TRADEWATER INTERNATIONAL DOMINICAN REPUBLIC

Document Prepared by Tradewater International, SRL

Project Title	Tradewater International Dominican Republic
Version	1.0
Date of Issue	25-05-2021
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1 PROJECT DETAILS

1.1 Summary Description of the Project

The Tradewater International Dominican Republic Project ("Project") collects and/or acquires recovered and stockpiled ozone depleting substances (ODS) in the Dominican Republic and transports them to the United States or potentially elsewhere in subsequent monitoring events for destruction at a facility that meets the Montreal Protocol's TEAP requirements. The Project is conducted under VM0016 and will utilize the VMD0048 Module, Version 1.0 and the CDM *Tool for the demonstration and assessment of additionality*, Version 7.0.

The Project provides important emissions reductions. ODS were used as refrigerants, and while their production was banned by the Montreal Protocol, they are still in use and broadly distributed in consumer quantities throughout the world. ODS are potent greenhouse gases with a global warming potential of up to 10,900 times that of carbon dioxide. Dominican Republic has no mandate to destroy ODS and no domestic destruction facilities capable of destroying ODS in compliance with rules and regulations, and the Montreal Protocol requirements. Thus, before the Project, there were no means to destroy ODS material in the country. Without the Project, these gases would otherwise be released into the atmosphere contributing to climate change.

It is estimated that the Project will result in no less than 20,000 metric tons of emissions reductions and as much as 40,000 metric tons across multiple destruction events (project instances) over the ten-year project period.

1.2 Sectoral Scope and Project Type

The Project falls under Sectoral Scope 11 *Fugitive emissions – from Industrial gases (halocarbons and sulphur hexafluoride)* and should be considered a grouped project. Each shipment of ODS from the Dominican Republic to the United States or elsewhere will be destroyed in a discrete event and verified separately.

1.3 Project Eligibility

Per VCS Standard v4.1, the Project satisfies the VCS program eligibility requirements described in Section 3 *Project Requirements*.

The Project satisfies the general requirements described in Subsection 3.1 *General Requirements*, particularly:

- The Project meets all applicable rules and requirements set out under the VCS Program. The Project is guided by the principles set out in Section 2.2.1.
- The Project applies in full the methodology *VM0016 Recovery and Destruction of Ozone Depleting Substances (ODS)*, v1.1, eligible under the VCS Program.

- The Project and the implementation of project activities do not lead to the violation of any applicable law, regardless of whether or not the law is enforced.

Furthermore, the Project satisfies the requirements described in Subsection 3.3 *ODS-Specific Matters*, particularly:

Eligible ODS

- The ODS types from the Project are listed in Annex A Group I, Annex B Group I, and Annex C Group I, and as a result, are eligible.
- The ODS material destroyed in the Project is unused and recovered from refrigeration, air conditioning, and/or fire suppression equipment, systems, or appliances; and/or thermal insulation foams; and as a result, are eligible.

ODS Origin

- The ODS material has not been recovered from products that have been imported specifically for their disassembly.
- Documentary evidence is provided to verify the origin of all ODS destroyed by the Project.

Destruction Technology

- The Project uses a destruction technology that meets the screening criteria for destruction technologies set out in the *UNEP April 2002 Report of the Technology and Economic Assessment Panel (TEAP), Volume 3b, Report of the Task Force on Destruction Technologies*.
- The Project uses a destruction technology with a minimum verified DRE of 99.99 percent.

1.4 Project Design

The Project has been designed as a grouped project.

Eligibility Criteria

The Project is designed to bring multiple shipments of ODS from Dominican Republic to the United States or elsewhere for destruction. Each shipment will be separately destroyed, and each destruction event will be considered a new instance of the project activity, subject to verification and credit issuance. The project boundaries will remain the same for each instance. Determination of baseline scenario and demonstration of additionality are based upon the initial project activity instance, in compliance with article 3.5.9 of the VCS Standard.

1.5 Project Proponent

Organization name	Tradewater International, SRL
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Title	Director
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1.6 Other Entities Involved in the Project

Organization name	Servicios Contra Incendios Marítimo E.I.R.L.
Role in the project	Partner in the collection and aggregation of ODS in the Dominican Republic
Contact person	Jonathan Almanzar
Title	General Manager
Address	Street Eusebio Manzueta #32, Maria Auxiliadora, National District 10306, Santo Domingo, Dominican Republic
Telephone	+1 829-341-5135 / +1 809-688-8244
Email	secimar@gmail.com

1.7 Ownership

All the material will be collected and/or acquired from Servicios Contra Incendios & Marítimos (SECIMAR, SRL) or any other local waste manager who will source the unused and recovered ODS material from various origins in the Dominican Republic. Tradewater International will acquire and obtain title to all ODS collected and aggregated, and its environmental attributes, through a contract with the local waste manager(s). Title will include the right to any removal, limitation, reduction, avoidance, sequestration or mitigation of any greenhouse gas arising from or relating to the destruction of the ODS. See Appendix A, Transfer of Ownership Agreement as an example from the first project instance.

1.8 Project Start Date

The Project start date is February 19, 2021, the date Tradewater International first destroyed ODS collected from Dominican Republic and began generating GHG reductions. Per VCS Standard v4.1, the Project satisfies the VCS program start date requirements described in Section 3.7 *Project Start Date*. There is no production phase-out deadline which applies to the Dominican Republic, as this country has not been and is not a producer of ODS. The Project start date (February 2021) is after the date the country implements the consumption phase-out. The Dominican Republic implemented the CFC phase out as of 1990 and implements the HCFC phase out as of 2013. HCFC phase-out was combined with a ban on imports of HCFC-based refrigeration and air-conditioning equipment, enforced since 2017.

