



**Verified Carbon
Standard**

INSTALLATION OF HIGH EFFICIENCY WOOD BURNING COOKSTOVES IN ANGOLA – PROJECT 2



Document Prepared by Earthood Services Private Limited

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Report Title	Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2
Client	C-Quest Capital SG Angola Stoves Private Limited
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Summary:

Earthood Services Private Limited (hereafter referred to as ESPL) has been contracted by C-Quest Capital SG Angola Stoves Private Limited to conduct the validation of the grouped project - 'Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2' (VCS ID – 2981), with regards to the relevant requirements of VCS, which includes the following: VCS Program Guide (v4.2), VCS Standard (v4.3), Program Definitions (v4.2), Registration and Issuance Process (v4.2), VCS Validation and Verification Manual (v3.2) applicable at the time. Relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting has been applied for validation.

The validation includes complete and independent review of the proposed project activity against applicable VCS requirements, including the baseline, monitoring plan, and compliance with the relevant VCS and host party criteria and the methodology as per VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1.

The project activity is about distribution and installation of high efficiency wood burning TLC stoves for household purpose in Angola. The installed stoves are called as TLC-CQC Rocket Stove. These high efficiency TLC-CQC Rocket Stoves (ICS) replace the existing inefficient, conventional open fire stoves. These improved cookstoves will burn wood more efficiently as compared to the baseline stoves and thus will save the amount of wood burnt in cooking purpose and emissions associated with it. The project activity also reduces deforestation in the host country and minimizes the health risks associated with indoor smoke pollution. Further, the project activity also reduces the time for collection of firewood for women and children.

The purpose of validation is to have a thorough and independent assessment of the proposed project activity against the applicable VCS requirements. These are validated in order to confirm that the project document is statistically sound and reasonable and meets the relevant criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation and reporting of emission reductions. ESPL's objective is to perform a thorough, independent assessment of the validation of the project activity.

The validation, which was conducted following ESPL's internal quality procedures, consisted of the following phases:

- a) Document review, involving:
 - A review of data and information.
 - Cross checks between information provided in the PD and information from sources other than those used, if available, and if necessary independent background investigations.
- b) Follow-up actions (e.g., remote audit and telephone or email interviews), including:
 - Interviews with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation.
 - Cross checks between information provided by interviewed personnel (i.e., by checking sources or other interviews) to ensure that no relevant information has been omitted.
- c) Reference to available information relating to projects or technologies similar to the proposed project activity under validation.
- d) Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations.

A risk-based approach has been followed to perform this validation. During validation, 03 Corrective Action requests (CARs), 00 Forward Action requests (FARs), and 09 Clarification requests (CLs) were raised and successfully closed.

The review of the project documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, remote site visit, telephonic interviews and stakeholders have provided ESPL with sufficient evidence to validate the fulfillment of the stated criteria.

Based on the information seen and evaluated we confirm that the estimated annual average and total emission reductions from the project activity, for the crediting period 01/09/2021 to 31/08/2031 are expected to be 1,382,745 tCO₂e and 13,827,457 tCO₂e. Therefore, the project is being recommended to VCS for request for registration.

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1 INTRODUCTION

1.1 Objective

Earthood Services Private Limited has been contracted by C-Quest Capital SG Angola Stoves Private Limited, to undertake the validation of the project titled – ‘Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2’ (VCS ID – 2981). The validators have reviewed the monitoring methodology and implementation plan.

The purpose of this validation is to have an independent third-party assessment of whether the project activity conforms to the qualification criteria set out in the VCS Standard version 4.3 to attain real, measurable, additional, and permanent emission reductions. The validation statement is a written assurance that:

- The project complies with all the applicable VCS requirements and has the ability to generate the emission reductions stated over the project’s crediting period.
- The validation followed the requirements of the current version of the VCS Standard v4.3 and program guide v4.2 to ensure quality and consistency of the validation work and the report.
- The project has proposed emission reductions based on ex-ante estimation under the applied methodology as declared by the organisations or GHG project’s GHG assertion.
- The data/information reported is accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

The validation scope is given as an independent and objective review of the project design, the project’s baseline demonstration, additionality assessment and proposed monitoring plan which is included in the VCS PD and other relevant supporting documents.

The scope of work covered in the validation is described below:

To validate whether the project activity meets the requirements of VCS Program Guide (v4.2)/7/, VCS Standard (v4.3)/6/, Program Definitions (v4.2)/10/, Registration and Issuance Process (v4.2)/9/, and VCS Validation and Verification Manual (v3.2)/8/, including additionality, proof of title, and compliance with local laws.

To evaluate whether the baseline and monitoring plan are in conformance with the applied methodology/3/ from the VCS approved GHG program.

Background investigation and follow up interviews with the concerned representative.

To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.

The information in the VCS PD/1.2/ is reviewed against the criteria of VCS Standard Version 4.3/6/, VCS Program Guide Version 4.2/7/, and the approved baseline and monitoring VCS methodology VMR0006, version 1.1/3/.

ESPL has performed validation based on a risk-based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Verified Carbon Units (VCUs).

1.3 Level of Assurance

☒ Reasonable Level of Assurance

☐ Limited Level of Assurance

The level of assurance of the validation report falls under reasonable assurance engagements. Reasonable assurance is high level of assurance regarding material misstatement, but not an absolute one.

Reasonable assurance includes the understanding that there is a remote likelihood that material misstatement will not be prevented or detected on a timely basis. To achieve reasonable assurance, the auditor needs to obtain sufficient appropriate audit evidence to reduce audit risk to an acceptable low level. This means that there is some uncertainty arising from the use of sampling, since it is possible that a material misstatement will be missed.

The evidence used to achieve a reasonable level of assurance is specified in section 2.3 and 2.4 of this report.

1.4 Summary Description of the Project

The project activity is a grouped project activity for distribution and installation of high efficiency TLC wood burning stoves for household purpose in Angola. The project activity applies approved baseline and monitoring VCS methodology; VMR0006 version 1.1. The grouped project involves distribution of fuel-efficient improved cook stoves (TLC-CQC Rocket Stoves) in Angola. Under this project, each household will receive maximum two units of Total Land Care Rocket Stoves. C-Quest Capital SG Angola Stoves Private Limited is the Project Proponent for this project activity.

As per the PD, the project activity will distribute 500,000 fuel-efficient ICS through 4 years, which comes to an average of 125,000 ICS per year. The TLC-CQC Rocket Stoves will

significantly reduce the fuel usage and emissions while cooking. Furthermore, women and children will spend less time collecting firewood. The usage of ICS creates carbon finance, which is then utilised to recover the cost of ICS and project implementation costs. This fact will be made clear to the end user in advance. Each ICS is considered as a Project Activity Instance, by the PP. The first stove under this project activity was installed on 01/09/2021, which is also the start date of the project activity.

Over the 10 years of crediting period (01/09/2021 to 31/08/2031), the project activity “Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2”, will replace anthropogenic emissions of greenhouse gases (GHGs) estimated to be approximately 1,382,745 tCO₂e per year and 13,827,457 tCO₂e for the entire crediting period.

2 VALIDATION PROCESS

2.1 Method and Criteria

The validation process is undertaken by the validation team that involves the following:

- A desk review of documents and evidence submitted by the Project Proponent in context of the reference VCS Rules and Guidelines (VCS Standard v4.3/6/ and VCS Program Guide v4.2/7/),
- Undertaking interviews or interaction with the representatives of the Project Proponent/11/,
- Reporting Audit Findings with respect to Clarifications and Non-Conformities and the closure of findings, as appropriate and
- Preparing a draft validation report
- Resolution of outstanding issues and the issuance of final validation report and opinion

In order to ensure transparency, ESPL produces a validation checklist which is based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the validation approach and the sampling plan.

The Clarification Requests (CLs) were issued where additional information was needed to clarify any issues/doubts that VVB had, and Forward Action Requests (FARs) for issues related to the project implementation that required review during the first verification of the project activity.

2.2 Document Review

The validation team has conducted the validation using the VCS Standard v4.3/6/ and the VCS methodology VMR0006 Version 1.1 Methodology/3/ as the reference criteria. A desk review was carried out by the validation team to assess the following:

- Information of project details in compliance with the latest VCS PD Template
- Appropriateness of methodology VMR0006 version 1.1 applied to the project activity
- Compliance with relevant laws and regulations
- Correctness of application of baseline and monitoring methodology
- Monitoring plan as described in VCS PD
- Stakeholder Consultation
- Proof of listing of project under pipeline
- Calculation of Ex-ante emission reductions etc.

