PURO.EARTH

OUTPUT AUDIT REPORT

KEY PROJECT INFORMATION	
REPORT ID	PUR.VER.25.011
REPORT TITLE	Namibia Sahvanna Restoration Biochar Project with Planboo Output Audit Report
REPORT DATE	25/03/2025
VERSION NO.	1.2
CO_2 REMOVAL SUPPLIER	Planboo ECO AB
PRODUCTION FACILITY NAME	Farm Gai Kaisa 159
PRODUCTION FACILITY ADDRESSES	D2512, Grootfontein District, Namibia
PRODUCTION FACILITY ID	226049
PRODUCTION FACILITY COORDINATES	19°54'01.1"S 17°50'00.3"E
REMOVAL PERIOD	21/02/2024 to 24/01/2025
CO_2 SINK SECTOR	Biochar
APPLIED METHODOLOGY	Biochar Methodology Edition 2022, v3.0
PURO.EARTH STANDARD VERSION	Puro Standard General Rules Version 3.1
NET VOLUME OF CO_2 REMOVAL	14292 CORCs
CLIENT	Puro. earth
PREPARED BY	Earthood Services Limited (formerly known as Earthood Services Private Limited)
APPROVED BY	 Dr. Kaviraj Singh CEO
WORK CARRIED OUT BY	Team Leader & Methodology Expert: Vardhan Kaushik Validator/Verifier: Mohd Aamir Khan Technical Reviewer & Methodology Expert: Deepika Mahala

Earthood

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1. INTRODUCTION

Earthood Services Limited (here in referred to as Earthood) was contracted by Puro. earth to undertake an output facility audit for the project facility "Farm Gai Kaisa 159" to verify the CO_2 removal claims for the period spanning from 21/02/2024 to 24/01/2025/1/. This report summarizes the results and conclusions of the output audit performed as a formal part of the Puro. Earth certification process as defined in Puro Standard General Rules version 3.1/5/. Earthood declares that we are an impartial auditor, free from any conflicts of interest, capable, and qualified to complete this audit according to Puro Standard General Rules/5/ and related Validation and Verification Body Requirements version 1.1/6/.

The Planboo Namibia biochar project is a collaborative initiative between Planboo EcoAB and Carbon Capital. Located in the Grootfontein District of central-northern Namibia, the biochar production facility utilizes biomass from Namibian encroacher species, which are invasive and provide sustainable feedstock for the project/14/. The facility employs pyrolysis technology and consists of three charcoal retort kilns operating continuously, with a production capacity of 15 tons of charcoal per day.

The Charcoal produced by the facility is screened and graded into restaurant grade, BBQ grade and charcoal fines which are about 30% of the total production per month amounts to an estimated 150t of charcoal fines per month/13/. Namibia is a leading charcoal producer in this region, it is a common practice to briquette these charcoal fines and burn as charcoal or discarded in the open, creating environmental hazards fuel. Under the CDR project these fines classified as biochar are applied to the agriculture land thereby generating carbon removal credits.

1.1 OBJECTIVES

The objective of this audit is to conduct a third-party assessment of the operational and administrative processes of the production facility, as well as the output generated and CO_2 removals achieved during the period from 21/02/2024, to 24/01/2025. The assessment verifies compliance of all project documentation and supporting materials with the rules and requirements of the Puro Standard General Rules Version 3.1/5/. In particular,

- Project conformance to the applied biochar methodology Edition 2022 v3.0/4/.
- Life Cycle Assessment (LCA) Report/2/ and CORC calculation/1/
- Uncertainty and Reversal risk estimation
- Monitoring and Reporting Plan
- Project Description

As directed by Puro.earth, the existing projects need to start following the new versions of the Puro Standard General Rules from the renewal of crediting period i.e. next production facility audit (every 5 years), unless the facility opt to do so earlier. The current project got registered in compliance with the Puro Standard General Rules version 3.1/5/ and is under output audit for second monitoring period (21/02/2024 – 24/01/2025) of the first crediting period (30/01/2024 – 29/01/2029)/1/. Therefore, the ongoing CORC issuance has been granted to Farm Gai Kaisa 159 as per the Puro Standard General Rules version 3.1/5/.