1.9 Project Crediting Period

The Project crediting period is from February 19, 2021 through February 18, 2031, for a total of ten years. Tradewater International will seek immediate crediting for any individual destruction event.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 2021	20,000
Year 2022	0
Year 2023	20,000
Year 2024	0
Year 2025	0
Year 2026	0
Year 2027	0
Year 2028	0
Year 2029	0

Year 2030	0
Total estimated ERs	40,000
Total number of crediting years	10
Average annual ERs	4,000

1.11 Description of the Project Activity

The Project involves the identification, collection and aggregation of unused and recovered ODS material in the Dominican Republic. The ODS material will originate from stockpiled consumer quantities of ODS, as well as from refrigerants which have been recovered by private companies, technicians and/or directly by the waste managers, and which may have been stockpiled over the years. Tradewater International will acquire the ODS material from Servicios Contra Incendios & Marítimos (SECIMAR, SRL) or another authorized local waste manager to carry out these processes in the Dominican Republic.

Since the Dominican Republic lacks local destruction capacity, Tradewater International will transport the consolidated ODS from Dominican Republic to the United States or elsewhere for destruction, to prevent these gases from being released into the atmosphere. Tradewater International will have the ODS destroyed at a facility that complies with the Montreal Protocol requirements for the destruction of ODS, including the Heritage Thermal Services facility in East Liverpool, Ohio.

1.12 Project Location

The project location will be the Dominican Republic, in that all ODS material will be collected and/or acquired in the Dominican Republic. Servicios Contra Incendios & Marítimos (SECIMAR, SRL) or any other authorized local waste manager will be the source of consolidation activities. The GPS coordinates for SECIMAR are:

Latitude: 18.49142
Longitude: -69.88860

The destruction of the ODS will occur in the United States, or in another country with destruction capacity that demonstrate compliance with laws and regulations and the Montreal Protocol. Tradewater International will endeavor to transport all ODS directly from the Dominican Republic to the country of destruction, but it is possible that the material will travel by ship through other ports of call along the way.

1.13 Conditions Prior to Project Initiation

In the Dominican Republic, ODS material has been stockpiled over the years through programs that recovered material from private companies and technicians, and that collected unused material from distributors that was originally imported for sale. In the country however, there is currently no law, rule or regulation requiring the destruction of ODS, and no equipment or technology capable of destroying ODS consistent with the requirements of the Montreal Protocol. As a result, the ODS material in the Dominican Republic is released into the atmosphere - either quickly, because it is not captured from equipment at end of life, or slowly, because it is captured and placed into stockpiles, or simply remains in stockpiles with no future use. Further details are provided in Section 3.4 *Baseline Scenario* of this document.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

Dominican Republic

First, the Dominican Republic has no law, statute or other regulatory framework mandating the destruction of ODS. Resolution No.0031/2018, Article 27, attached as Appendix B, clarifies that any substance controlled by the Montreal Protocol will be recovered for its reuse or disposal. Furthermore, an email from the National Coordinator of the Ozone Layer Protection Program (PRONAOZ) at the Ministry of Environment and Natural Resources

(MARENA) of the Dominican Republic, made available during verification, confirms that in the country, regulations allow the destruction, sale, recovery, reuse, and conversion of ODS material according to the technologies approved by the Montreal Protocol. In summary, current regulations in the Dominican Republic do not mandate the destruction of ODS material in the country, as other options for the management of ODS are suggested and allowed besides just final disposal.

Second, in the Dominican Republic, ODS refrigerant gases are not considered a hazardous waste. See Appendix C, Confirmation of material not falling into the category of hazardous waste. The Dominican Republic regulates the export of ODS from the country under Resolution No.0031/2018, Article 55. Permission to export can be, and for the Project will be, obtained by request using the application in Resolution No.0031/2018.

Third, in the Dominican Republic, Article 29 in the Resolution No.0031/2018 establishes that the activities of reclaiming, recycling and regeneration of substances controlled by the Montreal Protocol are to be performed by physical or legal figures authorized to do so by the MARENA. The activities which a legal figure is authorized to carry out can be seen in SECIMAR Environmental Authorization, Appendix D.

United States

United States law permits the import of ODS for the purpose of destruction through an application process administered by the United States Environmental Protection Agency, Stratospheric Protection Division. All ODS included in the Project will be imported with permission of the US EPA and reporting on the amounts and types of ODS imported into the United States for destruction will be made under 40 CFR 82.13(g)(4) and 40 CFR 82.24(c)(1).

Once in the United States, the ODS is handled according to certain Environmental Protection Agency and Department of Transportation Rules. These are the same rules applicable to the handling of domestic-sourced ODS, with which Tradewater International is intimately familiar. Tradewater International S.R.L. is owned by Tradewater L.L.C., an EPA-Certified reclamation facility, whose employees hold EPA 608 or 609 certifications.