The VCS PD Version 1.0 dated 09/02/2022/1.1/ was initially reviewed and the PP was requested to submit the revised documents along with supporting evidence. The revised documents and additional supporting evidence were further assessed by the validation team during desk review. During the validation process, the revised VCS PD (Version 2.2, dated 24/02/2023)/1.2/ and the supporting evidence were assessed to confirm the actions taken by the PP for the closure of Audit Findings raised by the VVB.

Further, prior to the start of validation process, it was verified by the validation team that the project was listed in the VCS Registry.

Ref: <https://registry.verra.org/app/projectDetail/VCS/2981/>

2.3 Interviews

Due to the current situation with the global COVID-19 pandemic scenario and also its outbreak in Africa/18/ physical site inspection was not done for the current validation. Furthermore, as per the Section 4.1.2 of the VCS Standard, v4.3/6/, it is not mandatory to conduct the on-site visit by VVB for validation.

However, alternative means were selected to verify the project implementation. Along with alternative approach, remote interviews via video call with the end users, PP's representatives and implementation partners were conducted to discuss the aspects of project implementation such as monitoring plan, the operation of ICS, and other details like beneficiaries' feedback, actual ongoing implementation on site. The required documents and details for the validation of the project activity implementation were collected from PP.

The remote audit and interviews for the project location, by the assessment team, was conducted from 20/06/2022 to 21/06/2022 and the following stakeholders were interviewed/11/.

S. No.	Name	Affiliation	Date	Topics Covered	Team Member
1	Sanjith Kakkat (Associate – Carbon and Sustainability Accounting)	CQC	20/06/2022 – 21/06/2022	Project Design Start Date and Location Monitoring system, roles, and responsibility	Dr. N. Premjit Singh Arohi Jain Shifali Guleria
2	Neha Oli (Associate – Carbon and Sustainability Accounting)	CQC		QA/QC procedures, Baseline scenario Criteria and compliance of new instances added	
3	Elsa Pedro (Compliance Coordinator Angola)	CQC		Ongoing LSC process Compliance with relevant laws Predicted Social and Environmental impacts of the project Additionality of the project Baseline stoves Baseline fuel type	
4	Joseph Dumbo (Manager)	Implementation Partner – Choose Water	20/06/2022 – 21/06/2022	Procedure for data collection Record keeping procedure	Dr. N. Premjit Singh Arohi Jain Shifali Guleria
5	Jaco Joubert (Director)	Implementation Partner – Choose Water		Robustness and accuracy of data	

				collection and transfer Integrity of Data Cost charged to the end users for the stoves. Baseline stoves Baseline fuel type	
6	Manuel Paulo Simao	LSC Attendee	20/06/2022 – 21/06/2022	Mode of LSC	Dr. N. Premjit Singh Arohi Jain Shifali Guleria
7	Paulo Vicente	LSC Attendee		Procedures or methods used for engaging local stakeholders Procedures or methods used for documenting the outcomes of LSC The mechanism for on-going communication with local stakeholders Feedbacks Cost charged for the stoves Stoves used before the project implementation Fuel used in the previous stoves.	
8	Elena Sônia	End user	20/06/2022 – 21/06/2022	Operation and usage pattern of stoves	Dr. N. Premjit Singh Arohi Jain
9	Jonathan Walende	End user			

10	Angelina Maria	End user		Cost charged for the stoves	Shifali Guleria
11	Pedro Kalava	End user		Stoves used before receiving the ICS	
12	Flora Katuma	End user		Fuel used in the previous (old) stoves	
13	Laurinda João	End user		Feedback on the ICS installed and ongoing LSC activities by PP Training and Ongoing support provided by PP for operation of stoves Social and Environmental Benefits from the project activity	
14	Mbayeta Nolote	End user	20/06/2022 – 21/06/2022	Operation and usage pattern of stoves	Dr. N. Premjit Singh Arohi Jain Shifali Guleria
15	Joana Camia	End user		Cost charged for the stoves Stoves used before receiving the ICS Fuel used in the previous (old/ traditional) stoves Feedback on the ICS installed and ongoing LSC activities by PP	

				Training and Ongoing support provided by PP for operation of stoves Social and Environmental Benefits from the project activity	
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Through the interviews conducted and comparing them with the evidence and survey conducted by the PP, the assessment team confirms the project will be implemented in line with the VCS PD/1.2/.

2.4 Site Inspections

As discussed in the above section, physical site inspection was not done for validation. However, to achieve a reasonable level of assurance, the assessment team has followed the alternative means to substantiate the validation criteria.

The validation team has carried out remote audits by video calls in order to assess the conditions on site and cross checking the information through desk review. A reasonable level of assurance can be provided by ESPL through remote audits, which is in conformance with the relevant VCS Rules and Guidelines.

A remote audit/11/ was undertaken by ESPL from 20/06/2022 to 21/06/2022 via video call to carry out the following:

An assessment of the operation of the registered project activity as per the VCS PD/1.2/.

A review of information flows for generation, aggregation and reporting of the parameters.

Interview with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD.

A review of calculation and assumptions made in determining the GHG data and emission reduction.

Sampling approach for Remote audit:

The validation team confirms that the sample size and selection is in accordance with requirements of paragraph 26 and 27 of Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities/4/ with a 90/30 confidence/precision level.

The assessment team has applied random sampling on the implementation database/19/ to check the implementation of the project activity. The sample size was determined using

Raosoft website/20/, where information including total number of households with project stoves and desired confidence precision (90/30) was fed and a resulting sample size was obtained. The minimum number of samples required to be verified was 8. However, 3 additional 3 end users were also picked for back up. In this case, the validation team could remotely survey the selected total of 8 household samples as they were available. Therefore, the 3 back up additional households were not interviewed.

The information provided in the database has been cross checked with results of interviews. By the means of random sampling, the assessment team could verify that there is no discrepancy in the database as provided by the PP. The validation team has also carried out remote interviews with stakeholders, implementers, representatives of PP/11/ in order to assess the information included in the project documentation.

2.5 Resolution of Findings

The list of findings and their resolution are presented in Appendix 3 of this validation report. The section also includes the response, if provided, by the project proponent and an assessment by the assessment team if it was closed or otherwise. The assessment is done based on the desk review and interaction with various stakeholders over phone. The validation team prepares and/or updates a validation protocol (internal document) that records the conformities and non-conformities, which may be of following types.

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project proponent, or if the evidence provided to prove conformity is sufficient.
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions.
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project proponent.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

All CARs and CLs raised by the ESPL during validation shall be resolved prior to submitting a request for issuance. All the findings that are raised and communicated to project proponent during the validation are included under Appendix 3. The section also includes the response, if provided, by the project proponent and an assessment by the validation team if it was closed out or otherwise.

A total of 09 Clarification Requests (CLs), and 03 Corrective Action Requests (CARs) were raised during the validation and successfully closed. The list of findings raised, and the response provided, the mean of validation, reasons for closure and references to correction in the relevant documents are provided in Appendix 3 of this report.

2.5.1 Forward Action Requests

Forward Action Request (FAR) is raised during validation if the monitoring and reporting require attention and/or adjustment for the first verification period. FAR does not relate to VCS requirements for issuance of ERs achieved during subject monitoring. FARs subject to project implementation plan.

No FARs were raised during the ongoing validation.

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project:

As per UNFCCC and VCS Standard/6/, the project type of this project activity falls under Type II – Energy Efficiency Improvement Projects with Sectoral Scope 03 – Energy Demand.

The project activity “Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2” is a grouped project activity using VCS approved methodology-VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1. It involves distribution of fuel-efficient improved cookstoves (ICS) with an efficiency of 34.5% in Angola. The high efficiency ICS will replace the conventional open fire stoves. These ICS will burn wood more efficiently as compared to baseline stoves and thus will save the amount of wood burnt for cooking purpose and emissions associated with it. The project activity also reduces deforestation in host country and minimizes the health risks associated with indoor smoke pollution. Furthermore, the project activity also reduces the time for collection of firewood for women and children.

As per the PD, the project activity will distribute 500,000 fuel-efficient ICS through 4 years, which comes to an average of 125,000 ICS per year. The TLC-CQC Rocket Stoves will significantly reduce the fuel usage and emissions while cooking. Each ICS is considered as a Project Activity Instance, by the PP. The first stove was installed on 01/09/2021, which is also the commissioning date of the project activity.

Over the 10 years of first crediting period (01/09/2021 to 31/08/2031), the project activity “Installation of High Efficiency Wood Burning Cookstoves in Angola – Project 2”, will replace

anthropogenic emissions of greenhouse gases (GHGs) estimated to be approximately 1,382,745 tCO₂e per year and 13,827,457 tCO₂e for the entire crediting period.

