Validation and Verification Report

ACR584 A-Gas V3

September 8, 2021

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1 INTRODUCTION

A-Gas contracted with Ruby Canyon Environmental, Inc. (RCE) to perform the validation and verification of the ACR 584 A-Gas V3 project (Project) for the reporting period August 6, 2019 through July 31, 2020 and a crediting period of August 6, 2019 to August 5, 2029 under the American Carbon Registry (ACR) program. This report is documentation of validation and verification activities that RCE performed for the Project located in Bowling Green, Ohio. For the validation, RCE reviewed the project information as described in the Project Plan "A-Gas V3" dated August 30, 2021. For the verification, RCE ensured that the GHG assertion was materially correct, that the data provided to RCE was well documented, and that if A-Gas made any material errors, that these errors were corrected.

1.1 OBJECTIVES

The objectives of the validation are to evaluate:

- Conformance to the ACR standard and the approved ACR Methodology for Certified Reclaimed HFC Refrigerants (Methodology);
- GHG emissions reduction project planning information and documentation in accordance with the applicable ACR-approved methodology, including the project description, baseline, eligibility criteria, monitoring and reporting procedures, and quality assurance/quality control (QA/QC) procedures;
- Reported GHG baseline, ex ante estimated project emissions and emissions reductions/removal enhancements, leakage assessment, and impermanence risk assessment and mitigation (if applicable).

The objectives of the verification are to evaluate:

- The emissions reductions and to ensure that the assertion is materially correct;
- The data provided to RCE can be documented and if errors or omissions are detected, they be corrected

RCE retains all data and documents for seven years after the end of the project reporting period or for the duration required by the GHG program, whichever is longer.

1.2 PROJECT BACKGROUND

The Project reclaims HFC, R-134a, from medical dose inhalers (MDIs) purchased from an MDI supplier and uses the reclaimed R-134a to charge or recharge refrigeration or air conditioning equipment to avoid the future production and use of virgin HFCs.

1.3 Responsible Party

Project Proponent

A-Gas
1100 Haskins Road
Bowling Green, OH 43402
Sandra Hoffman, Manager Environmental Services
419-867-8990
Sandy.hoffman@agas.com

1.4 Validation and Verification Team

Lead Validator and Verifier: Nina Pinette
Internal Reviewer: Michael Coté
Team Member: Garrett Heidrick

1.5 Validation and Verification Criteria

1.5.1 Validation and Verification Standards, Guidelines, and Tools

- A-Gas V3 Project Plan (August 30, 2021)
- A-Gas V3 Monitoring Report v3
- ACR Standard, Version 7.0 (December 2020)
- ACR Validation and Verification Standard Version 1.1 (May 2018)
- Certified Reclaimed HFC Refrigerants, Version 1.1 (September 2018) (Methodology)
- ISO 14064-3:2006 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions"

1.5.2 Level of Assurance

The verification was conducted to a reasonable level of assurance.

1.5.3 Materiality

The verification was conducted to ACR's required materiality threshold of +/-5% of the GHG project's emissions reductions or removal enhancements.

2 Validation and Verification Process

As the first step in validation/verification activities, the Lead Validator/Verifier developed a Validation/Verification Plan to be followed throughout the validation and verification. The plan included the following activities:

- RCE completed a COI form on January 29, 2021 to identify any potential conflict of interest with the Project or Project Developer. The COI form was approved by ACR on February 4, 2021.
- RCE and A-Gas held a validation/verification kick-off meeting on February 5, 2021. During the kick-off meeting RCE reviewed the validation/verification objectives and process, reviewed the schedule, and submitted an initial document request.
- RCE performed a strategic review and risk assessment of the received data and support documents to understand the scope and areas of potential risk in the GHG emissions reductions. In response to the COVID-19 pandemic, ACR approved RCE to conduct the site visit virtually. RCE assessed the risk of conducting a virtual site visit instead of an onsite visit as part of its risk assessment.
- RCE developed a risk-based sampling plan based upon the strategic review and risk assessment. The validation/verification plan and sampling plan were used throughout the process and were revised as needed based upon additional risk assessments.
- RCE conducted a virtual site visit to A-Gas' facility in Bowling Green, OH on March 11, 2021, using the real-time video web meeting and screen sharing platform Microsoft Teams. During the site visit RCE observed the HFC reclamation process and onsite GHG management systems and data gathering, monitoring, and handling practices and interviewed key personnel. The use of this method was effective in achieving the verification objectives.
  RCE met with the following personnel during the virtual site visit:
  - Sandy Hoffman – Manager of Environmental Services, A-Gas.
  - Michelle Gregg—Tower Operator, A-Gas
  - Amber Medina—Lab Technician, A-Gas
- RCE performed a risk-based desktop review of the submitted validation/verification documents. The desktop review included an assessment of the GHG calculation methods and inputs, source data completeness, GHG management and monitoring systems and eligibility documentation.
- RCE submitted requests for corrective actions, additional documentation, and clarifications as necessary to A-Gas throughout the validation/verification.
- RCE's internal peer reviewer conducted a review of the validation/verification sampling, report, and statement.
- RCE issued a final validation/verification report, verification statement, and List of Findings.
- RCE held an exit meeting with A-Gas.

3 VALIDATION AND VERIFICATION FINDINGS

3.1 PROJECT BOUNDARY AND ACTIVITIES

RCE reviewed the project boundary and activities and confirmed that both were appropriately identified and described in the Project Plan. The Project reclaims HFC R-134a from MDIs at A-Gas' Bowling Green, OH facility. A-Gas is a U.S. EPA-certified reclaimer.

MDIs are sent through A-Gas' Shredder process to extract and separate the medicine and R-134a from the MDIs and shred the plastic and metal contains to avoid any future use. The R-134a is then sent to A-Gas' Distillation Towers to be reclaimed to industry specifications to be sold to HVAC customers for use in

equipment operations and servicing/recharging to replace refrigerant that leaks or to charge newly manufactured refrigeration or air conditioning equipment. The finished product meets AHRI 700-2015 Standard for Specification for Fluorocarbon Refrigerants and is sold for use in HVAC and refrigeration equipment.

The Project's temporal boundary is the crediting period from August 6, 2019 to August 5, 2029.

3.2 GHG Sources Sinks, and Reservoirs

Table 1 shows the GHG emission sources included in the project boundary based on the Methodology. RCE confirmed that the Project Plan appropriately identifies the offset project boundary and includes all relevant SSRs.

Table 1. GHG Emissions Sources

Source	GHG	Description
Baseline	CO_2e	Emissions from the use of virgin HFCs in refrigeration or air conditioning equipment
Project Emissions	N/A	Per the Methodology, Project Emissions are not considered.
Leakage	N/A	Per the Methodology, Leakage is not considered.

3.3 Eligibility

3.3.1 ACR Eligibility

RCE confirmed the following ACR eligibility criteria listed in the ACR Standard, Version 7.0 by reviewing the project proponent's Project Plan, Monitoring Report, and calculations as well as other supporting documentation described throughout this report (a full list of documents reviewed is in Appendix A).

- Start Date: The project start date is August 6, 2019.
- Crediting Period: The crediting period is ten years as specified by the Methodology, August 6, 2019 – August 5, 2029.
- Minimum Project Term: Projects with no risk of reversal subsequent to crediting have no required minimum project term.
- Offset Title: RCE confirmed that the project proponent has undisputed title to all offsets. The project proponent purchases discarded MDIs containing R-134a from an MDI supplier, reclaims the R-134a, and sells it directly to end customers or through distributers. The reclaimed R-134a changes possession once it is sold or transferred to a distributor, wholesaler, service technician, or end-user. All HFC transactions are described by A-Gas' invoices. A-Gas retains all legal claims to the environmental attributes and GHG benefits of its processes and the avoidance of the production of virgin HFC refrigerants. and A-Gas also owns the facility where the R-134a is reclaimed.
- Additional: RCE confirmed that the project is additional as described in Section 3.4.