Once in Heritage Thermal Services, the destruction facility in East Liverpool Ohio, the ODS is destroyed in compliance with all the applicable laws and regulations. This includes environmental regulations administered and enforced by the Environmental Protection Agency, as well as health and safety regulations administered and enforced by the U.S. Department of Labor.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The Project has not been registered and is not seeking registration under any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

The Project has not been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The GHG emission reductions from the Project activities are not included in any other emissions trading program or mechanism that includes GHG allowance trading, and will not and cannot be used for any existing compliance program. There is no such regime in the Dominican Republic, and the only other compliance program that Tradewater LLC, owner of Tradewater International, currently participates in is the regulated Cap and Trade program in California, which does not consider ODS sourced from outside the United States to be eligible. Tradewater International will not seek crediting through any other program.

1.16.2 Other Forms of Environmental Credit

The Project has not sought or received any other form of GHG-related environmental credit, including renewable energy certificates. The Project is not eligible to participate in any other such program.

1.17 Additional Information Relevant to the Project

Leakage Management

The Project is designed to prevent leakage in the best way possible – by collaborating with local waste managers who properly capture and recover ODS material from equipment, systems or appliances; and by acquiring ODS material from stockpiles that they hold, which would otherwise slowly be released into the atmosphere as explained in section 1.13. Beyond our project, there are no destruction facilities and there is little to no reclamation or recycling centers in the Dominican Republic. In general, the Dominican Republic does not have a well-established infrastructure for the recovery and reclamation, and therefore reuse, of ODS.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Sustainable Development

The Project supports United Nations sustainable development goals (SDG) 1 (No Poverty), 12, (Responsible Consumption and Production), and 13 (Climate Action).

- SDG1: The Project contributes to grass roots economic development in the Dominican Republic. Tradewater International's aggregation approach to identifying and collecting ODS fosters and implies participation of various stakeholders. The volume of ODS comes from consumer quantity cylinders in addition to material recovered from equipment from companies and individual technicians. Tradewater International finances local partners to handle the ODS material that they have identified and collected, as well as partners who transport the ODS material within the Dominican Republic, creating job opportunities at the local level.
- SDG 12: The Project supports the collection and destruction of one of the most powerful greenhouse gases in the world; paving the way to the development and use of safer and more environmentally friendly alternatives.
- SDG 13: The phase-out to date of most ODS has not only led to the regeneration of the ozone layer but also to significant reductions in greenhouse gas emissions (GHG), as most ODS are also powerful GHGs. Tradewater International has the objective to prevent the release of ODS gases into the atmosphere. By identifying, collecting, managing, and destroying refrigerant gases in an appropriate manner, Tradewater International aims to prevent ozone depletion, negative environmental impacts, and climate change.

Further Information

None available.

2 SAFEGUARDS

2.1 No Net Harm

Tradewater International is unaware of any potential negative environmental or socio-economic impacts from this Project. The Dominican Republic is part of the Montreal protocol since 1993 and has been eliminating substances that affect the ozone layer in recent years. In 2010 the country finished eliminating CFCs, in 2012 HCFC consumption freeze was achieved, and in 2013 the 10% reduction in base consumption began. It is currently moving forward for the complete elimination of these substances by 2025. Since

there is currently no infrastructure necessary to responsibly manage and destroy ODS in the country, Tradewater International Project activities bring a solution to this problematic.

Tradewater International has participated in several meetings and discussions with government officials, as well as reviewed documents, which reveal no negative impacts from projects of this type. SECIMAR and other local waste managers will be licensed and authorized to recover, regenerate and recycle refrigerant gases by the Ministry of Environment and Natural Resources of the Dominican Republic. SECIMAR Environmental Authorization is attached as Appendix D.

2.2 Local Stakeholder Consultation

Tradewater International engaged initially with the National Coordinator of the Ozone Layer Protection Program, to understand the country's needs and context regarding the rules and regulations in place for the disposal of ODS refrigerants. Further, this engagement was continuous to ensure that the Project complied with applicable local laws around the handling of ODS, and to ensure that exports of ODS from Dominican Republic complied with applicable laws as well.

Tradewater International also collaborated with SECIMAR SRL as a local waste manager authorized for the handling of ODS refrigerant gases. SECIMAR has been authorized by MARENA to conduct activities related to the handling of ODS refrigerant gases.

Both partnerships will be ongoing throughout the Project period. At least prior to each monitoring event, Tradewater International will consult directly with the Ozone Layer Protection Program, to ensure that exports of ODS from the Dominican Republic have the support of, and comply with, applicable laws, as well as explore collaboration opportunities with national initiatives. In addition, Tradewater International will further engage with other stakeholders, such as associations and chambers from various sectors. Informative material about the Project has been and will continue to be distributed to the local stakeholders.

2.3 Environmental Impact

Not applicable as no environmental impact assessments were carried out with respect to the project.

2.4 Public Comments

No public comments were received.

2.5 AFOLU-Specific Safeguards

The Project is a non-AFOLU project, thus, this section is not applicable.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The Project will seek crediting under VM0016 *Recovery and Destruction of Ozone-Depleting Substances*, Version 1.1, 30 November 2017, utilizing VMD0048 *Activity Method for the Determination of Additionality for Recovered and Stockpiled ODS Refrigerant Projects*, Version 1.0, 30 November 2017; and the CDM *Tool for the demonstration and assessment of additionality*, Version 7.0.

3.2 Applicability of Methodology

The Project satisfies all applicability conditions of VM0016 and VMD0048.