The project activity involves the construction of TLC Stoves using locally available clay and 15 bricks. The standard size of the bricks used will be 22 cm x 11 cm x 6.5 cm. The bricks will be joined together using a mixture of 3 liters clay, 3 liters sand, 3 liters manure/cow dung and 5 liters of water. This will ensure better insulation and less heat loss. This was verified using the construction and maintenance brochure/22/ and the Rural Cookstove Training Manual/15/.

The main technical parameters of TLC-CQC Rocket Stoves are shown in the table below:

Technical Specifications	
Stove Size	Depth: 34.5 cm Width: 34.5 cm Height: 28 cm
Efficiency	34.5 %
Average Life	10 years

The purpose of the project activity is to reduce the greenhouse gases emissions, by reducing the consumption of non-renewable biomass. It will do so by burning wood more efficiently which will then improve the thermal transfer to pots, thereby saving fuel. Section 1.1 of VCS PD provides a clear summary of the project activity, whose accuracy and completeness are validated by the VVB during the remote audit/11/.

Eligibility criteria of the project activity

Section 1.4 of the PD clearly states the eligibility criteria, and then justifies the inclusion of project activity instances for the VCS methodology.

S. No.	Eligibility criteria for the inclusion of new project	Applicability	Assessment by the validation team
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	activity instances		
1.	Methodology: Meet the applicability conditions set out in the methodology applied to the project.	The project activity instance shall use VCS approved methodology-VMR0006: Methodology for Installation of High Efficiency Cookstoves, Version 1.1 and shall meet the applicability conditions set out in the methodology.	The validation team reviewed the applicability conditions of the new project activity instances which can be confirmed in Section 3.3.2 of this Validation Report. Therefore, the requirements for the new project activity instances under this group project have been satisfied.
2.	Technology: Use the technologies and measures specified in the project description	The project activity instance shall implement TLC-CQC Rocket Stoves having minimum efficiency of 25%; below which it shall not be eligible under this grouped project.	The validation team determines that PP will only use the TLC CQC Rocket stove and no other stove type under this grouped project after reviewing the relevant documents and conducting remote interviews/11/. The PD refers to this as well. As a result, the requirements for the new project activity instances under this group project have been satisfied.

3.	Baseline Scenario: Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	All new project activity instances will be installed within Angola only and the baseline scenario is the continued use of non-renewable wood fuel by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity. This also conforms to the applied methodology.	The validation team determines that the baseline is demonstrated in section 3.4 of the PD through document review and remote interviews/11/. Within the project boundary, PP will only replace the baseline cookstoves with TLC CQC Rocket stoves. As a result, the requirements for the new project activity instances under this group project have been satisfied.
4.	Additionality: Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	Each project activity instance shall demonstrate its compliance with: 1. Regulatory Surplus The project should not be mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced	The validation team examined the documents and conducted remote interviews/11/ to determine if PP has proven additionality in accordance with methodology VMR0006 version 1.1/03/ section 7, which specifies the activity approach to prove additionality. PP has proved regulatory surplus in

		law, statute or other regulatory framework 2. Positive List The inclusion of new project activity instances shall have to comply with positive list that is the ICS are installed/ distributed at zero cost to end user and the project activity instance has no other source of revenue but GHG credits.	accordance with the rules and requirements for regulatory surplus outlined in the most recent version of the VCS Standard/06/, and it can be validated that the project is not imposed by any law, statute, or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically implemented legislation, statute, or other regulatory framework. Additionally, the project activity satisfies every requirement of the applied methodology VMR0006, version 1.1/03/, for applicability, provides stoves at no cost to the end users, and derives all its income from the sale of GHG credits. Therefore, the project is eligible for the positive list. As a result, the requirements for the new project activity instances under this group project have been satisfied.
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5.	Occur within one of the designated geographic areas specified in the project description	All new project activity instances will be installed within Angola only.	The assessment team has reviewed the project activity instance database/19/ containing geographical coordinates of each household.
6.	Ownership: Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance	A default Beneficiary Agreement for end users including the provision that emission reductions generated by the project activity are owned by the Project Proponents will be provided for project activity instance.	The assessment team has examined the copy of consent letters/ End user agreement/14.2/ given by end users to project participant regarding emission reduction claims.
7.	Start Date	The start date of project activity instance shall be same as or later than the grouped project start date.	The assessment team reviewed the Project activity instance database/19/ containing date of installation of each ICS.
8.	Where a capacity limit applies to a project activity included in the project, no project activity	1. The aggregate energy savings by a single project activity shall not exceed the equivalent of 180 GWh _{th} /year	The assessment team reviewed the Project activity instance ER spreadsheet/2.2/ containing estimation of annual energy saving from each

	instance shall exceed such limit.	as mentioned in the methodology AMS II G: Energy efficiency measures in thermal applications of non-renewable biomass. 2. Each project activity instance that exceeds one percent of the capacity limit (i.e., 1.8 GWh _{th}) shall be identified. 3. Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall	project activity instance.
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		not be assigned to clusters.	
9.	Double Counting	The Improved Cookstove distributed under this project shall be uniquely identifiable based on the distribution records.	The assessment team has examined the copy of consent letters/ End user agreement/14.2/ given by end users to project participant regarding emission reduction claims containing corresponding end user details (i.e., name, geographical coordinates, unique serial number) and the Project Activity Instance Database/19/ containing unique serial number of each ICS.
10.	Target Population	End user for each project activity instance shall be households, with non- renewable biomass on inefficient wood or charcoal stoves. Each ICS will be assigned a unique serial number with name of ICS user, address, GPS of household, stove	The assessment team reviewed the End user agreement/14.2/ given by end users to project participant regarding emission reduction claims containing corresponding end user details (i.e., name, geographical coordinates, unique serial number), the Project Activity Instance Database/19/ and through remote interviews/11/.

		model, distribution date, etc.	
11.	Crediting period	Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only). Note that where a new project activity instance starts in a previous verification period, no credit may be sought for GHG emission reductions or removals generated during a previous verification period (as set out in Section 3.4) and new instances are eligible for crediting from the start of the next verification period.	In accordance with the supporting document 'Manufacturer specifications'/17/ submitted by the PP the ICS distributed has a lifetime of 10 years. Accordingly, PP has opted for a crediting period of fixed 10 years which is in line with the VCS standards.

Project Proponent and Other Entities Involved in the Project:

The project activity is developed by C-Quest Capital SG Angola Stoves Private Limited. C-Quest Capital SG Angola Stoves Private Limited is the Project Proponent (PP) having overall operational control and ownership of the grouped project activity. This has been verified from the consent letter submitted by the PP declaring the ownership of the grouped project/12/ and by checking sample records of consent deed signed by end user to transfer all rights for carbon credits to the PP/14.2/.

Project Start date:

As per VCS Guidelines, the project start date is the date on which the project is commissioned on or the date on which the first ICS was installed. Hence, the start date of the project activity is 01/09/2021. This has been verified by the proof of start date as submitted by the PP which contains the end user's name, GPS location, Stove Serial Number, Family size, record ID and Date of Installation/14.1/.

Project Crediting Period:

The crediting period of the project activity is from 01/09/2021 to 31/08/2031, fixed for ten years.

Project Scale and Estimated GHG Emission Reductions or Removals:

The estimated annual emission reductions for the project activity are 1,382,745 tCO₂e per year (proposed annualized average value) which is greater than 300,000 tCO₂e per year. Hence, the category is applicable under 'Large Project'.

Project Location:

The project is located in the Republic of Angola.

The proposed geo-coordinates are as follows:

Latitude	Longitude
11°12'9.7" S	17°52.433' E

Conditions prior to project initiation:

The project activity involves distribution and installation of high efficiency TLC wood burning stoves for household cooking purpose in Angola. The TLC-CQC Rocket Stove will reduce the amount of non-renewable fuel used for cooking and emissions released associated with the burning of wood. These project stoves will replace the inefficient, conventional open fire stove in the baseline.

In the absence of this project activity, the continuation of current practice i.e., the target population would still be using the traditional pot support or three-stone fire, which would have ensured continuous use of non-renewable fuelwood, to meet similar energy requirements as compared to that of project stoves. The main emissions in the pre-project scenario are the additional fuel consumption by conventional open fire stoves, and the main GHGs involved are CO₂, N₂O, and CH₄.