1.2 LEVEL OF ASSURANCE

☒ Reasonable Level of assurance

☐ Limited Level of assurance

Earthood's verification approach is based on understanding the risks associated with reporting GHG emissions data and the controls in place to mitigate these risks. Earthood's plan for the verification process involved obtaining the necessary evidence, information, and explanations to provide a reasonable level of assurance. The VVB reviewed sufficient evidence to verify the project implementation, data, parameters, and emission reduction calculations for this monitoring period. All the supportive documents and evidence referred during current output audit are included in Appendix 2. Any discrepancies found during the verification assessment were raised as audit findings and successfully resolved. All audit findings are included in Appendix 3 of this report.

During the current output audit, the VVB conducted a remote site audit of the project activity, as detailed in Section 2, and observed no substantial changes, thus meeting a reasonable level of assurance.

1.3 AUDIT TEAM

The audit involved a desk review of the relevant documentation, remote site audit, and technical review. The personnel employed and their roles in this assessment were as follows. The assessment team's qualifications are attached as Appendix 4.

Roles allocated to the assessment team						
Role	Name	Nature of involvement				
		Desk Review	Remote Site Audit	Reporting	Supervision	Technical Review

Team Leader & Methodology Expert	Vardhan Kaushik	Y	Y	Y	Y	-
Validator/Verifier	Mohd Aamir Khan	Y	Y	Y	Y	
Technical Reviewer& Methodology Expert	Deepika Mahala	-	-	-	-	Y

2 AUDIT PROCESS

A planned series of audit activities were conducted during the remote site audit/12/ to independently verify facility operations, production, and output data, and CORC Claims. The remote site audit was conducted following the specifications of Puro Standard General Rules Version 3.1/5/, the Puro Biochar Methodology Edition 2022 version 3/4/. Specific audit activities conducted are summarized below.

1. **Opening meeting**:
    a. Conducted an initial meeting to outline the audit objectives, scope, and methodology.
    b. Reviewed key operational measurement points and instrumentation used in the facility.
    c. Review of ownership details, roles and responsibilities of the removal suppliers.
2. **System Inputs and Outputs Review:**
    a. Examined the inputs (biomass feedstock) and outputs (charcoal and biochar fines) of the production system.
    b. Verified the accuracy and consistency of input and output data.
3. **Records Examination**:
    a. Inspected records related to the receipt of feedstock, including delivery notes and inventory logs.
    b. Reviewed production logs detailing the daily operation of the kilns and production outputs.
    c. Assessed the utilization and maintenance records of the equipment used in production.
4. **Data Collection and Material Handling Procedures:**
    a. Evaluated data collection methods and tools to ensure accurate tracking of production metrics.
    b. Observed material handling procedures to ensure compliance with operational standards and efficiency.
5. **Equipment and Calibration Review:**

a. Checked the calibration records/11/ for all measurement instruments and equipment used in the production process.
b. Ensured that all equipment was properly maintained and functioning correctly.

6. **Safety and Social Security Arrangements:**
   a. Assessed the safety measures in place at the production facility, including worker safety protocols and emergency procedures.
   b. Reviewed social security arrangements for employees to ensure compliance with local regulations and standards.
7. **Compliance Checklist:**
   a. Used the Puro Biochar Methodology Compliance Checklist to systematically verify adherence to the specified standards.
   b. Documented findings and ensured all criteria were met, with any discrepancies noted and addressed.
8. **CORC Claims Verification:**
   a. Independently verified the facility's CO_2 Removal Certificates (CORCs) claims.
   b. Cross-checked CORC claims against the production and output data to ensure accuracy and legitimacy.