VM0016:

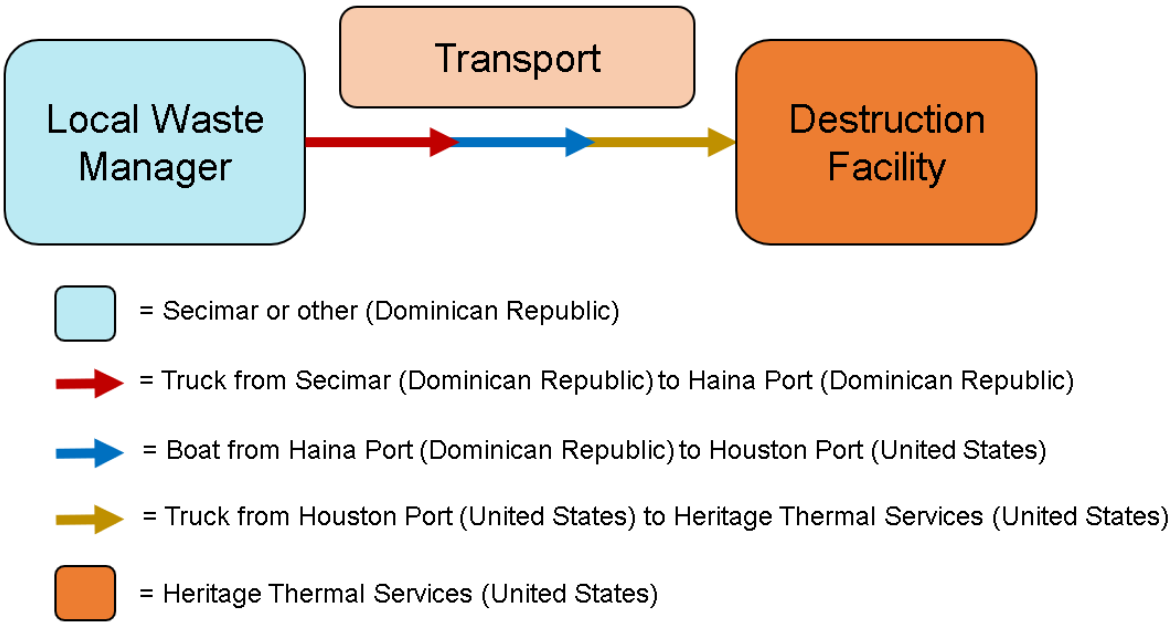
- The Project will only source ODS from existing stockpiles and recovered from equipment, systems or appliances, where the baseline scenario is the atmospheric release of ODS as explained in section 1.13. It will not include ODS refrigerants manufactured for the sole purpose of their subsequent destruction. Tradewater International will demonstrate compliance with written documentation identifying the source of all included ODS.
- The Project will take place in an Article 5 country (Dominican Republic, collection and aggregation) and a Non-Article 5 country (United States, destruction).
- The Project will only include ODS refrigerants listed in Appendix I of the methodology. This will be demonstrated through laboratory samples of all ODS destroyed.
- The Project will collect, store and transport all ODS in cylinders or other hermetically sealed containers.

VMD0048:

- The Project will collect and destroy recovered CFC refrigerant and/or consumer quantity CFC refrigerant.
- The Project will include CFC refrigerant collected in the Dominican Republic, which does not have any schemes or programs that create incentives or mechanisms that result in the destruction of ODS refrigerants as an industry common practice.

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Emissions through the release of ODS refrigerants into the atmosphere	CO_2	No	
		CH_4	No	
		N_2O	No	
		ODS	Yes	Main emission source in the baseline
Project	Emissions through on-site fossil fuel and electricity consumption at the recovery facility	CO_2	Yes	This will be a minor source of emissions but will be calculated
		CH_4	No	Excluded by the methodology
		N_2O	No	Excluded by the methodology
		Other	No	N/A
	Emissions through transportation of ODS from the recovery facility to the destruction facility	CO_2	Yes	This will be a minor source of emissions but will be calculated
		CH_4	No	Excluded by the methodology
		N_2O	No	Excluded by the methodology
		Other	No	N/A
Project	Emissions associated to the destruction process of ODS	CO_2	Yes	This will be a source of emissions and will be calculated
		CH_4	No	Excluded by the methodology
		N_2O	No	Excluded by the methodology
		ODS	Yes	This will be a minor source of emissions but will be calculated



Project Boundary diagram.

3.4 Baseline Scenario

The Baseline Scenario for this project is a version of R4. In the absence of the Project, ODS in the Dominican Republic will be released into the atmosphere, as explained in Section 1.13.

The Dominican Republic has no law, statute or other regulatory framework mandating the destruction of ODS and it remains lawful to recover, reuse, convert, and sell ODS in the Dominican Republic according to the technologies approved by the Montreal Protocol. These facts are confirmed in Resolution No.0031/2018, Article 27, attached as Appendix B, and are supported by an email from the National Coordinator of the Ozone Layer Protection Program at the Ministry of Environment and Natural Resources of the Dominican Republic, made available during verification.

In 2017, the Dominican Republic carried out an initiative called ODS Bank Inventory in Dominican Republic, which sought to establish a political framework to set up a national ODS bank management system. The first step of this initiative was to define the amount of ODS potentially available in the country for ODS bank management. The official results from this study have not been published yet. A program to encourage capture was established and implemented by SECIMAR, a local waste manager, but no pathway to destruction was ever opened and the Dominican Republic remains without any destruction

capacity. The absence of any destruction capacity in the Dominican Republic means that neither R1, R2 nor R3 are credible alternatives to the Project.