- Permanent: In the absence of the project, virgin R-134a would have been produced and used in HVAC or refrigeration equipment. The project will generate emissions reductions that are permanent and have no risk of reversal.
- Net of Leakage: The Methodology specifies that leakage does not need to be considered as it is unlikely that any emissions would occur outside the project boundary.
- Independently Validated and Verified: RCE is a third-party validation and verification body that the project proponent has contracted to validate the project.
- Community & Environmental Impacts: RCE reviewed project impacts as described in section 3.6 of this report.

3.3.2 Methodology Eligibility

RCE reviewed the Project against the ACR Methodology eligibility requirements and confirmed the following:

- The Project occurs in the United States. The reclamation facility is located at 1100 Haskins Rd. Bowling Green, OH 43402 with GPS coordinates 41.3755, -83.6504.
- The Project is within a sector and segment which has a low adoption rate for the relevant project activity.
- The refrigerant meets the definition of a certified reclaimed HFC refrigerant, which is an "HFC that has been reclaimed by an EPA-certified reclaimer to meet the AHRI 700-2015 Standard for Specifications for Fluorocarbon Refrigerants by an EPA certified reclaimer and tested by an AHRI certified refrigerant testing laboratory to meet the AHRI Standard."

3.4 ADDITIONALITY

The Project meets the requirements for the demonstration of additionality specified by the ACR Standard by exceeding the approved performance standard defined in the Methodology and demonstrating surplus to regulations.

3.4.1 Regulatory Additionality Test

No existing laws or regulations mandate the Project activity or reclamation of HFCs. During 2019 and 2020, there were no requirements to reclaim HFCs. A-Gas is an EPA-certified reclaimer of HFCs. The EPA does not require certified reclaimers to reclaim used HFCs. Additionally, RCE reviewed federal and state requirements for facilities who manage used HFCs and found no evidence that HFCs are required to be reclaimed, therefore, the project passes the regulatory additionality test.

At the time of validation and verification, the American Innovation in Manufacturing Act (AIM) enacted in December 2020, which directs the U.S. EPA to address the environmental impact of HFCs by phasing down phasing down production and consumption, maximizing reclamation and minimizing releases from equipment, and facilitating the transition to next-generation technologies through sector-based restrictions, does not affect the Project because the rulemaking process directed by the act is still underway. ACR considers ERTs issued by the Project to be additional.

3.4.2 Practiced-Based Performance Standard Test

Per the Methodology, all relevant sectors and segments (Table 1 of Methodology) have a low market adoption rate for using certified reclaimed HFCs. Moreover, current industry information indicates that there are very small quantities of HFCs from MDIs that are being recovered in the United States. Therefore, the project passes the performance standard test.

3.5 PERMANENCE

The emissions reductions from the use of certified reclaimed HFC refrigerants can be deemed as permanent because they displace the production and use of virgin HFCs.

3.6 ENVIRONMENTAL AND COMMUNITY IMPACTS

The project plan includes a comprehensive summary of the project activity's net positive environmental impacts. Reclaiming HFCs avoids the production and use of virgin HFCs and their eventual leakage from HVAC or refrigerant equipment into the atmosphere. There are no negative community or environmental impacts for this project. A-Gas holds all required environmental permits to construct and operate the reclaimed HFC facility. The Project Plan also identifies contributions as aligned with relevant sustainable development goals (SDGs) including Industry, Innovation, and Infrastructure; Responsible Consumption and Production; and Climate Action.

The validation team confirmed that the project activity is not expected to promote significant negative environmental impacts.

3.7 LOCAL STAKEHOLDER CONSULTATION

Not applicable for this Project. The Methodology does not require public consultation from stakeholders.

3.8 BASELINE SCENARIO

The baseline determines the emissions that would occur in the absence of the project. The project activity is the use of reclaimed HFC refrigerants to displace the use of virgin HFC refrigerants. GHG emissions are avoided because in the baseline scenario, the virgin HFC refrigerants would have been used to charge or recharge refrigeration or air conditioning equipment causing CO_2e emissions to be released. Instead, the reclaimed HFC refrigerants are being extracted, cleaned to virgin quality, and re-used, thus avoiding those emissions. The Methodology establishes the baseline scenario as the continued use of virgin HFC refrigerants. RCE confirmed that the Project Plan appropriately identifies the baseline scenario.