These activities collectively ensured a comprehensive audit of the charcoal production plant, validating its operations, data integrity, and compliance with the Puro Biochar Methodology version 3.0/4/.

List of facility personnel interviewed during remote site audit is as follows.

S. No	Interviewee			Date	Team member(s)
	Last Name	First Name	Affiliation		
1.	Lindeque	Colin	MD- Carbon Capital Pvt. Ltd.	12-March-2025	Vardhan Kaushik and Mohd Aamir Khan
2.	Hernandez Folguera	Marc	CTO & Co-Founder - Planboo	12-March-2025	Vardhan Kaushik and Mohd Aamir Khan
3.	Falk	Stefan	CEO – Retort Charcoal Producers Pvt. Ltd.	12-March-2025	Vardhan Kaushik and Mohd Aamir Khan
4.	Schoonbee	Pieter-Jan	Site Personnel	12-March-2025	Vardhan Kaushik and Mohd Aamir Khan

3 COMPLIANCE WITH METHODOLOGY

There are no deviations to applied methodology observed during current monitoring period and project activity complies with the registered PPD and the requirements outlined in the applied methodology Puro Biochar Methodology Edition 2022 version 3/4/.

4 RESOLUTION OF FINDINGS

The process for raising the findings (corrective actions, non-conformities, or other findings) by the assessment team was carried out during the desk review phase and from the remote site audit observations and discussions. As an outcome of the audit process, the assessment team can raise different types of findings according to the following understanding:

1. A clarification request (CL) is raised where information is insufficient or not clear enough to determine whether the applicable requirements of the registry have been met.
2. When a non-conformance arises, the team leader raises a Corrective Action Request (CAR). CAR is issued, where:
    a. The project participant made mistakes that would influence the ability of the project activity to achieve real, measurable, and additional emissions reduction.
    b. The standard and methodology requirements have not been met; there is a risk that emissions reductions cannot be monitored or calculated.
    c. The auditing process may be halted until this information is made available to the team leader's satisfaction. Information or clarification provided as a result of CL may also lead to CAR.
3. A Forward Action Request (FAR) will be raised when certain issues related to project implementation are reviewed during the following validation assessment.

During the Output Audit, a total of 05 CLs and 02 CARs were raised and resolved satisfactorily. The list of CARs/CLs raised, and the responses provided, means of verification, reasons for their closure, and corrections in the relevant documents are provided in Appendix 3 of this report. No FAR was raised during this assessment.

5 PRODUCTION STANDING DATA

GENERAL INFORMATION	
Production Facility Name	Farm Gai Kaisa 159 GSRN: 643002406801000992
Facility unique Identity	559332-1291

Facility ID	226049
CO_2 Removal Supplier registering the production facility	86XEBDA43Z- Planboo Eco AB
Location	D2512, Grootfontein District, Namibia
Verified CORC Factor	2.06 CORCs per ton biochar
Verified CORCs for the reporting period from 21/02/2024 to 24/01/2025	14292-ton CO_2 eq CORCS
Removal Methodology for which the plant is eligible to receive CORCs	Biochar Methodology Edition 2022 V3
Production facility has benefitted from public funding	No
Removal method specific information as may be specified in the relevant removal method methodology	Biochar, Pyrolysis Process

6 QUANTIFICATION OF CO_2 REMOVAL

INPUT	VERIFIED RATE	UNIT	NOTES (Specifications, source, etc)
Biomass supply inputs (collection, handling, transportation emissions), ($E_{biomass}$)	572.27	tonne CO_2-eq	Emissions are from transport of biomass from source to kiln site. Verified average transport distance is within 35 km, from the suppliers' agreements. Growth and harvesting emission are considered 0 t CO_2 as the biomass is an invasive species and is harvested by hand, as verified from the LCA report. Since, there were no significant changes in the biomass source and harvesting procedures from MP1, the factor for $E_{biomass}$ obtained through LCA analyses was same as that of MP1/2/3/.
Production and operation emissions output ($E_{production}$)	901.00	tonne CO_2-eq	Production emissions include all the material and energy inputs (electricity, heat, water, packaging, other chemical), as well as infrastructure related emissions. During the remote site audit, it was observed that the cooling boxes are used for biochar cooling thus, the production water usage negligible.