Similarly, the experience of SECIMAR makes clear that there is no market for the sale of their stockpiled ODS or ODS recovered from equipment. SECIMAR worked as a Project Partner of Tradewater International because they were responsibly capturing ODS from equipment and had stockpiled material resulting from a national program, but had no market into which they could sell the material and no equipment to reclaim or reuse the ODS. All the ODS sat in cylinders with no alternative use.

The result is that the baseline for ODS in the Dominican Republic is release into the atmosphere – either quickly, because it is not captured from equipment at end of life, or slowly, because it is captured and placed into stockpiles or simply remains in existing stockpiles with no future use.

3.5 Additionality

Additionality for the Project falls under VM0016, Section 7.1 for the CFCs and 7.2 for the HCFCs.

With regards to the CFC material from the Project, Section 7.1:

Step 1: Regulatory surplus exists because the Dominican Republic has no rules or regulations mandating the destruction of ODS. This is confirmed in an email from the National Coordinator of the Ozone Layer Protection Program at the Ministry of Environment and Natural Resources of the Dominican Republic.

Step 2: The Project is in conformance with the positive list, as it meets the applicability conditions described in Applicability of Methodology section above, set forth in VMD0048, Version 1.0, Section 4, and is therefore considered additional:

- The Project will consist of the collection and destruction of recovered CFC refrigerant and/or the collection and destruction of CFC refrigerant that meets the definition of consumer quantity CFC. The evidence to substantiate these assertions includes a transfer of ownership agreement identifying the owner of the refrigerant and a list of the containers of ODS refrigerant acquired, including the container ID, container capacity, refrigerant type, and net refrigerant weight. See Appendix A as an example from the first project instance.
- Tradewater International has participated in several meetings and discussions with government officials, as well as reviewed documents, to confirm that there are no current schemes or programs in the Dominican Republic designed to incentivize ODS refrigerant destruction.

With regards to the HCFC material from the Project, Section 7.2, which are considered to be other ODS refrigerant types:

The Project is considered to be additional according to the approach described in the CDM *Tool for the demonstration and assessment of additionality*, Version 7.0, Section 4, Step 0: *First-of-its-kind project activities*. No HCFC destruction project has been previously carried out in the Dominican Republic, due to the absence of ODS destruction infrastructure and technology in the country compliant with the Montreal Protocol requirements, as well as the lack of financial mechanisms to make this feasible. This Project is bringing a solution to this problematic, as these barriers are consistent throughout all activity instances. Tradewater International Dominican Republic Project would be the first Project to be listed under the Verified Carbon Standard for the collection and destruction of HCFCs in the Dominican Republic. Thus, this Project is the first-of-its kind, and as a result, is considered additional.

3.6 Methodology Deviations

Section 9.3, Description of the Monitoring Plan, of the VM0016 Methodology for the Recovery and Destruction of Ozone Depleting Substances requires moisture content of each sample to be "less than 75% of the saturation point for the ODS based on the temperature recorded at the time the sample was taken". For containers that hold mixed ODS, the methodology makes a conservative assumption also under section 9.3: "the saturation point shall be assumed to be that of the ODS species in the mixture with the lowest saturation point that is at least 10 percent of the mixture by mass". However, that assumption may be overly conservative in certain cases.

In monitoring events for which sample results indicate a higher moisture saturation than the 75% maximum requested by the protocol under the conservative calculation method indicated for mixed ODS, Tradewater International proposes a methodology deviation. This deviation is in compliance with article 3.17.1 of the VCS Standard v4.1, as it relates only to the criteria and procedures for monitoring of the methodology; specifically to the composition analysis requirements outlined in Section 9.3. See Appendix E, Methodology Deviation, to review the deviation details, justification and proposal for the first project instance.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions will be quantified using the method described in Section 8.1 of VM0016. Below are the equations used with explanation and justification of methodological choices including the selection of emission factors and default values.

$$BE_{ODS,y} = BE_{ODS\_ref,y} + BE_{ODS\_foam,y} \quad (1)$$

Where:

$BE_{ODS,y}$	=	Total quantity of baseline emissions from ODS refrigerants and blowing agents (foam) which would be released into the atmosphere in the absence of the project activity in year y [tCO2e]
$BE_{ODS\_ref,y}$	=	Baseline emissions from ODS refrigerants which would be released into the atmosphere in the absence of the project activity in year y [tCO2e]
$BE_{ODS\_foam,y}$	=	Baseline emissions from ODS blowing agents contained in insulation foams of refrigeration appliances which would be released into the atmosphere in the absence of the project activity in year y [tCO2e]. Since this project does not involve the recovery and destruction of ODS blowing agents contained in insulation foams, these emissions are assumed to be zero.

Baseline emissions from ODS refrigerants are determined as follows:

$$BE_{ODS\_ref,y} = \sum^{n} ((M_{DESTR,refr,i,y} \times VR_{refr} \times EF_{VR}) + (M_{DESTR,refr,i,y} \times RR_{refr,i,y} \times EF_{RR,refr,i,y}) + (M_{DESTR,refr,i,y} \times DR_{refr} \times EF_{DR})) \times GWP_{refr,i} \quad (2)$$

$$1 = VR_{refr} + RR_{refr,i,y} + DR_{refr} \quad (3)$$

Where:

$BE_{ODS\_ref,y}$	=	Baseline emissions from ODS refrigerants which would be released into the atmosphere in the absence of the project activity in year y [tCO_2e]
$M_{DESTR,refr,i,y}$	=	Quantity of ODS refrigerant i destroyed by the project activity in year y [$tODS_i$]
VR_{refr}	=	Rate of ODS refrigerants (destroyed) which would be vented into the atmosphere in the baseline [%, 0-100%]. For this project, a value of 0% is applied for stockpiled Consumer Quantity CFC. A default value of 100% is applied for ODS refrigerant recovered from end-of-life equipment.
EF_{VR}	=	Emission factor for the rate of ODS refrigerants (destroyed) which would be vented into the atmosphere [1]

DR_{refr} = Rate of ODS refrigerants (destroyed) by the project activity which would also be destroyed in the baseline [%, 0-100%].