Project compliance with applicable laws, statutes, and other regulatory frameworks:

The project is a voluntary initiative by the project proponent and has not been implemented to meet any local/national laws or regulatory compliances. The project activity is in compliance with current laws and regulations and there are no legal and/or regulatory requirements that prevent the project implementation.

The project is in compliance with local/national laws and regulations:

- a) Basic Environmental Law, No. 5/98
 - To provide the basic principles of preserving and protecting the environment, of promoting quality of life and the rational use of natural resources, in accordance with Constitutional Law.
- b) General Regulation for Environmental Impact Assessment and the Environmental Licensing Procedure, Decree No. 117/20
 - To establish rules and procedures for the environmental impact assessment of public and private projects and the environmental licensing procedure for activities that are likely to cause significant environmental and social impact, as well as applicable fees and fines for noncompliance.
 - To revoke Environmental Impact Assessment Law, Decree No. 51/04 and Environmental Licensing Law, Decree No. 59/07.

Ownership and other programs:

Right of use

The project is developed and owned by C-Quest Capital SG Angola Stoves Private Limited. The cookstoves have been purchased and distributed free of cost to the beneficiaries by the PP. The ownership of ICS remains with the beneficiary, while the ownership of emission reductions is with the PP.

The ownership of the project activity is verified through a random selection of declarations signed by the participating households transferring their ownership rights for carbon credits arising from this project to the PP/14.2/.

Participation under other GHG programs:

- **Projects registered (or seeking registration) under other GHG program(s)**

The project has not been registered, and it has no plans to register under any other GHG program.

- **Rejection by other GHG programs**

The project has not been rejected by any other GHG program

- **Additional information relevant to the project**

- Leakage management for AFOLU projects

As per the project adopts a net gross adjustment factor of 95% to account for leakage, this is not applicable.

- Commercially sensitive information

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

- **Sustainable development contributions**

The project contributes to long-term development in several ways:

- a) Environmental Sustainability

- Reduce GHG emissions
 - Reduce the use of non-renewable biomass from forests to help conserve existing forest stock and protect natural forest eco-systems and wildlife habitats

- b) Social Sustainability

- Time saved on wood harvesting thereby reducing the workload on families and as well as presenting alternative economic development opportunities
 - Health benefits from reduced exposure to air pollution caused by biomass combustion
 - Reduce accidental burn risk

- c) Economic Sustainability

- Employment of local people throughout the project's manufacturing, distribution, and monitoring.
 - The use of the ICS will minimise household expenses on cooking fuel.

- Household labour can be redeployed to more profitable economic endeavours.
- Local employment will be created in operational and management roles, as well as potential assembly and/or manufacturing activities, because of the project.

The validation team concludes that the description in the project description is accurate, complete, and provides an understanding of the nature of the project.

3.2 Safeguards

3.2.1 No Net Harm

The project activity will not involve any negative environmental or socio-economic impacts, as it consists of the distribution and installation of ICS. Hence, no mitigation measures are required.

3.2.2 Local Stakeholder Consultation

The local stakeholder consultation process has been described in detail, by the PP, in Section 2.2 of the VCS PD/1.2/. The Project Proponent correctly identified the relevant stakeholders such as the people residing in Angola, local employee, representatives of the affected people residing in project area.

Local stakeholder consultation process was conducted in the online mode during the design phase through inviting the relevant stakeholders to comment on the project activity. The local stakeholder meeting was held on 13/08/2021 and 17/08/2021, between two groups consisting of representatives at both, the national and provincial level.

Stakeholder comments and suggestions were invited for the project activity by means of newspaper advertisement in 'Journal of Angola' on 16/07/2021.

No negative comments were received from the stakeholders. This project activity was appreciated by the stakeholders considering how the project activity will raise the standard of living for rural households and will bring a positive impact to the community.

3.2.3 Environmental Impact

The project activity does not involve any negative environmental impacts and doesn't require an Environmental Impact Assessment (EIA) to be conducted. The project activity involves distribution of energy efficient improved cookstoves, which requires less amount of fuel compared to the open fire stoves. Hence, the validation team is of the opinion that the project complies with environmental regulations in Angola.

3.2.4 Public Comments

In accordance with the requirement in clause 3.17.6 of the VCS Standard Version 4.3/6/. All projects are subject to a 30-day public comment period. The date on which the project is listed on the project pipeline marks the beginning of the project's 30-day public comment period'.

The PP listed their project activity in the VCS Pipeline for 30 days from 09/05/2022 to 08/06/2022 (<https://registry.terra.org/app/projectDetail/VCS/2981>) for public comments.

No negative comments were received during the commenting period.

3.2.5 AFOLU-Specific Safeguards

As the project activity is a non-AFOLU project, this section is not applicable.

3.3 Application of Methodology

3.3.1 Title and Reference

The project activity has applied VCS approved methodology VMR0006 Version 1.1/3/.

Title: Methodology for Installation of High Efficiency Firewood Cookstoves

3.3.2 Applicability

All applicability conditions of the updated version of methodology/3/ are met. Thus, the methodology is deemed fully applicable for this crediting period and no request for deviation with regards to the applicability of the methodology is required. All applicability conditions are completely and correctly included in the VCS PD.

Applicability Conditions	Eligibility Justification by the PP	VVB Assessment
Project activities must introduce efficiency improvements in thermal applications of non-renewable biomass in the following premises: households, community-based kitchens,	The proposed project involves deployment of Improved cookstoves which leads to improvement in thermal application of firewood (non-renewable biomass) in household premises.	The project activity is implemented by distributing highly efficient (34.5% efficiency) ICS in households for cooking purposes (thermal applications of non-renewable biomass). This has been confirmed during the remote site audit/11/ and the end-

institutions (e.g., schools) or small and medium-sized enterprises (SMEs)		user agreement/14.2/ signed by beneficiaries confirming their GPS coordinates.
The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or multi-pot; in case of project stove replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.	For the present project activity instance, TLC Rocket Stoves (or other ICS models may be added) are envisaged to be distributed in end user households. TLC Rocket stoves having an efficiency of 34.5% as per the manufacture's specification.	According to the manufacturer's specifications/17/, the efficiency of ICS is 34.5% which is greater than 25% as mentioned in the applicability conditions. This has been validated using the report for 'Results of Testing the TLC 15 Brick Rocket Stove' by conducting a Water Boiling Test/16/.
Both 'Projects' and 'Large Projects' can use this methodology.	The proposed project is expected to generate 1,382,745 tonnes CO2 per year which is greater than 300,000 tonnes CO2 per year and thus qualifies as a "large project:" as per section 3.9.1 of the VCS Standard version 4.3.	According to Section 3.9.1 of VCS Standard v4.3, Large projects are projects having GHG Emission Reductions greater than 300,000 tonnes of CO2e per year. The estimated annual average emission reductions by the project activity is 1,382,745 tCO₂e as calculated in the Final

		Emission Reduction Calculation Spreadsheet/2.2/.
Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	Non-renewable biomass has been used since 31 December 1989 in Angola as demonstrated in the VCS PD.	This has been confirmed by the assessment team using the Global Forest Resources Agreement 2010 (FAO)/21/ which indicates that since 1990, forest area has declined yearly.
For the specific case of biomass residues processed as a fuel (e.g., briquettes, wood chips), it shall be demonstrated that: (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). (b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable	Not applicable for this project activity. The ICS is introduced as energy efficiency measure to replace baseline stoves and will reduce the use of non-renewable biomass used for cooking.	As the project activity is replacing baseline stoves and will reduce the consumption of non-renewable biomass. Thus, this condition is not applicable.

biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.		
The CDM-PDD or CDM-PoA-DD/CPA-DD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g., programme logo).	Each ICS in this project will be identified by a unique combination of customer name and geographical location, as well as a serial number. The serial number will be a unique number which will allow for a clear distinction between the stoves. No individual serial number can be repeated within the project, thus ensuring that each stove is counted only once in the proposed project.	To avoid double counting, the project activity instances are identified by a unique serial number along with a QR code. The serial number and the QR code are generated by VOGIS app which is used by the PP to enter information of all beneficiaries at the time of registration. The validation team could confirm this during the remote audit^{11/} and the sample end-user agreements/14.2/.
The CDM-PDD or CDM-PoA-DD/CPA-DD shall	The stove manufacturers/wholesale providers/end users shall	To avoid double counting, declarations will be signed by the

also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	sign an undertaking stating clearly that the PP or an entity authorized by it shall be the sole owner of the VCUs arising from the project.	stove manufacturers/ wholesale providers/ beneficiaries recognizing the PP as the sole owner of the project activity. The assessment team confirmed this using the sample end user agreements/14.2/ submitted by the PP.
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3.3.3 Project Boundary

The project boundary is correctly identified in the VCS PD/1.2/ and is in accordance with the methodology applied/3/. The sources of greenhouse gasses have been reported correctly and are deemed appropriate. This has been validated using the database/19/ submitted by the PP and all the related documents. CO₂, CH₄ and N₂O have been identified as major sources of GHG in the baseline and project scenario.