3.9 DATA MANAGEMENT SYSTEM AND MONITORING PLAN

RCE reviewed A-Gas' processes for data collection and management and determined that they were sufficient to meet all ACR and Methodology requirements. The validation/verification team gained an understanding of the controls put in place to account for the HFC received, reclaimed, and sold in the Project through interviews with key personnel, the virtual site visit to A-Gas' reclamation facility, and the

review of all documentation provided by A-Gas. A-Gas monitors the amount of R-134a that is reclaimed and sold back into the market. A-Gas' scales are calibrated quarterly. This activity is completed by Brechbuhler Scales, Inc and Antibus Scales & Systems. The reclaimed R-134a is analyzed by A-Gas' AHRI 700-certified laboratory to ensure it meets all purity requirements.

A-Gas' Project Plan includes a Monitoring Plan that identifies all monitored data and parameters. RCE confirmed that the monitoring parameters and approaches conform to the methods required by the Methodology. The plan includes all relevant data parameters and appropriately identifies units of measurements, data sources, methodologies, uncertainty, monitoring frequency and procedures, and QA/QC procedures. After discussions with A-Gas and reviews of project documents, RCE determined that the Monitoring Plan accurately reflects how Project data is monitored and recorded and there are no deviations relevant to the Project activity against the requirements of the Methodology. A-Gas implemented the monitoring plan as stated in the Project Plan during Project activities.

3.10 Project Data and GHG Emissions Reduction Assertion

RCE reviewed the Project Plan and Project data and calculations to ensure that appropriate equations were used in calculating baseline emissions, project emissions, and emissions reductions.

3.10.1 Baseline Emissions

Baseline emissions include the emissions that would occur without the use of certified reclaimed HFCs. They are equal to the total amount of reclaimed HFC refrigerant produced and the subsequent sale, title transfer or return to a refrigerant distributor, refrigerant wholesaler, or an end-user for use in refrigeration or air conditioning 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 the HFCs that would normally be reclaimed.

Baseline emissions are calculated by multiplying the amount of reclaimed HFC used to (re)charge equipment by a specified 10-year loss rate of displaced virgin HFC. Total weight of displaced HFC is then multiplied by the specified Global Warming Potential of the displaced virgin HFC.

3.10.2 Project Emissions

Per the Methodology, any project related emissions from the use of reclaimed refrigerant, for example, from transport of certified reclaimed HFCs, are considered negligible and outside the project boundary. Thus, project activity emissions are zero.

3.10.3 Emissions Reductions

RCE verified that A-Gas calculated emissions reductions according to relevant Methodology equations and that the methods are included in the Project Plan.

RCE calculated emissions reductions for the reporting period according to the equations defined in the Methodology and the Project Plan and found the assertion to be free of material misstatement. RCE's calculated ERTs are shown in Table 2.

Table 2. RCE-calculated ERTs

Reporting Period	RCE ERTs ($MTCO_2e$)	A-Gas ERTs ($MTCO_2e$)
August 6, 2019 – July 31, 2020	16,515	16,515

4 VALIDATION AND VERIFICATION RESULTS

RCE developed one List of Findings for both the validation and verification notifying A-Gas of corrective action requests (CARs) and clarification requests (CRs). A-Gas appropriately responded to all items in the List of Findings. The List of Findings is provided as Appendix B.

5 VALIDATION AND VERIFICATION CONCLUSION

RCE conducted a risk-based validation and verification of the A-Gas V3 project that included a strategic review of the project data, documentation, and emission reduction calculations. The objective of the validation activities was to assess the project design, baseline scenario, and monitoring plan and to ensure compliance of the Project Plan to the assessment criteria defined in Section 1.5.1. The objective of the verification activities was to conduct an independent assessment of the project reporting period and ex-post GHG emission reductions resulting from the Project.