For the purposes of this project, the default rate of 0% is used because there is no government mandate, product stewardship scheme, or other program that creates an incentive or mechanism for ODS refrigerant destruction in the Dominican Republic, where the project activity occurs.

EF_{DR} = Emission factor for the rate of ODS refrigerants (destroyed) by the project activity which would also be destroyed in the baseline [0]

$RR_{refr,i,y}$ = Rate of ODS refrigerants i which would be used, reused or remain in storage in the baseline [%, 0-100%]

For this project, a value of 100% is applied for stockpiled Consumer Quantity CFC. A default value of 0% is applied for ODS refrigerant recovered from end-of-life equipment.

$EF_{RR,refr,i,y}$ = Emission factor for the rate of ODS refrigerant i (destroyed) which would be reused in the baseline [0 -1.0]

$GWP_{refr,i}$ = Global warming potential of ODS refrigerant type i that converts 1 ton of ODS i to tons of CO_2 equivalents. [$tCO_2e/tODS_i$]

$EF_{VR} = 1$ (4)

$EF_{DR} = 0$ (5)

$EF_{RR,refr,i} = 1 - (1 - LR_{refr,i})^{tcp}$ (6)

Where:

$EF_{RR,refr,i}$ = Emission factor for the rate of ODS refrigerant i (destroyed) which would be reused in the baseline [0-1.0]

$LR_{refr,i}$ = Leak rate of ODS refrigerant i (destroyed), which would be used as refrigerant for existing equipment or remain in storage in the baseline [%,0- 100%]

For this project, the default values of the applicable annual emission rates given in the latest version of the Climate Action Reserve's *Article 5 ODS Project Protocol* will be used. Namely, a value of 25% is applied for the portion of ODS refrigerant that was part of a privately held stockpile that could legally be sold into the market, and a value of 100% is applied for the portion of ODS refrigerant recovered from equipment.

tcp = Project crediting period [10]

Because the destruction of the ODS refrigerants by the project activity is not mandated by law, statute or other regulatory framework applying in the host country (Dominican Republic), no adjustment of the baseline is required.

4.2 Project Emissions

Project emissions will be quantified using the method described in Section 8.2 of VM0016. Below are the equations used with explanation and justification of methodological choices including the selection of emission factors and default values.

Project emissions in year y are:

- Emissions that are caused by the project activity due to energy consumption at the ODS recovery facility
- Emissions that are caused by the project activity due to ODS transportation
- Emissions that are caused by the project activity due to ODS destruction

$$PE_y = PE_{Energy\_Consump,y} + PE_{ODS\_Transport,y} + PE_{ODS\_Destruction,y} \quad (14)$$

Where:

PE_y	=	Project emissions during year y [tCO_2e]
$PE_{Energy\_Consump,y}$	=	Project emissions from energy consumption at the ODS recovery facility during year y [tCO_2e]
$PE_{ODS\_Transport,y}$	=	Project emission from ODS transportation during year y [tCO_2e]
$PE_{ODS\_Destruction,y}$	=	Project emission from ODS destruction during year y [tCO_2e]

Determination of $PEEnergy\_Consump,y$:

$$PE_{Energy\_Consump,y} = PE_{EC,y} + PE_{FC,j,y} \quad (15)$$

Where:

$PE_{Energy\_Consump,y}$	=	Project emissions from energy consumption attributable to the ODS recovery facility during year y [tCO_2e]
$PE_{EC,y}$	=	Project emissions from electricity consumption from the grid at the ODS recovery facility during year y [tCO_2e]
$PE_{FC,j,y}$	=	Project emissions from fossil fuel consumption attributable to the ODS recovery facility including third party used fossil fuel to generate energy for the ODS recovery facility during year y [tCO_2e]. Since the recovery of ODS in this project does not consume fossil fuels, these emissions are assumed to be zero. In the event that this changes in the future, any associated emissions from the use of fossil fuels at the recovery facility will be calculated as described in equations 17-18 of VM0016

Determination of $PE_{EC,y}$:

$$PE_{EC,y} = EC_{PJ,y} \times EF_{grid,y} \times (1 + TDL_y) \quad (16)$$

Where:

$PE_{EC,y}$	=	Project emissions from electricity consumption from the grid at the ODS recovery facility during year y [tCO_2e]
$EC_{PJ,y}$	=	Amount of electricity consumed at the ODS recovery facility from the grid during year y [MWh]
$EF_{grid,y}$	=	Grid emission factor during monitoring period [tCO_2e/MWh] A conservative default value of 1.3 tCO2/MWh is used.
$TDL_{,y}$	=	Average technical transmission and distribution losses in the grid for the voltage level at which electricity is obtained from the grid at the project site during year y [%,0-100%] A conservative default value of 20% is used.