			Calculations are based on the flue gas emissions analysis conducted by Ithaka Institute in 2023/17/. In current output audit, the production facility has installed Photovoltaic system replacing diesel generator for in house electricity consumption confirmed during remote site audit/12/, which significantly reduced the emissions from production facility as calculated in LCA analyses sheets/2/ and reported in CORC Report Summary sheet/1/.
Product distribution emissions output (E_{use})	18.83	tonne CO_2-eq	Biochar deliveries to end use cover transport emissions as well as soil incorporation emissions. The activity data is based on data collected each day based on the vehicles used. Verified through the biochar tracking and fuel log. The location for biochar application in the current output audit has been changed and is applied within the facility premises as confirmed during remote site audit/12/ and through Statement of End Use – Biochar – RCP/18/. This has resulted in significant reduction in diesel consumption for biochar application, thereby resulting into lesser E_{use} emissions as calculated in LCA analyses sheets/2/ and reported in CORC Report summary sheet/1/.
E_{stored}	-15784.56	tonne CO_2-eq	Dry mass is determined as per the facility protocols and verified by the lab analysis result.
Biochar used for which CORCs are claimed	6936.61	Dry metric tonnes	The geolocation of the farms is recorded in the database, along with images. Also, during the remote site audit it was verified that biochar was applied on the facilities own farm during the current removal period.
CORCs issued	14292		The value is correctly calculated based on the total production of biochar during the reporting period, and LCA calculation

Formula CORCS = $E_{stored} - E_{biomass} - E_{Production} - E_{use}$		
$E_{biomass}$	572.27/6936.61	0.08 tonne CO_2-eq/tonne biochar
$E_{production}$	901/6936.61	0.13 tonne CO_2-eq/tonne biochar
E_{use}	18.83/6936.61	0.0027 tonne CO_2-eq/tonne biochar
E_{stored}	-15784.56/6936.61	-2.28 tonne CO_2-eq/tonne biochar

CORC Factor	14292.46/6936.61	2.06 CORCs/tonne biochar
H:C ratio	0.36	

Comparison of CORCs Claimed and Verified CORCs			
Monitoring Period	**CORCs Claimed**	**Verified CORCs**	**VVB Assessment**
21/02/2024 – 24/01/2025	14305	14292	The CORCs claimed by CO_2 removal supplier under current monitoring period from 21/02/2024 to 24/01/2025 are 14305 CORCs, while the **total CORCs verified during output audit are 14292 CORCs.** The difference in claimed CORCs versus verified CORCs was observed due to minor misstatements pertaining to input data, which were resolved through audit findings, provided in Appendix 3.

7 FINAL OPINION

Based on our comprehensive review of the project documentation, thorough site inspection, and subsequent follow-up actions, Earthood Services Limited has gathered sufficient evidence to conclude that the production facility "Farm Gai Kaisa 159" meets the requirements outlined in the Puro Standard General Rules Version 3.1/5/. We confirm that the Puro Biochar Methodology Edition 2022 version 3/4/ has been correctly applied for output and CO_2 removal calculation.

The project implementation aligns closely with the information provided in the project documentation, and monitoring procedures adhere to the prescribed methodology. Furthermore, the removals achieved during the current monitoring period have been accurately calculated without significant discrepancies.

Our verification approach is grounded in a deep understanding of the risks associated with reporting GHG emission data and the implementation of controls to mitigate these risks effectively. Based on the evaluated information, we affirm that the verified emission removals for the second reporting period from 21/02/2024 to 24/01/2025, amount to 14292 CORCs.

Therefore, Earthood Services Limited confirms the production facility's capability to effectively remove CO_2 and requests the issuance of verified CORCs for the second reporting period.

