purpose of this process is to blend lower purity, reclaimed HFCs back to industry specifications to be packaged and resold back to the market. By following this process, A-Gas is continuing the use of reclaimed HFCs, avoiding the need for virgin HFCs to be produced and introduced into the fire suppressant industry.

### **The Towers System Overview**

The distillation column operation along with the associated tanks is for cleaning, separating and/or, reclaiming halons and refrigerants. The process uses many types of storage tanks such as feed tanks, storage tanks, or reclaim tanks from clients. The reclaim tanks from clients are pumped into larger tanks for cleaning operations using a column or mobile air removal system (MARS). The MARS unit is a separate process of the operation used for degassing and will not be covered in this document. The columns are used to perform the separation of different halons or refrigerants by using their individual temperature properties as a means of separating them. After the halons or refrigerants are cleaned or separated, the productions are stored in storage tanks.

### **General Description of the Distillation Column Process**

The distillation process starts with a feed tank that supplies a refrigerant to the middle position (or any position) of the column where some of it will immediately boil off to gas and some will flow as liquid to the reboiler tank at the bottom of the column. The reboiler tank at the bottom of the column contains an electric heater element that is used to heat the refrigerant in the tank to create gas that will flow up the column to the condenser. The condenser is part of an external refrigeration system that has a condensing cooling coil in the condenser tank where gas will form back to a liquid. The liquid in the bottom of the condenser tank is collected for a set time value and then some of the liquid refrigerant is sent via the reflux valve to the receiving tanks as top product. The rest of the product that is in the condenser is sent through the reflux valve back into the column as reflux gas. The reflux gas will go through the heating and cooling process multiple times where only a small amount will be sent to the receiving tank. On the bottom of the reboiler tank is a recirculation pump that pumps product

continuously through a desiccant filter back into the bottom of the reboiler. A small amount of the product that is recirculated will be collected into a separate set of receiving tanks and this product is called bottoms product.

### **Post Reclaim & Separation Testing**

Upon reclamation and/or separation via our distillation towers, samples are taken from the various tanks to be tested by our in-house AHRI Certified Laboratory or sent away for testing by an AHRI 700 certified laboratory, National Refrigerants, Inc. (NRI). The sample(s) must meet or exceed ASTM Standard certification requirements for the specific HFC. If these requirements are not met, then additional processing will be required until the ASTM specifications are met. Unlike AHRI, ASTM does not require testing or certifications – only the specifications in the published standards need to be followed.

### **Packaging & Shipping to Aftermarket**

Once the various bulk tanks have been successfully reclaimed and certified to meet ASTM specification, the reclaimed HFC fire suppressants are repackaged in 30 Lb – 2,000 Lb cylinders, ready for resale. The most common way A-Gas repackages HFC fire suppressants are in recharged fire suppressant system bottles from a variety of manufacturer, refurbished by A-Gas in Bowling Green, Ohio. All reclaimed fire suppressants are retested and ASTM Certified by the individual fire suppression system bottle serial number after packaging.

Each ASTM Certificate of Analysis is attached to the individual cylinders of reclaimed HFC that is then shipped by 3<sup>rd</sup> party logistics carrier directly to the customer.

## **A6. EX ANTE OFFSET PROJECTION**

The following is the GHG emission reduction and removal enhancements from the reporting period stated in tonnes CO<sub>2</sub>e.

Table 2: EX ANTE Emission Reductions

		Baseline reclaim rate		2.00%			
2020 Vintage	Refrigerant Type	Lbs Reclaimed and Sold	Annual Consumption (kgs)	10-yr Emission Rate	GWP	Emission Reductions	Rounded Emission Reductions
	HFC-125	23,866	10,825	100%	3500	37,131.213485	37,131
	HFC-227ea	81,887	37,143	100%	3220	117,209.359941	117,209
		105,753				154,340.573426	154,340

## **A7. PARTIES**

Project Proponent & Reclamation Facility: A-Gas

A-Gas is one of the world leaders in the supply and life cycle management of specialty chemicals such as refrigerants, hydrocarbon blowing agents, and clean agent fire protection. A-Gas offers a full range of environmental services for the recovery and reclamation of environmentally sensitive products such as CFCs, HCFCs, HFCs, Halons and associated products. Our decades of experience, depth of knowledge, and commitment to environmental solutions is unrivaled in the industries we serve.