Source		Gas	Included?	Justification/Explanation
Baseline	Emission from use of non-renewable biomass/Fossil fuel	CO ₂	Yes	Major source
		CH ₄	Yes	Major source
		N ₂ O	Yes	Major source
		Other	No	No other source identified
Project		CO ₂	Yes	Major source

	Emission from use of non-renewable biomass	CH ₄	Yes	Major source
		N ₂ O	Yes	Major source
		Other	No	No other source identified

3.3.4 Baseline Scenario

As mentioned in the VCS PD – ‘The baseline scenario is the continued use of non-renewable wood fuel (firewood) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity’. This is in line with the applied methodology/3/.

3.3.5 Additionality

PP has demonstrated additionality based on the activity method of applied methodology/3/.

Step 1: Regulatory Surplus

There are no laws and regulations, related to cookstove distribution, applicable in the host country Angola. The assessment team has searched the publicly available information and also the applicable policies directly from the government of Angola. This has also been validated during the remote site audit/11/ where the PP, manufacturers, distributors, and beneficiaries were interviewed, where they confirmed that their participation was voluntary.

Step 2: Positive List

Section 3.5 of the VCS PD/1.2/ correctly demonstrates that it meets all of the applicability conditions of the applied methodology/3/ as well as the below conditions. In doing so, the project is deemed as complying with the positive list.

The project installs or distributes ICS at zero cost to the end-user and has no other source of revenue other than the sale of GHG credits. This was verified during the remote site interviews/11/ conducted with the beneficiaries by the validation team.

Step 3: Project Method

VVB determined and confirmed through the remote interviews/11/ that the ICS is installed at zero cost to the households and the project’s only source of revenue is the sale of GHG credits.

As the stoves are provided at zero cost to the end-users and has no other source of revenues other than the sale of the GHG credits, the project activity has not applied the investment analysis method set out in the CDM Tool for the Demonstration and Assessment of Additionality included in AMS-II.G to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible.

Conclusion: The project is considered additional because it satisfies the positive list criteria of the applied methodology/3/ (VMR0006 version 1.1) for the demonstration of additionality.

3.3.6 Quantification of GHG Emission Reductions and Removals

Baseline Emissions:

The applied methodology/3/ does not account for baseline emissions separately, but instead quantifies emission reductions as a function of the reduction in the amount of non- renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves.

Project Emissions:

The applied methodology does not account for baseline emissions separately, but instead quantifies emission reductions as a function of the reduction in the amount of non- renewable biomass fuel consumption in the efficient project stoves as compared to baseline stoves.

Leakage Emissions:

Leakage shall be considered as default 0.95 in accordance with the applied methodology.

Net GHG Emission Reductions from the project activity:

$$ER_{y,i,j} = B_{y,savings,i,j} \times f_{NRB} \times NCV_{wood\ fuel} \times (EF_{wf,CO_2} + EF_{wf,non-CO_2}) \times N_{y,i,j} \times 0.95$$

Where:

$B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y

f_{NRB} = Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB})

$NCV_{wood\ fuel}$ = Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)

EF_{wf,CO_2} = CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO₂/TJ)

$EF_{wf,non-CO_2}$ = Non-CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO₂/TJ)

$N_{y,i,j}$ = Number of improved cookstoves of type i and batch j operating during year y

0.95 = Discount factor to account for leakage

The quantify of woody biomass saved due to implementation of improved cookstoves to be estimated using equation below:

$$B_{y,savings,i,j} = B_{y=1,new,i,survey} \times \left(\frac{\eta_{new,y,i,j}}{\eta_{old}} - 1 \right)$$

Where:

$B_{y=1,new,i,survey}$ = Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey

$\eta_{new,y,i,j}$ = Efficiency of the improved cookstove type i and batch j determined through water boiling test (WBT) during year y Alternatively, efficiency may be determined using Equation given below

η_{old} = Efficiency of baseline cookstove

$$\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$$

Where:

η_p = Efficiency of project stove (fraction) at the start of project activity

$(DF_n)^{y-1}$ = Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered

0.94 = Adjustment factor to account for uncertainty related to project cookstove efficiency test

Assumptions applied for ex-ante calculation purpose:

1. The project will install 500,000 ICS through 4 batches, with each batch consisting of 125,000 ICS per year.
2. The life span of ICS is 10 years; thus, the operational lifetime of each batch is taken as 10 years.
3. Annual stove loss rate is estimated at 5%. This is assumed as conservative as compared with survey results. This value will vary during actual verification based on survey results.
4. $B_{y=1,new,i,survey}$ is considered as 1.29 tonnes/device/year. This has been derived from the monitoring survey conducted during the first year of project implementation/25/.

Hence, based on the above assumptions and calculation approach, the project activity is estimated to reduce 13,827,457 tCO_{2e} for a period of 10 years, with an annual average as 1,382,745 tCO_{2e}.

Thus, the validation team confirms that the project activity complies with the specified requirements and formulae used to determine emission reductions as discussed above. The assessment team also confirms that:

- All assumptions and data used by the PP are listed in the VCS PD, including their references and sources;
- All documentation used by the PP as the basis for assumptions and source of data is correctly quoted and interpreted in the VCS PD;
- All values used in the VCS PD are considered reasonable in the context of the proposed project activity;
- The baseline methodology has been applied correctly to calculate baseline emission, whereas justification for project emissions, leakage emissions, etc., are provided correctly and ex-ante emission reductions are demonstrated.
- All estimates of the ex-ante proposed baseline emissions can be replicated using the parameters and proposed values provided in the VCS PD.

3.3.7 Methodology Deviations

No methodology deviations have been identified.

3.3.8 Monitoring Plan

The project's monitoring plan is in compliance with the applied methodology, VMR0006, Version 1.1/3/. The monitoring plan will give an opportunity for real measurement of emission reductions achieved. The monitoring plan for the same has been included in section 5 of the VCS PD/1.2/. Validation team confirms that the project proponent is able to implement the monitoring plan.

Data and parameters fixed ex-ante

Parameter	Description	Value	Assessment
f _{NRB,y}	Fraction of woody biomass saved by the project activity	0.72	The fraction of woody biomass saved is calculated by C4 Eco solutions in line with applicable methodological CDM Tool

	during year y that can be established as non-renewable biomass		30, version 3.0/13/. The value has been consistently reported in the VCS PD.
$NCV_{wood\ fuel}$	Net calorific value of the non-renewable woody biomass that is substituted or reduced	0.0156 TJ/tonne	As per the applied methodology/3/, the net calorific value of non-renewable woody biomass that is substituted or reduced, is taken as the IPCC default for wood fuel.
EF_{wf,CO_2}	CO ₂ emission factor for the use of wood fuel in baseline scenario	112 tCO ₂ /TJ	The value taken for CO ₂ emission factor for the use of wood is a Default value from 2006 IPCC guidelines. The value has been consistently reported in the VCS PD.
$EF_{wf,non-CO_2}$	Non-CO ₂ emission factor for the use of wood fuel in baseline scenario	26.23 tCO ₂ /TJ	The value used for non-CO ₂ emission factor for the use of wood fuel is taken from 2006 IPCC Guidelines. The value has been consistently reported in the VCS PD.
η_{old}	Efficiency of baseline cookstove	0.1	The value for efficiency of baseline cookstove is taken from default methodology and is consistently reported in the VCS PD.

η_p	Efficiency of project stove at the start of project activity	0.345	The value for this parameter is taken from the manufacturer's specification/ Thermal Efficiency Test Report/17/ and is consistently reported in the VCS PD.
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Data and parameters to be monitored

Parameter and Unit	Description	Monitoring Frequency	Assessment
$N_{y,i,j}$ (Number)	Number of project devices of type i and batch j operating during year y	Atleast once every two years	The parameter will be verified using the stove distribution record and the monitoring survey records as verified during the remote audit/11/. This will be measured directly or will be based on a representative sample.
$\eta_{new,y,i,j}$ (Fraction)	Efficiency of the improved cookstove type i and batch j determined through water boiling test	Annually	The Efficiency of cookstoves is defined as per the vintage year of operation as defined in the applied methodology.