APPENDIX 1: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
Earthood	Earthood Services Limited
CORC	CO_2 Removal Certificate
GHG	Greenhouse Gas(es)
PPD	Puro Project Description
VVB	Validation and Verification Body
LCA	Life Cycle Assessment
CDR	Carbon dioxide Removal

APPENDIX 2: REFERENCES

S.No.	Title	References to the document	Provider
1	CORC Report Summary - Complete_rev3	Dated 18/03/2025	Planboo
2	LCA Reporting sheets MP 2: • LCA Result reporting _ 2024-04-29 • LCA Result reporting _ 2024-07-04 • LCA Result reporting _ 2024-07-17 • LCA Result reporting _ 2024-08-26 • LCA Result reporting _ 2024-10-25 • LCA Result reporting _ 2024-11-20 • LCA Result reporting _ 2024-12-10 • LCA Result reporting _ 2025-01-27	-	Planboo
3	LCA Reporting Sheets MP1: • puro_LCA Result reporting _ 2023-12-11 (v3 - post application) • puro_LCA Result reporting _ 2024-04-29 (v4 - post application)	-	Planboo
4	Applied Methodology – Biochar Methodology	Version 3	Puro.earth
5	Puro Standard General Rules	Version 3.1	Puro.earth
6	Validation & Verification Requirements	Version 1.1	Puro.earth
7	Biochar and Fuel Tracking sheet	-	Planboo
8	Records of Biochar Used -Weigh Slips - Application Pictures	(04/04/2024 to 24/01/2025)	Planboo
9	Planboo_MRV_Farm_Gai_Kaisa manual	-	Planboo
10	Biochar Analysis Reports - Planboo_Carbon Capital_ Namibia_Lab results_240430 – Celignis - Planboo_Carbon Capital_ Namibia_Lab results_240430 - Celignis - 16 EPA PAH - Planboo_Carbon Capital_Biochar Environmental Quality Analysis_240220	-dated 30/04/2024 -dated 30/04/2024 -dated 20/02/2024	Planboo
11	Calibration Certificates - Weigh Bridge	-dated 15/05/2024	Planboo

	- Moisture Meter	-dated 21/05/2024	
12	Remote Site Audit Records	Dated 12/03/2025	-
13	Biochar Production Records	21/02/2024 to 24/01/2025	Planboo
14	FSC Confirmation Certificate for harvesting and Marketing of biomass	Dated -12/12/2023 -09/04/2024 -31/07/2024 - 01/11/2024	Planboo
15	Wood Supply Invoices	Dated -18/11/2024 -10/12/2024	Planboo
16	Environmental Clearance Certificate	Dated 29/06/2021	Planboo
17	Planboo_Flue gas_Emission_report_	Dated 21/07/2023	Planboo
18	Statement of End Use – Biochar - RCP	Dated 02/02/2024	Planboo

APPENDIX 3: AUDIT FINDINGS

Table 1. FAR from previous verification

FAR ID	NA	Section no.	NA	Date : DD/MM/YYYY
Description of FAR				
NA				
Project participant response				Date : DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	-	Date : 03/03/2025
Description of CL				
In reference to the worksheet "**Biochar batch records**" of "**CORC Report Summary-Complete.xlxs**", the weigh receipts pertaining to below mentioned dates (under Column L ,cells L27 to L712) are not provided with the evidence shared to VVB: i. 05/06/2024 ii. 18/07/2024 to 28/07/2024 Please provide weigh receipts corresponding to the above-mentioned dates.				
Project participant response				Date : 11/03/2025
Please find the weight slips here. Data downloaded from Planboo's MRV system.				
Documentation provided by project participant				
VVB assessment				Date: 17/03/2025
The weighbridge slips for the requested period have now been submitted and assessed by the VVB. This finding is closed. **CL 01 is closed.**				