Project activities for A-Gas V9: A-Gas has reclaimed and sold all quantities of HFCs that makeup this project to customers in the fire suppression industry. A-Gas retains all environmental rights and benefits for all material from purchase through the resale. This applies to all ERTs that it has registered with ACR. A-Gas is responsible for contracting validation and verification services.

A-Gas Personnel Roles and Responsibilities:

- 1) Sandra Hoffman – Project Documentation & Development
- 2) Terri AuFrance – Point of Contact for Fire Protection Sales
- 3) JoLynn Schrader – Accounts Receivable for A-Gas / Sales Packets

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## **B. METHODOLOGY**

## **B1. APPROVED METHODOLOGY**

This project will be certified according to ACR Standard, Version 7.0. It will also follow the rules and calculations as described in ACR's methodology: Methodology for the Quantification, Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Certified Reclaimed HFC Refrigerants, Propellants, and Fire Suppressants 2.0.

## B2. METHODOLOGY JUSTIFICATION

This project tracks source, reclamation, and sale documentation for the use of certified reclaimed HFC fire suppressants to quantify emission reductions from displacing the production and eventual emissions of virgin HFC fire suppressants. The chosen methodology provides the quantification framework for the creation of carbon credits from the reductions in GHG emissions resulting from the use of certified reclaimed HFC fire suppressants. In Table 3, eligible segments, and sectors relevant to this project are highlighted.

**Table 1: Eligible Sectors and Segments**

PROJECT ACTIVITY	ELIGIBLE SECTOR	ELIGIBLE SEGMENTS IN SECTOR
Use of Certified Reclaimed HFC Refrigerants, Propellants, and Fire Suppressants	Domestic Refrigeration	Residential refrigerators and freezers
	Commercial Refrigeration, also known as Retail Food Refrigeration	Equipment used to store and display chilled and frozen goods for commercial sale such as in supermarkets, convenience stores, bakeries, and restaurants. This equipment includes centralized supermarket systems, remote condensing units, and stand-alone equipment (e.g., beverage vending machines, stand-alone display cases).
	Cold Storage Warehouses	Storage for meat, produce, dairy products, and other perishable goods.
	Industrial Process Refrigeration	Chemical, pharmaceutical, petrochemical, and manufacturing industries, industrial ice machines and ice rinks.
	Transport Refrigeration	Refrigerated truck trailers, railway freight cars, ship holds, and other shipping containers.
	Mobile Air Conditioning	Automobiles, trucks, buses, and other motor vehicles.
	Stationary Air Conditioning	Comfort cooling for homes and commercial buildings, including multi-family buildings, office buildings, hospitals, universities, shopping malls, airports, sports arenas.
	Aerosols (Propellants)	Medical aerosol devices, consumer aerosol devices, technical aerosol devices
	Fire Suppression	Flooding agents, streaming agents