Based on the review and the historical evidence collected, RCE concludes to a reasonable level of assurance that the GHG assertion is free of material misstatement. The emission reductions resulting from HFC reclamation for the reporting period August 6, 2019 to July 31, 2020 can be considered in conformance with the:

- ACR Standard, Version 7.0 (December 2020)
- ACR Validation and Verification Standard Version 1.1 (May 2018)
- Certified Reclaimed HFC Refrigerants, Version 1.1 (September 2018)
- ISO 14064-3:2006 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions"

Table 3 provides a summary of the emissions reductions.

Table 3. A-Gas V3 Emissions Reductions

Vintage	Baseline Emissions ($MTCO_2e$)	Project Emissions ($MTCO_2e$)	Emissions Reductions ($MTCO_2e$)
2019	2,954	0	2,954
2020	13,561	0	13,561
TOTAL	**16,515**	**0**	**16,515**

Lead Validator and Verifier

Nina Pinette

Internal Reviewer

Michael Coté

6 APPENDIX A—DOCUMENTS REVIEWED

1. Scale Calibrations
2. 2020 EPA equipment list
3. A-Gas regulatory compliance attestation
4. A-Gas V3 Project Plan
5. A-Gas V3 Monitoring Report
6. A-Gas V3 Listing Form
7. Sales documentation
8. Purchase documentation
9. AHRI 700 tests for all HFCs sold
10. MDI process overview

7 APPENDIX B—LIST OF FINDINGS

Corrective Action Request (CAR), Additional Documentation Request (ADR), or Clarification Request (CR) #	Finding	Section of Standard or Methodology	Material Misstatement (MM) or Non-Conformance (NC)	Project Proponent Response	RCE response	Additional OPO/APD response	Additional RCE response
CAR 1	All refrigerants' 'Total Weight' (column E) in the "A-Gas V3 HFC Calc Summary" spreadsheet "A-Gas V3 Origin Summary" tab are multiplied by a constant of 0.286 to get total R134a weight (column F). This constant works for all refrigerants except for PO 8073 and 8719 resulting in a 5.05% difference in total weight.	Methodology Section 5	MM	Updated the 134a values based on the values within the packet as the formula was not used to accurately reflect the value. These numbers were input without a formula	Corrected. Closed: 8/30/21.		
CAR 2	Please address the following in the Project Plan: -B1. The most recent ACR Standard is version 7.0. -B2. Table 3 references the sectors that you are selling refrigerant to, not buying it from.	Project Plan Instructions; Methodology Table 1	NC	Updated and uploaded to Dropbox	Corrected. Closed: 8/30/21.		
CAR 3	Update the Monitoring Report to use the most recent version of the Monitoring Report template (v3).	Monitoring Report Instructions	NC	A-Gas provided the updated Monitoring Report.	Corrected. Closed 9/7/21.		
CR 1	Please address the following regarding the sale of HFC: -Invoice #71586 to Daikin shows 4 1,000 lb tanks being sold. However, only 1,000 is included in the project. Are the other 3 tanks filled with gas not from this project? -Invoice #83628 to Ingersoll shows 120 30 lb cylinders being sold. However, only 1200 lbs is included in the project. Is the other 2400 lbs filled with gas not from this project?	Methodology Section 5.2	NC	Adjusted the summary sheet and sorted sales packets as followed: Updated #71586 to 4000#, #83628 to 3600#. Removed #71664 CAPP, #90309 Controlled Temp, and #90309 Johnstone TX. This was done so the amount of MDI supplied product to reclaim exceeds the amount of reclaimed material sold.	RCE reviewed new calc tool, origin summary, and sales. Please confirm weights removed from sales. RCE shows that CAPP USA, Ferguson Enterprise, and Garden City Wholesale were removed. Removing these three sales provides the same weight reductions as what A-Gas listed.	Yes, these are the sales packets that were removed.	Closed: 8/31/21
CR 2	Please confirm that the scales used for V3 are the same scales used for V2. If they are not the same, please provide a list of scales used for V3.	Methodology Section 5.2	Potential NC	All the same scales from V2 were used.	RCE has documentation for scales on file. Closed: 8/30/21.		