	(WBT) during year y		The value for the first year is considered based on the manufacturer's specification. Thereafter, the efficiency of the improved cookstoves, considering the estimation of loss in efficiency per year, will be calculated using equation 5 of the applied methodology.
$B_{y=1,new,i,j,survey}$	Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey	Determined in the first year of project implementation	In accordance with the applied methodology, the parameter is determined during the first verification and fixed for the remaining crediting period. This was confirmed during the remote audit.
Life Span	The operating lifetime of the	Once at the time of project	The value used has been

	project device.	stove installation	verified from the manufacturing specifications/ ¹ 7/ of the improved cookstoves.
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All documentation and records must be retained safely and easily accessible for at least two years after the project crediting period ends, in line with section 3.23.1 of the VCS Standard (v.4.3)/06/. The validation team accepts the data collection and administration techniques described in section 5.3 of the VCS PD/1.2/. The validation team spoke with PP representatives, and it was determined that PP creates and maintains a database of all the project equipment it delivered. Additionally, samples of equipment invoices were examined, and it was discovered that they contained data that complied with the monitoring standards of the methodology VMR0006 v.1.1/03/.

According to the validation team, the monitoring plan's implementation tools, such as data management, monitoring tools, and quality assurance and quality control procedures, are adequate to ensure that the emission reductions achieved by or resulting from the grouped project proposal therein can be reported ex-post and verified. The sampling plan also complies with the monitoring methodology VMR0006 (v.1.1)/03/, the Standard of Sampling and Surveys of CDM Project Activities and Programme of Activities (v.09.0)/04/, and the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (v.04)/05/.

The validation team certifies that the overall monitoring plan complies with the methodology VMR0006 (v.1.1)/06/ requirements, that the monitoring arrangements described in the monitoring plan/1.2/ are practical within the project design, and that the project proponents will be able to carry out the described monitoring plan/1.2/.

Grievance Mechanism:

The grievance mechanism was assessed using the Grievance Redress Policy and Procedure/23/ and was verified using end-user interviews during the remote audit/11/. According to this policy, the affected person may first discuss with Field Coordinator any issues they may be experiencing. The Field Coordinator will try to resolve the problem via informal discussion with the affected person. If in case, this does not work out, a formal procedure will may be used. Thereby implying that the project staff plays the major role in resolving complaints as they have been trained by the CQC staff on ways to resolve any issue.

The formal procedure requires that the grievance be in written form filled out by the grievant through an official form.

3.4 Non-Permanence Risk Analysis

The project activity does not require a non-permanence risk analysis. Hence this is not applicable.

4 VALIDATION CONCLUSION

C-Quest Capital SG Angola Stoves Private Limited has contracted Earthood Services Private Limited (ESPL) to validate the project 'Installation of high efficiency wood burning cookstoves in Angola- Project 2' (VCS ID - 2981) with regards to VCS Standard Version 4.3 requirements and the information provided by the Project Proponent related to the project design, operation, monitoring and reporting.

A risk-based approach has been followed to perform this validation. In the course of the validation 03 Corrective Action Requests (CARs), 09 Clarification requests (CLs) were raised and successfully closed.

Validation Conclusion:

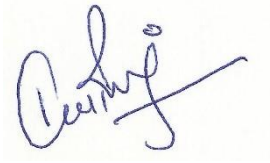
ESPL has reviewed the project description documents and subsequently carried out interviews to confirm the fulfilment of stated criteria.

The project activity is about distribution and installation of high efficiency wood burning TLC stoves for household cooking purpose in Angola. These high efficiency TLC-CQC Rocket Stoves (ICS) replace the existing inefficient, conventional open fire stoves, and will burn fuelwood more efficiently as compared to the baseline stoves, thereby saving the amount of wood burnt in cooking purpose and emissions associated with it. The project activity also reduces deforestation in host country and minimises the health risks associated with indoor smoke pollution.

As summary the validation team is able to conclude that:

- The project is in line with all relevant host country criteria (Angola) and all relevant VCS version 4.2 program guidelines requirements.
- The project additionality is sufficiently justified in the VCS PD.
- The monitoring plan is transparent and adequate and in line with applied baseline and monitoring methodology of VMR006, version 1.1.
- The calculation of the emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,382,7458 tCO₂e/year is most likely to be achieved within the 10 years crediting period.

The conclusions of this report show that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation as outlined under VCS Standard version 4.3.



Dr. Kaviraj Singh

Managing Director

Earthood Services Private Limited

Date: 28/02/2023

Place: Gurugram

APPENDIX 1: DOCUMENT REFERENCE

S. No.	Title of Document	Version	Date
1.1	Initial Project Description submitted for Validation	1.0	09/02/2022
1.2	Final Project Description submitted for Validation	2.2	24/02/2023
2.1	Initial Emission Reduction Calculation Spreadsheet	1.0	24/11/2020
2.2	Final Emission Reduction Calculation Spreadsheet	2.2	24/02/2023
3	Applied baseline and monitoring methodology: VMR0006 "Methodology for Installation of High Efficiency Firewood Cookstoves"	1.1	-
4	Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities	9.0	-
5	Guidelines for sampling and surveys for CDM project activities and Programme of Activities	4.0	-
6	VCS Standard	4.3	-
7	VCS Program Guide	4.2	-
8	VCS Validation and Verification Manual	3.2	-
9	Registration and Issuance Process	4.2	-
10	VCS Program Definitions	4.2	-
11	Remote Audit	-	20/06/2022 to 21/06/2022
12	Declaration by PP regarding the ownership of the grouped project	-	-
13	Report for 'Calculation of the fraction of non-renewable biomass (f_{NRB})' by C4 EcoSolutions	-	01/02/2022
14.1	Proof of start date	-	01/09/2021
14.2	Sample end-user declaration	-	-

15	Rural Cookstove Training Manual for Sub-Saharan Africa	-	-
16	Results of Testing the TLC 15 Brick Rocket Stove (WBT)	-	October 2015
17	TLC Construction Brochure/ Manufacturer's Specification	-	-
18	Africa Covid-19 Cases https://ethealthworld.com/s/q5qwd6a	-	27/06/2022
19	Project Database	-	-
20	Raosoft Website Results http://www.raosoft.com/samplesize.html	-	-
21	FAO (fao.org) statistical data – Country reports Global Forest Resources Assessments 2010	-	-
22	Construction and Maintenance Brochure	-	-
23	C-Quest Capital Grievance Redress Policy & Procedure	-	-
24	Angola KML file	-	-
25	2981_Monitoring survey result_MP1	-	-

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
BEF	Baseline Emission Factor
CO ₂	Carbon dioxide
CDM	Clean Development Mechanism
CMS	Central Monitoring System
CL	Clarification Request
CMP	Conference of Parties Serving as Meeting of Parties
CAR	Corrective Action Request
EB	Executive Board
FAO	Food and Agriculture Organization of the United Nations
FAR	Forward Action Request
GHG	Green House Gas
ICS	Improved cookstoves
MP	Monitoring Period
MR	Monitoring Report
O&M	Operation and Maintenance
PAI	Project Activity Instance(s)
PD	Project Description
PP	Project Proponent
QA/QC	Quality Assurance and Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS PD	VCS Project Description
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCUs	Verified Carbon Units
VVB	Validation and Verification Body

APPENDIX 3: FINDINGS OVERVIEW

CL ID	01	Section no.	1.4	Date : 29/06/2022
Description of CL				
According to the Section 1.4 of VCS PD, a clarification is requested for: Point 5, Step 1, it is mentioned '<i>There is no mandated government programme or policy in host country of this project ensuring the distribution of new project activity instances</i>'. PP is requested to clarify what kind of regulations are being referred to here, and how to validate it?				
Project Proponent response				Date : 27/07/2022
To demonstrate additionality, the Project Proponent would like to state that each project activity instance demonstrates its compliance specifically under regulatory surplus as follows: There is no law, statute or government Programme or policy in Angola mandating the programme or policy in Angola mandating the project activity nor is there any systematically enforced law, statute or other regulatory framework for such projects. Project Proponent would like to clarify that a review is made on Angola environmental laws and regulations as stated below: a) Basic Environmental Law, No. 5/98 - to provide the basic principles of preserving and protecting the environment, of promoting quality of life and the rational use of natural resources, in accordance with Constitutional Law. b) General Regulation for Environmental Impact Assessment and the Environmental Licensing Procedure, Decree no.117/20 - to establish rules and procedures for the environmental impact assessment of public and private projects and the environmental licensing procedure for activities that are likely to cause significant environmental and social impact, as well as applicable fees and fines for noncompliance. - to revoke Environmental Impact Assessment Law, Decree No. 51/04 and Environmental Licensing Law, Decree No. 59/07. Same details have been mentioned in section 1.4 and 1.14 of the revised VCS PD 2.0. Hence, each project activity instance demonstrates its compliance with the regulatory surplus under additionality and meets the eligibility criteria for inclusion of new project activity instances.				
Documentation provided by project proponent				
VCS PD v2.0				

VVB assessment	Date: 09/08/2022
PP has clarified that two kinds of regulations should be referred to i.e., Basic Environmental Law and the General Regulation for Environmental Impact Assessment and the Environmental Licensing Procedure, Decree no. 117/20, to validate that there are no mandatory laws or govt policies related to ICS distribution. Hence, CL01 is closed.	