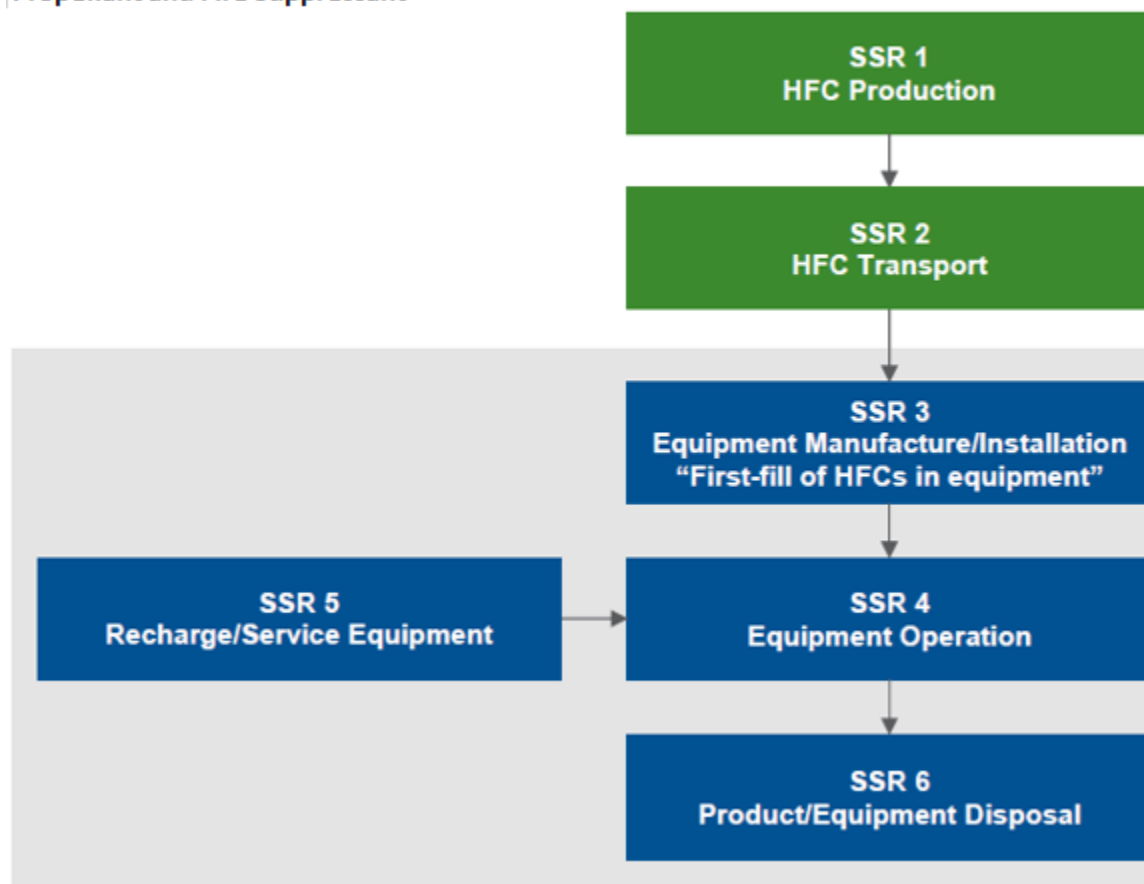


### B3. PROJECT BOUNDARIES

**Physical boundary:** The physical boundary is A-Gas located at 1100 Haskins Road in Bowling Green, Ohio 43402. A-Gas is an EPA certified refrigerant reclaimer. It is the physical and geographical site where the recovered HFC refrigerant is reclaimed in the project for use in equipment operations and servicing/recharging to replace HFCs that leaks or to charge newly manufactured fire suppression equipment.

**Temporal boundary:** Per the methodology, projects shall have one reporting period not to exceed 12 months in length. Per the ACR Standard, the project Start Date is the date on which the project began to reduce GHG emissions against its baseline. The reporting period for this project is August 5, 2020 through December 30, 2020. This is one reporting period that is less than 12 months in length, which complies with the temporal boundary stated in the methodology.