Determination of $PE_{ODS\_Transport,y}$ and $PE_{ODS\_Destruction,y}$:

For project emissions due to ODS transportation and destruction, the project proponent shall apply the default factors provided by the latest version of the *CAR Article 5 Ozone*

Depleting Substances Project Protocol: (Calculating Default Project Emissions from ODS Destruction and Transportation)

$$PE_{ODS_{Transport},y} + PE_{ODS_{Destruction},y} = (M_{DESTR,refr,i,y} + M_{DESTR,foam,i,y}) \times EF_{ODS\_Transport+Destruction,y} \quad (19)$$

Where:

$PE_{ODS\_Transport,y}$	=	Project emission from ODS transportation during year y [tCO_2e]
$PE_{ODS\_Destruction,y}$	=	Project emission from ODS destruction during year y [tCO_2e]
$M_{DESTR,refr,i,y}$	=	Quantity of ODS refrigerant i sent for destruction by the project activity, including eligible and ineligible material, during year y [tODSi]
$M_{DESTR,foam,i,y}$	=	Quantity of ODS blowing agent i sent for destruction by the project activity, including eligible and ineligible material, during year y [$tODS_i$]. Since this project does not involve the recovery and destruction of ODS blowing agents contained in insulation foams, this mass is assumed to be zero.
$EF_{ODS\_Transport+Destruction,y}$	=	Default emission factor aggregating both transportation and destruction emissions [tCO_2] (sourced from CAR, as above). The values used in this project will be 7.5, consistent with the conservative default value recommended in Appendix D.3 of Version 2.0 of the CAR Article 5 ODS Project Protocol.

4.3 Leakage

The baseline for ODS in the Dominican Republic is release into the atmosphere – either quickly, because it is not captured from equipment, or slowly, because it is captured and placed into stockpiles, or simply remains in stockpiles with no future use. And because the stockpiled ODS in the Dominican Republic is not sold or re-used in the country, the destruction of ODS in this Project will not lead to the production or consumption of other refrigerant chemicals, and therefore no substitute refrigerant emissions will be calculated.

$LE_{ODS\_Substitute,y} = 0$.

4.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$$ER_{ODS,y} = BE_{ODS\_refr,y} + BE_{ODS\_foam,y} - PE_y - LE_y \quad (22)$$

Where:

$ER_{ODS,y}$ = means total emission reductions during year y [tCO_2e]

$BE_{ODS\_refr,y}$ = means the baseline emissions from ODS refrigerants banks which would be released into the atmosphere in the absence of the project activity during year y [tCO_2e]

$BE_{ODS\_foam,y}$ = means baseline emissions from ODS blowing agents contained in insulation foams of refrigeration appliances which would be released into the atmosphere in the absence of the project activity during year y [tCO_2e]

PE_y = means the project emissions by the project activity during year y [tCO_2e]

LE_y = means the leakage emissions by the project activity during year y [tCO_2e]

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2021	20,020	20	0	20,000
2022	0	0	0	0
2023	20,020	20	0	20,000
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0

2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
Total	40,040	40	0	40,000

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	GWP_{ODSi} (refrigerants, blowing agents and substitute chemical)
Data unit	tCO2e/tODS$_i$
Description	Global Warming Potential of ODS$_i$
Source of data	IPCC Fifth Assessment Report (AR5)
Value applied	See IPCC Fifth Assessment Report list of values
Justification of choice of data or description of measurement methods and procedures applied	As prescribed in Section 9.1 of VM0016
Purpose of Data	Calculation of baseline emissions and leakage
Comments	

Data / Parameter	VR_{refr}
Data unit	% expressed as number [0-100%]
Description	Rate of ODS refrigerants (destroyed) which would be vented into the atmosphere in the baseline
Source of data	Default values prescribed in Section 9.1 of VM0016

Value applied	A value of 0% is applied for stockpiled Consumer Quantity CFC. A default value of 100% is applied for ODS refrigerant recovered from end-of-life equipment.
Justification of choice of data or description of measurement methods and procedures applied	As prescribed in Section 9.1 of VM0016. The Dominican Republic is an Article 5 Country
Purpose of Data	Calculation of baseline emissions
Comments	Calculated as a cumulative rate over the 10-year period following ODS destruction.

Data / Parameter	DR_{refr}
Data unit	% expressed as number [0-100%]
Description	Rate of ODS refrigerants (destroyed) which would be destroyed in the baseline
Source of data	Default value prescribed in Section 9.1 of VM0016
Value applied	0%
Justification of choice of data or description of measurement methods and procedures applied	There is no government mandate, product stewardship scheme, or other program that creates an incentive or mechanism for ODS refrigerant destruction in the Dominican Republic, where the project activity occurs.
Purpose of Data	Calculation of baseline emissions
Comments	Calculated as a cumulative rate over the 10-year period following ODS destruction.

Data / Parameter	$RR_{refr,i}$
Data unit	% expressed as number [0-100%]
Description	Rate of ODS refrigerant i (destroyed) which would remain in, or be recovered and become part of, a stockpile in the baseline

Source of data	Default values prescribed in Section 9.1 of VM0016
Value applied	A value of 100% is applied for stockpiled Consumer Quantity CFC. A default value of 0% is applied for ODS refrigerant recovered from end-of-life equipment.
Justification of choice of data or description of measurement methods and procedures applied	As prescribed in Section 9.1 of VM0016. The Dominican Republic is an Article 5 Country. Tradewater International will maintain point of origin documentation to demonstrate the quantity of ODS refrigerant not sourced from products at end-of-life.
Purpose of Data	Calculation of baseline emissions
Comments	Calculated as a cumulative rate over the 10-year period following ODS destruction.