CL ID	02	Section no.	1.8 & 1.9	Date : 29/06/2022
Description of CL				
1. As per the requirement of para 3.7 of VCS standard, version 4.2, <i>"the project start date of a non-AFOLU project is the date on which the project begins generating GHG emission reductions or removals. Projects shall complete validation within specific timeframes from the project start date"</i>. Therefore, in section 1.8 of the Project Description, the start date and the evidence provided for the start date are found to be inconsistent. PP is requested to clarify. 2. Furthermore, in accordance with the requirement of 3.8.1 of VCS standard, version 4.2, <i>"the project crediting period shall be either seven years, twice renewable for a total of 21 years, or ten years fixed"</i>. 3. In section 1.9 of the PD, the crediting period is taken from 01/12/2021 which is the start date of the project activity and incorrect as per the evidence. Kindly revise as appropriate. 4. As per Section 1.9 of VCS PD, the crediting period is 01/12/2021 – 30/11/2031. Whereas, according to the VCS Registry, <i>the crediting period has yet to start, 02/09/2022 - 01/09/2032</i>. A clarification is requested for the same.				
Project Proponent response				Date : 27/07/2022
1.As per the VCS Program Definitions v4.2, the Project Start Date is the date on which the project began generating GHG emission reductions or removals; equal to "Project Crediting Period Start Date". Further, Crediting Period Start Date is the date on which the project began generating GHG emission reductions or removals; equal to "Project Start Date". In section 1.8 of the VCS PD v1.0, the project start date was estimated as 01-December-2021. However, the first cookstove under this grouped project was installed on 01-September-2021. The registration form for cookstove serial numbers CQCVAN0020960 and CQCVAN002096 along with the project start date, i.e., 01-September-2021 has been submitted to the VVB. 2.In line with the Project Start Date, the Project Crediting Period(fixed) has been revised as 01-September-2021 to 31-August-2031. Therefore, section 1.8 and section 1.9 has been updated in the revised VCS PD v2.0 being submitted to the VVB.				
Documentation provided by project proponent				

VCS PD v2.0	
VVB assessment	Date: 09/08/2022
1. PP has corrected the start date of the project activity in the revised VCS PD and is found acceptable. OK 2. The project crediting period has been revised in the VCS PD v2.0 and is found OK. Hence, CL02 is closed.	

CL ID	03	Section no.	1.9	Date : 29/06/2022
Description of CL				
As per the VCS standard v4.2, section 3.9 “ <i>Projects are categorized by size according to their estimated average annual GHG emission reductions or removals</i> ”. Information regarding the scale of the project activity lacks clarity in the PD.				
Project Proponent response				Date : 27/07/2022
Project Proponent would like to state that in line with the VCS Program Definitions v4.2, a project that generates 300,000 tonnes CO ₂ e or more of GHG emissions reductions or removals per year is categorized as “Large Project”. Therefore, as per the estimated emission reductions provided in the workbook and the revised VCS PD, the project scale is “Large Project”. Same has been mentioned in section 1.10 of the VCS PD.				
Documentation provided by project proponent				
VCS PD 2.0				
VVB assessment				Date: 09/08/2022
Information regarding the scale of the project activity has been updated in the revised VCS PD v2.0 and the justification is found acceptable. Hence, CL03 is closed.				

CAR ID	04	Section no.	1.11	Date : 29/06/2022
Description of CAR				
1. According to the template for VCS Project Description Version 4.1, ‘<i>Include in the description information about the age and average lifetime of the equipment based on manufacturer’s specifications and industry standards.</i>’ 2. According to the ‘TLC Construction Brochure’ submitted by the client to the VVB, a) Materials required: 15 clay bricks- ideal brick size is 22cm long by 11cm wide by 6.5cm high b) Mud Mortar is prepared by mixing 3 liters of anthill clay, 3 liters of sand and 3 liters manure with 3 liters of water c) The size of TLC Rocket Stove is 34.5 cm x 34.5 cm x 28 cm. The specifications provided is not in line with PD.				
Project Proponent response				Date : 27/07/2022

1. The average life of the Cookstove as per the manufacturer 's specification is 10 years. Same has been mentioned in VCS PD v2.0 and the manufacturing specification has been provided to the VVB as the supporting evidence. Information regarding the age of each project activity instance (i.e., each project cookstove) will be provided in the emission reduction calculation workbook during the verification of the project. 2. The specifications of the project stove- TLC Rocket stove have been revised under section 1.11 in the VCS PD v2.0.	
Documentation provided by project proponent	
<i>Manufacturer 's specification for TLC Rocket Stove</i>	
VVB assessment	Date: 09/08/2022
1. The description information about the age and average lifetime of the equipment has been updated in the revised VCS PD. OK 2. The specifications provided in the PD are now in line with the Manufacturer's specification for TLC Rocket Stove provided by the project proponent. OK	
Thus, CAR04 is closed.	

CL ID	05	Section no.	-	Date : 29/06/2022
Description of CL				
PP is requested to submit the following documents: 1. KML File for location 2. Manufacturer's specification 3. End user agreement				
Project Proponent response				Date : 27/07/2022
All the requested documents mentioned below have been provided to the VVB.				
Documentation provided by project proponent				
1. KML File for location 2. Manufacturer's specification 3. End user agreements				
VVB assessment				Date: 09/08/2022
KML file, Manufacturer's specification and end user agreements are submitted by the project proponent thereby confirming the project location, stove specifications and the declarations signed by beneficiaries stating that PP will be sole owner of carbon credits generated by this project activity. Hence, CL05 is closed.				

CAR ID	06	Section no.	Completeness of PD	Date : 29/06/2022
Description of CAR				
The submitted PD is of version 4.0. Project Proponent is requested to revise the PD as per the latest available applicable template.				

Project Proponent response	Date : 27/07/2022
The VCS PD has been revised to the latest version 4.1 of the template and is being submitted to VVB.	
Documentation provided by project proponent	
VCS PD 2.0	
VVB assessment	Date: 09/08/2022
The revised VCS PD v2.0 has been updated in accordance with the VCS Project Description Template v4.1. Hence, CAR06 is closed.	

CL ID	07	Section no.	2.4	Date : 29/06/2022
Description of CL				
According to registry, 'This project was open for public comment from 08/05/2022 to 07/06/2022. Any comments received have been uploaded in the "Other Documents" section below'. PP is requested to add any GSC comments received.				
Project Proponent response				Date : 27/07/2022
No comments were received during the public comment period. Same has been mentioned in section 2.4 of the revised VCS PD 2.0.				
Documentation provided by project proponent				
NA				
VVB assessment				Date: 09/08/2022
It can be verified that no negative comments were received for the project activity during the public commenting period. Thus, CL07 is closed.				

CL ID	08	Section no.	5.1	Date : 29/06/2022
Description of CL				
In section 5.1, the value applied for the parameter f_{NRBy} is taken as 0.93, whereas according to the report (evidence) submitted by the PP, the value is 0.73. The PP is requested to clarify the inconsistency and send the revised documents, if applicable.				
Project Proponent response				Date : 27/07/2022
The correct value for f_{NRBy} is estimated to be 0.72. Emission Reduction estimates have been revised using the f_{NRBy} value of 0.72. The report (dated 1 February 2022) prepared by C4 EcoSolutions (Pty) Ltd. detailing the calculation of f_{NRB} has been submitted to the VVB as the supporting evidence.				
Documentation provided by project proponent				
Emission Reduction Spreadsheet v2.0				
Report-Calculation of f_{NRB} value prepared by C4 EcoSolutions (Pty) Ltd (dated 1 February 2022).				

VVB assessment	Date: 09/08/2022
The value for f_{NRBy} is taken as 0.72 as per the report prepared by C4 Eco Solutions (Pty) Ltd for calculation of f_{NRBy}, and the emission reduction calculations have been revised accordingly. Hence, CL08 is closed.	