**Project Boundary Diagram for Certified Reclaimed Refrigerant, Propellant and Fire Suppressant**



## B4. IDENTIFICATION OF GHG SOURCES AND SINKS

Table 4: Greenhouse Gases and Sources

SSR	SOURCE DESCRIPTION	GAS	INCLUDED (I) OR EXCLUDED (E)	QUANTIFICATION METHOD
1 HFC Production	Fossil fuel emissions from the production of HFCs	CO <sub>2</sub>	E	N/A
		CH <sub>4</sub>	E	N/A
	HFC leaks during HFC production	HFCs	E	N/A
2 HFC Transport	Fossil fuel emissions from transport of HFCs	CO <sub>2</sub>	E	N/A
		CH <sub>4</sub>	E	N/A
		N <sub>2</sub> O	E	N/A
	HFC leaks during transport	HFCs	E	N/A
3 Equipment Manufacture and Installation	Emissions of HFCs during manufacture or installation of equipment or system or product "First-Fill Emissions"	HFCs	I	Equation 1
4 Equipment Operations	Fossil fuel emissions from the operation of the equipment or system	CO <sub>2</sub>	E	N/A
		CH <sub>4</sub>	E	N/A
		N <sub>2</sub> O	E	N/A
	HFC leaks from the operation of the equipment or system or product	HFCs	I	Equation 1
5 Service Equipment	Fossil fuel emissions from servicing equipment or system to replace leaked HFC	CH <sub>4</sub>	E	N/A
		N <sub>2</sub> O	E	N/A
	HFC emissions from servicing equipment or system to replace leaked HFC	HFCs	I	Equation 1
6 Equipment Disposal	Emissions from the disposal of the equipment at end-of-life	HFCs	I	Equation 1

## B5. BASELINE

The baseline scenario comprises the emissions that would take place without the use of certified reclaimed HFC fire suppressant. It is equal to the total amount of reclaimed HFC fire suppressant produced and the subsequent sale, title-transfer or return to the fire suppression industry during the reporting period. In the absence of this project, most of the refrigerant used to recharge a system would have come from virgin HFC production along with some small portion of reclaimed HFCs (current reclamation rate).

The baseline HFC refrigerant reclamation rate is provided in the methodology and is set at 2%.

## B6. PROJECT SCENARIO

For this project, A-Gas purchases HFC fire suppressants from domestic sources from fire suppression systems being decommissioned, serviced, or retrofitted. A-Gas has a long history of buying and reclaiming used fire suppression agents to avoid the need for virgin material and to be a reputable source for critical users of HFC fire suppressants. A-Gas has specialized in offering a wide variety of fire protection agents across the United States—from Halon, HFC, and Clean Agent purchasing, recharging, recycling, and recovery. This is done by the A-Gas Fire Protection sales force, technicians, and transportation specialists. The fire suppressant buyback program makes it quick, easy, and ensure we are always in line with the latest compliance regulations. With years of knowledge and expertise, we can support any order across the country at any time, day, or night. The objective of this project is to offset the production of virgin HFC fire suppressants creating GHG emissions by implementing the recovery, reclamation, and the reselling of used HFC fire suppressants thereby resulting in emission reductions.

A-Gas receives the HFC fire suppressants, recovers the HFCs reclaims to ASTM standards for resale into the fire suppression aftermarket. A-Gas specializes in aggregating, reclaiming, and mixing HFCs. With knowledge and expertise regarding the relationship between refrigerants, oil, and contaminants, as well as the operation of fire suppression systems. Additionally, A-Gas has an AHRI Certified Laboratory onsite in Bowling Green that follows the ASTM standard specifications for each HFC fire suppressant.

A-Gas took title to the HFC fire suppressant upon delivery and retained title throughout the transportation and reclamation processes. A-Gas sold the certified reclaimed gas to various fire suppression industry companies to go into the fire suppression aftermarket. According to the methodology, it is assumed that any fire suppressant sold or otherwise transferred from the reclaimers will be used. The sale of reclaimed refrigerant to A-Gas customers, displaced the production and eventual emissions of virgin HFC gas.

## **B7. REDUCTIONS AND ENHANCED REMOVALS**

All HFCs that are produced will eventually reach the atmosphere unless destroyed. Currently, there is little incentive to reclaim and reuse HFC fire suppressants because of the low costs associated with virgin HFC production. Using reclaimed HFCs effectively displaces the use – and therefore avoids production and eventual emissions – of virgin HFCs. Within the existing reclamation industry, there is capacity to significantly increase reclaimed fire suppressant use. Thus, using reclaimed HFCs results in a GHG reduction. Reclaimed HFCs can be used both to “charge” newly manufactured equipment and systems, and to “charge” systems that leak during normal operations.