Data / Parameter	$LR_{refr,i}$
Data unit	% expressed as number [0-100%]
Description	Leak rate of ODS refrigerant i (destroyed), which would remain in, or be recovered and become part of, a stockpile in the baseline
Source of data	*CAR Article 5 Ozone Depleting Substances Project Protocol*, Table 5.1
Value applied	A value of 25% is applied for the portion of ODS refrigerant that was part of a privately held stockpile that could legally be sold into the market, and a value of 100% is applied for the portion of ODS refrigerant recovered from end-of-life equipment.
Justification of choice of data or description of measurement methods and procedures applied	Default values as prescribed in Section 9.1 of VM0016 for Article 5 Countries. Tradewater International will maintain point of origin documentation to demonstrate the quantity of ODS refrigerant not sourced from products at end-of-life.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	$LR_{substitute,i}$
Data unit	% expressed as number [0-100%]
Description	Leak rate of substitute chemical I in year y [0-1]
Source of data	N/A
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of Data	Calculation of leakage
Comments	

Data / Parameter	Substitute chemical i
Data unit	
Description	Chemical i substituting ODS refrigerant i where in the baseline refrigerant ODS would have been re-used and in the project scenario must be substituted by other chemicals
Source of data	N/A
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of Data	Calculation of leakage
Comments	

Data / Parameter	$EF_{ODS\_Transport+Destruction,y}$
Data unit	tCO_2
Description	Default emission factor aggregating both transportation and destruction emissions
Source of data	*CAR Article 5 Ozone Depleting Substances Project Protocol: (Calculating Default Project Emissions from ODS Destruction and Transportation)*
Value applied	7.5
Justification of choice of data or description of measurement methods and procedures applied	Default values as prescribed in Section 9.1 of VM0016 for Article 5 Countries.
Purpose of Data	Calculation of project emissions
Comments	

5.2 Data and Parameters Monitored

Data / Parameter	$M_{DESTR,refr,i,y}$
Data unit	tODSi
Description	Quantity of ODS refrigerant i destroyed by the project activity in year y
Source of data	• Operation logbook of recovery facility • Identification note for each individual ODS container by a bill of lading • Certificate of Destruction for each individual ODS container
Description of measurement methods and procedures to be applied	Refer to Section 9.3 of the VM0016 methodology “Monitoring Methodology” and Section VI of the Tradewater International VCS Monitoring Plan

Frequency of monitoring/recording	Each container with ODS sent to destruction
Value applied	Tradewater International estimates a value of 3.9 tons of ODS.
Monitoring equipment	Calibrated scales at the destruction facility
QA/QC procedures to be applied	All measurements should be conducted with calibrated measurement equipment according to relevant industry standards (refer to Section 9.3 of VM0016 "Monitoring Methodology" and Section VI of the Tradewater International VCS Monitoring Plan)
Purpose of data	Calculation of baseline emissions, project emissions, and leakage
Calculation method	This parameter will be calculated using the weight of the refrigerant destroyed and the results of the refrigerant analysis: $M_{DESTR,refr,i,y} = \Sigma_k M_{DESTR,refr,k} \times (1-C_{m,k}/10^6 - C_{HBR,k}/100) \times (C_{ODS,i,k})$ Where: • $M_{DESTR,refr,k}$ is the total mass of refrigerant destroyed from container k [t], • $C_{m,k}$ is the concentration of moisture in the refrigerant in container k [ppm], • $C_{HBR,k}$ is the concentration of high boiling residue in container k [wt %], • $C_{ODS,i,k}$ is the concentration of ODS refrigerant i in container k [wt %]
Comments	

Data / Parameter	$EC_{PJ,y}$
Data unit	MWh
Description	Amount of electricity consumed at the ODS recovery facility from the grid during year y

Source of data	Utility bills, invoices, or statements
Description of measurement methods and procedures to be applied	Electricity consumption is measured by the utility company. The recovery of ODS refrigerants represents only a fraction of the work performed at the recovery facility and therefore only a fraction of the electricity consumption is attributable to the project. However, sub-metered electricity consumption data for these activities is not available. Therefore, the recovery facility will retain records sufficient to document the days on which ODS refrigerant recovery occurs and the total electricity consumption will be prorated.
Frequency of monitoring/recording	N/A
Value applied	0.0 MWh per year
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	

Data / Parameter	$EF_{grid,y}$
Data unit	tons CO_2/MWh
Description	Grid emission factor during the monitoring period y
Source of data	Default value prescribed in VM0016
Description of measurement methods and procedures to be applied	Default value as prescribed in Section 9.2 of VM0016
Frequency of monitoring/recording	N/A
Value applied	1.3
Monitoring equipment	N/A

QA/QC procedures to be applied	N/A
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	

Data / Parameter	TDL_y
Data unit	%
Description	Average technical transmission and distribution losses in the grid for the voltage level at which electricity is obtained from the grid at the project site during year y
Source of data	Default value prescribed in VM0016
Description of measurement methods and procedures to be applied	Default value as prescribed in Section 9.2 of VM0016
Frequency of monitoring/recording	N/A
Value applied	20%
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	

5.3 Monitoring Plan

Tradewater International will rely on the *Monitoring Plan for the Acquisition and Destruction of ODS Pursuant to the Verified Carbon Standard Methodology VM0016* attached as Appendix F in order to obtain, record, compile and analyze the monitored data and parameters set out in Section 5.2.