CL ID	09	Section no.	5.1	Date : 29/06/2022
Description of CL				
In section 5.1, for the parameter η_{old}, according to the project description document "A default value of 0.1 shall be used if baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney". PP shall clarify how the baseline device in the households is checked and recorded before distribution of the project device to them; and provide relevant evidence along with it.				
Project Proponent response				Date : 27/07/2022
Consent is provided by the end user in form of his/her signature in respective cookstove registration form regarding the baseline stove. The end user provides his consent that his/her household does not currently have an upgraded stove and is using the upgraded stove voluntarily to replace the "traditional 3 stone stove". <i>Sample signed cookstove registration forms where the above-mentioned clause is recorded have been provided to the VVB as the supporting evidence.</i>				
Documentation provided by project proponent				
<i>Copies of Sample cookstove registration forms signed by the end users.</i>				
VVB assessment				Date: 09/08/2022
It has been assessed by the sample cookstove registration forms signed by end-users stating that their household does not currently have an upgraded stove and is using the upgraded stove voluntarily to replace the traditional 3 stone stove. This clarifies how the baseline device in the households are checked and recorded before distribution of the project devices. This is found acceptable. Hence, CL09 is closed.				

CL ID	10	Section no.	5.1	Date : 29/06/2022
Description of CL				
In section 5.1, for the parameter $B_{y=1,new,i,j,survey}$, according to applied methodology- "For projects opting for $B_{y=1,new,i,j,survey}$, it shall be demonstrated that the consumption of biomass for individual project stoves can be measured exclusive of one another" in case one household has more than 1 ICS installed. PP is requested to clarify how the methodology conditions are met.				
Project Proponent response				Date : 27/07/2022

Project proponent would like to clarify as per the section 9.2 of the applied methodology - VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1¹ - monitoring survey will be carried out to determine the value of annual quantity of woody biomass, i.e., $B_{y=1,new,i,j,survey}$ used by each project stove.

For monitoring $B_{y=1,new,i,j,survey}$ the data collected will be representative number of stoves based on simple random sampling in the database. This database will comprise the projects stoves that were distributed within one year of start date of project implementation. The method of collecting data will be field survey and frequency will be once during the entire crediting period.

As part of the monitoring survey, the surveyors will be using the weighing scale to measure the wood consumption in each project stove. The observations will be further recorded in the monitoring survey and will be provided to the VVB during the verification of the instances under the grouped project.

Details regarding the monitoring of the parameter " $B_{y=1,new,i,j,survey}$ " in line with the requirement of the applied methodology has been mentioned in section 5.1 of the revised VCS PD. Details regarding the field measurements undertaken in monitoring plan have been mentioned in section 5.3 of the revised VCS PD.

Documentation provided by project proponent

NA

VVB assessment

Date: 09/08/2022

The justification provided by PP is found acceptable. Hence, CL10 is closed.

CL ID	11	Section no.	-	Date	: 29/06/2022
Description of CL					
The PP has provided information on the distribution of the ICS. However, no information is provided in the monitoring system to indicate the organizational structure, roles, and responsibilities of personnel involved in the data monitoring, as well as any procedures for replacement/repair of damaged project devices.					
Project Proponent response					Date : 27/07/2022

¹ <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

Project Proponent would like to state that section 5.3- Monitoring Plan in the revised VCS PD comprises the flow chart -Figure 1 which illustrates the roles and responsibilities of the stakeholders which are involved in the step -wise implementation of the monitoring plan. Details regarding the same have been further mentioned in the revised VCS PD.

Further, details regarding the grievance redressal mechanism have been mentioned in section 2.2 of the revised VCS PD. Document detailing the Feedback and Grievance Redress Policy has also been provided to the VVB as the supporting evidence.

Documentation provided by project proponent

Grievance Redress Policy

VVB assessment

Date: 09/08/2022

PP has updated the revised VCS PD with information on the organization structure and the grievance mechanism. This information is justified and is found acceptable. Hence, CL11 is closed.

CAR ID	12	Section no.	Completeness of PD	Date : 29/06/2022
Description of CAR				
The following inconsistencies were observed in the VCS PD: 1. According to the template, Section 1.17 – Sustainable Development Contributions and 1.18 – Additional Information Relevant to the Project. 2. According to Section 3.2, Point 5 of Application of Methodology, PP is requested to specify the entire condition in the column '<i>Applicability Criterion</i>'. 3. In Section 4.4, the equation: $N_{(y,i,j)} = 105,000 \times [1 - (2-1) \times 10\%]$, here the value of cookstoves is incorrectly mentioned. 4. In Section 5.1, for the parameter <i>Date of commissioning of batch j</i>, PP is requested to update the row for value Applied. 5. In Section 5.3, under Sampling Design, i. The latest version of <i>Standard for Sampling and Surveys for CDM Project Activities</i> is 9.0. Kindly revise the inconsistency. ii. A detailed explanation of the database administered by the PP, is not found in Section 1.11 of the VCS PD. PP is requested to revise the inconsistencies observed.				
Project Proponent response				Date : 27/07/2022

1. Section 1.17 – Sustainable Development Contributions and 1.18 – Additional Information Relevant to the Project have been revised in latest VCS PD submitted to the VVB. 2. Complete condition no. 5 as mentioned in the section 4 of the applied methodology VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1² has been mentioned in section 3.2 of the revised VCS PD submitted to the VVB. 3. Equation for determination of number of project stoves operating during year y has been corrected revised VCS PD submitted to the VVB. 4. The parameter <i>Date of commissioning of batch j</i> is not required to be mentioned under section 5.1 of the VCS PD as per the section 9 of the applied methodology VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1. 5. The version for <i>Standard for Sampling and Surveys for CDM Project Activities 9.0</i> is now consistent in the revised submitted to the VVB. 6. Details regarding the project database administered by the project proponent have been mentioned in section 1.11 of the revised VCS PD. Further details regarding the database will be provided during the verification stage of the instances under this grouped project.	
Documentation provided by project proponent	
NA	
VVB assessment	Date: 09/08/2022
PP has revised all the above-mentioned inconsistencies in the revised VCS PD v2.0. Hence, CAR12 is closed.	

Table 4. FAR from this validation

FAR ID	00	Section No.	NA	Date : DD/MM/YYYY
Description of FAR				
NA				
Project proponent response				Date : 27/07/2022
NA				
Documentation provided by project proponent				
NA				
VVB assessment				Date: DD/MM/YYYY

² <https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/>

APPENDIX 4: COMPETENCE STATEMENTS

Competence Statement			
Name	N Premjit Singh		
Education	B.Tech (Mechanical Engineering)		
	M.Tech (Energy Technology		
	PhD (Mechanical Engineering)		
Experience	9+ Years		
Field	Climate Change, Energy		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS I.D, ACM0002		
Local expert	YES		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (TA 1.2, 3.1)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	26/07/2022
Approved by	Deepika Mahala (Technical Manager)	Date	26/07/2022

Competence Statement	
Name	Shifali Guleria
Education	M.Sc. (Environmental Studies and Resource Management), TERI University
Experience	3+ year
Field	Climate Change

Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (AMS-I.A., AMS-II.G., AMS-II.E., AMS-III.A.V., AMS-I.D, ACM0002)		
Local expert	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (1.2, 3.1)		
Reviewed by	Deepika Mahala	Date	16/02/2022
Approved by	Ashok Gautam	Date	18/02/2022

Competence Statement	
Name	David Kaninda Kabengele
Education	Diploma in Technical Engineer in Civil Aviation
Experience	6 years
Field	Network and security systems
Approved Roles	
Team Leader	NO
Validator	NO
Verifier	NO
Methodology Expert	NO
Local expert	YES (Angola)
Financial Expert	NO
Technical Reviewer	NO
TA Expert (X.X)	NO

Reviewed by	Shifali Guleria (Quality Manager)	Date	16/06/2022
Approved by	Deepika Mahala (Technical Manager)	Date	17/06/2022

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	9 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., AMS.III.BL, ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Shifali Guleria	Date	26/04/2022
Approved by	Deepika Mahala	Date	26/04/2022

Competence Statement	
Name	Arohi Jain
Education	M. Sc. Environmental Sciences

	B.Sc. Biology		
Experience	2 years		
Field	Environmental Sciences		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	YES		
Reviewed by	Shifali Guleria, Quality Manager	Date	10/05/2022
Approved by	Deepika Mahala, Technical Manager	Date	10/05/2022