## **B8. PERMANENCE**

There is no risk of reversal of GHG removal enhancements for project type.



## **C.**

# **ADDITIONALITY**

## **C1. REGULATORY SURPLUS TEST**

There are no requirements on the quantities of reclaimed HFC refrigerants that must be used for any application. Users are free to choose virgin HFC, stockpiled HFC, recycled or reclaimed HFC fire suppressants in any amount of their choosing. There are regulatory requirements pertaining to certification of the equipment used to recover ODS refrigerants for servicing equipment and the service technicians that handle ODS refrigerants, as well as certification requirements for refrigerant reclaimers. These regulatory requirements must be complied with as part of projects involving HFC fire suppressants for this project.

There is currently little incentive for recovery, reclamation, and re-sale of HFC refrigerants. Based on U.S. EPA data on reclamation of HCFC-22 (for which there is a strong incentive to recover and reclaim), and industry information, the percentage of available HFCs that are reclaimed in the U.S. is extremely low.

A-Gas continually monitors any changes in refrigerant policy and, where necessary, actively engages with regulators and registries when changes are being proposed to HFC regulations.

We conform to all laws relating to the handling of HFCs and our recovery technicians hold the necessary EPA 608 licenses. All processing equipment used to process refrigerants follows local, state, and federal requirements.

## **C2. COMMON PRACTICE TEST**

Not applicable for A-Gas V9

## **C3. IMPLEMENTATION BARRIERS TEST**

Not applicable for A-Gas V9

## **C4. PERFORMANCE STANDARD TEST**

A market adoption analysis laid out in the methodology was conducted for the relevant HFC refrigerant sectors and segments. Review of US EPA's reclamation data indicates that the sectors and segments have a low market adoption rate for using certified reclaimed HFCs. Therefore, project activities within these sectors and segments qualify for offset credit creation under this Methodology.

## **D. MONITORING PLAN**



## D1. MONITORED DATA AND PARAMETERS

### Monitoring Plan

#### A-Gas Personnel Roles and Responsibilities:

- 1) Sandra Hoffman – Project Documentation & Development
- 2) Terri AuFrance – Point of Contact for Fire Protection Sales
- 3) JoLynn Schrader – Accounts Receivable for A-Gas / Sales Packets

#### GHG Management System Requirements:

- 1) All records for purchases, processing, and sales are kept at the Bowling Green, Ohio facility.
  - a. These are both hard copies and electronically store
  - b. Records are retained for a minimum of 7 years unless otherwise required
- 2) The methods used to generate data include accessing reports from the A-Gas inventory system, Cyltrak. This program tracks material from the time it enters the facility, through processing, packaging, and sale. This data is captured in real time and monitored daily by operators and Finance Inventory Control.
  - a. Within the system, there are identifiers that allow the tracking of material through purchase order numbers, reference numbers, lot numbers, serial numbers, batch numbers, and order numbers.
  - b. Manual entry sheets are required at each step of the data entry process. These manual entries are done while the information is input into the inventory system.
  - c. Data is checked/audited by several departments that have access to the Cyltrak system: Operations, Logistics, Quality Control, Finance, and Environmental Services. The documentation begins with Operations recording weight and material transfers and laboratory testing. This paperwork is then supplied to Quality Control to verify the weights and laboratory testing prior to passing the documents to Logistics for shipping. Once Logistics includes the bill of lading with the documentation, it is turned over to Finance for invoicing. Finance maintains ownership of process documentation and, once again, verifies refrigerant volumes that are processed for invoicing. Environmental Services utilizes all relevant information, discussed above, to verify that process documentation is complete including operations paperwork, quality control documentation including certificates of analysis, Logistics bills of lading, and Finance invoicing. This process documentation is then reviewed by at least two people within Environmental Services to validate refrigerant weights and information used to calculate GHG emission reductions.
- 3) All A-Gas scales are calibrated quarterly & equipment inspected regularly
- 4) Quality Control ensures the refrigerant has met ASTM standard specifications based on lab sampling.
  - a. Samples of the material are turned into the AHRI Lab throughout the processing of the material.
- 5) Project implementation occurs once a reporting period has been established with all relevant data mentioned above is captured and completed.

<i>Data or Parameter Monitored</i>	$VR_{HFC, j, rp}$
<i>Unit of Measurement</i>	kg
<i>Description</i>	Total quantity of virgin HFC refrigerant j that would have been used to recharge equipment during the reporting period, derived from the quantity of monitored certified reclaimed HFC refrigerant that is documented according to the methodology.
<i>Data Source</i>	Purchase orders, operating records, & sales packets
<i>Measurement Methodology</i>	Reclaimer weighs the individual containers of reclaimed HFC refrigerant using calibrated weight scales
<i>Data Uncertainty</i>	Low
<i>Monitoring Frequency</i>	Determined once per reporting period
<i>Reporting Procedure</i>	Purchase orders, operating records, & Sales packets
<i>QA/QC Procedure</i>	Multiple A-Gas departments work in parallel during each process – Please refer to the detail description above.
<i>Notes</i>	N/A



## **E. QUANTIFICATION**

## E1. BASELINE

The baseline emissions are the emissions that would take place without the use of certified reclaimed HFCs. It is equal to the amount of HFC fire suppressants reclaimed and the subsequent sale, title transfer or return to fire suppression equipment during the reporting period. In the absence of the project, most of the refrigerant used to recharge the system would have come from virgin HFC production, and some would come from HFCs that would normally be reclaimed. The baseline calculation takes into consideration the 2% current HFC refrigerant reclamation rate.

The baseline emissions are calculated as follows:

$BE_{HFC, rp} = \sum_j [(VR_{HFC, j, rp} \times GWP_{HFC, j})] \times (1 - RR_{BL}) \div 1000$	
$BE_{HFC, rp}$	Baseline emissions during the reporting period (MT CO <sub>2</sub> e)
$VR_{HFC, j, rp}$	Total quantity of virgin HFC <i>j</i> used to recharge equipment during the reporting period (kgs), derived from the quantity of monitored certified reclaimed HFCs that is documented according to the procedures in Section 3.1 and Section 5
$GWP_{HFC, j}$	The global warming potential of HFC or HFC Blend <i>j</i> (see Table 3)
$RR_{BL}$	Baseline Virgin HFC Replacement Rate (% per year) <sup>15</sup>

A-Gas V9, baseline calculations:

2020 Reclaim HFC-125		2020 Reclaim HFC-227ea	
Parameter	Value	Parameter	Value
$BE_{HFC, rp}$	37,131 tonnes CO <sub>2</sub> e	$BE_{HFC, rp}$	117,209 tonnes CO <sub>2</sub> e
$VR_{HFC, j, rp}$	10,825 kgs	$VR_{HFC, j, rp}$	37,143 kgs
$GWP_{HFC, j}$	3,500	$GWP_{HFC, j}$	3,220
$RR_{BL}$	2.00%	$RR_{BL}$	2.00%

## E2. PROJECT SCENARIO

By using previously used, reclaimed HFC refrigerants, this project displaces new production of virgin HFC. Any project related emissions from using reclaimed refrigerant, for example, from transport of certified reclaimed HFCs, are considered negligible and outside the project boundary. Project emissions can be disregarded.

### E3. LEAKAGE

Projects involving certified reclaimed HFC refrigerant would not increase demand for refrigerant beyond current baseline demand, i.e., use of more reclaimed refrigerant would not cause an increase in virgin HFC production or increase refrigerant emission rates. For this project, leakage can be disregarded.

### E4. UNCERTAINTY

For the purposes of this methodology, it is assumed that from the time any reclaimed HFC refrigerant is sold or otherwise transferred from the reclaimer to a distributor, wholesaler, service technician, or an end-user that refrigerant will be used. There is no ex-post uncertainty accounted for in this methodology.

### E5. REDUCTIONS AND REMOVAL ENHANCEMENTS

Project emission reductions during reporting period equals baseline emissions of HFC fire suppressants during reporting period.

Parameter	Value
<b>BE<sub>HFCrp</sub></b>	154,340 tonnes CO <sub>2</sub> e
<b>ER<sub>rp</sub></b>	154,340 tonnes CO <sub>2</sub> e

### E6. EX-ANTE ESTIMATION METHODS

Emission reductions from project A-Gas V9 used the equations within the Methodology to calculate the GHG reductions achieved during the reporting period. There is one reporting period for this project from August 5, 2020 – December 30, 2020.

Project	Vintage	Total ERTs (tonnes CO <sub>2</sub> e) <sub>2</sub>
A-Gas V9	2020	154,340 tonnes CO <sub>2</sub> e



**F.**  
**COMMUNITY & ENVIRONMENTAL**  
**IMPACTS**



## F1. NET POSITIVE IMPACTS

Positive community impacts from the project include the reduction of emissions and economic benefit to refrigerant reclamation facilities. HFC refrigerants are the ozone friendly alternative to CFC and HCFC refrigerants, but HFC refrigerants are powerful greenhouse gases. As discussed, there is little incentive to reclaim and reuse HFC refrigerants because of the low costs associated with virgin production. Decreasing virgin production creates an emissions reduction. The purpose of this methodology is to transition the refrigerant industry from using virgin HFC refrigerants to using reclaimed HFC refrigerants.

There are no negative community or environmental impacts for this project. The Sustainable Development Goals set forth by the United Nations are met initially by the 9th goal to build resilient infrastructure, promote sustainable industrialization, and foster innovation through the recovery and reclamation of used HFCs that reduce reliance on virgin HFC production, eliminating the potential for release to the atmosphere. Goal 12, ensure sustainable consumption and production patterns, is also met as more HFC users are adopting sustainable infrastructure with the use of reclaimed HFCs, adding in the reduction of the future environmental costs of climate change. Additionally, Goal 13 (urgent action to combat climate change and its impacts) is met as recovery, reclamation, and reuse of HFCs results in fewer overall emissions of HFC and the associated climate change impacts that would result in the absence of the project.

## F2. STAKEHOLDER COMMENTS

Not applicable for A-Gas V9

## **G.**

# **OWNERSHIP AND TITLE**

## **G1. PROOF OF TITLE**

A-Gas retains title to all refrigerant and environmental attributes once purchased from the entity selling the material, or transferring to A-Gas for reclamation, destruction, and/or resale.

Additional evidence can be found on the A-Gas website: <https://www.agas.com/us/products-services/carbon-offsets/>

## **G2. CHAIN OF CUSTODY**

The offsets from this project have not been bought or sold previously. There is no forward option contract for the offsets from this project.

## **G3. PRIOR APPLICATION**

A-Gas has not applied for GHG emission reduction or removal credits for this project through any other GHG emissions trading system or program.

## **H.**

# **PROJECT TIMELINE**

## H1. START DATE

The reporting period start date for this project is August 5, 2020. The reporting period begins on the date that the initial volume of certified reclaimed HFC was sold to an A-Gas fire suppression customer.

## H2. PROJECT TIMELINE

- Initiation of project activities: August 5, 2020
- Project term: August 5, 2020 – December 30, 2020
- Crediting period: August 5, 2020 – August 4, 2060
- Frequency of monitoring, reporting, and verification: Once during reporting period.
- Domestic fire suppression companies sell their used HFCs to A-Gas. In turn, A-Gas reclaims the HFC back to ASTM industry specifications to be resold back into the market to reduce the need for virgin HFC fire suppressants.