CL ID	02	Section no.	-	Date : 03/03/2025
Description of CL				
Reference- worksheet "**Biochar batch records**" of "**CORC Report Summary-Complete.xlxs**" **Requirement:** As per para **5.3.6. of the Biochar Methodology version 3,** the CO_2 Removal Supplier must have a protocol in place to ensure both representative sampling (i.e. biochar sent for analysis is representative of the batch produced) and appropriate testing frequency (i.e. biochar is sent for analysis as often as needed to reflect variability and seasonality in biomass feedstock and production conditions) of the biochar produced. **Observation:** In reference to excel sheet titled "**CORC Report Summary-Complete.xlxs**", Worksheet-**Biochar batch records, Column F,** the Biochar analysis report dated 30/04/2024 (Planboo_Carbon Capital_ Namibia_Lab results_240430 - Celignis.pdf) has been quoted as reference for all the biochar batches (Batch ID 33 to 718) produced during previous and current monitoring period. The referred report could be a representative of Biochar batches with a production date on or before 30/04/2024. However, the same report has been quoted for Biochar batches produced after				

30/04/2024. For example, a lab analysis report dated 30/04/2024 has been quoted for biochar batches to be produced in future from the date of analysis (Batch ID-193 (production date- 19/07/2024) to Batch ID- 718 (production date- 21/01/2025).

In reference to file "**Planboo_Carbon Capital_Protocol for Biochar Sampling_240122**", the biochar sampling frequency defined for the current project activity is 24 hours reaching to a composite sample of 30 liters with an annual analysis frequency.

Action requested:

Please clarify how the Biochar analysis report dated 30/04/2024 is representative of all the biochar batches produced and used (from previous monitoring period) throughout the current monitoring period from 21/02/2024 to 24/01/2025.

Project participant response	**Date :** 11/03/2025

Using the *Planboo_Carbon Capital_ Namibia_Lab results_240430* report is correct until that same date the following year.

The biochar laboratory analysis is conducted annually as the section *"Laboratory Analysis and Quality Assurance"* states. The daily sampling is only so when the laboratory analysis is conducted we can take a representative analysis from all production done.

Documentation provided by project participant

VVB assessment	**Date:** 17/03/2025

It has now been clarified that the biochar analysis report is representative of the biochar produced within a year preceding to the test report date following the same input parameters. However, in the revised "CORC Report Summary-Complete_rev2" excel sheet (worksheet - Biochar batch records/column F), the biochar analysis report has been changed to *"Planboo_Carbon Capital_ Namibia_Lab results_230103.pdf",* which as per sampling protocol defines the validity up to 02/01/2024. The analysis report considered for biochar production batches represents the biochar produced post 02/01/2024 till end of the monitoring period which is 24/01/2025.

1. Please clarify the applicability of the biochar analysis report dated 03/01/2023 is representative of the biochar batches produced post 02/01/2024. **Open.**

   Please justify the biochar sampling and analysis complies with para 2.8 of the EBC Guidelines for a sustainable production of Biochar which states that *"**The sampling of a new batch following a production batch produced with the same parameters should be done within a year after the last sampling and analysis**. Sample taking should be finalized during the inspection visit."* **Open.**

2. The reporting period mentioned in the "CORC Report Summary-Complete_rev2" extends from **30/01/2024** to 24/01/2025, which covers the period **30/01/2024 – 20/02/2024 audited already with CORCs issued in the previous audit** and thus found inconsistent with the reporting period defined in the sheet "CORC Report Summary-Complete". Please review the revised CORC summary sheet and share across the updated file marked with revisions pertaining to first and second round of audit findings. **Open.**

CL02 remains open.

Project participant response	**Date :** 18/03/2025

1. This was a mistake; I had an older version of the "*CORC Report Summary-Complete*" than the submitted one and this one had the lab analysis we used for the pre-feasibility of the project. I have now corrected this to the document this finding was first mentioning (and the one we actually used for credit issuances, "*Planboo_Carbon Capital_ Namibia_Lab results_240430 - Celignis.pdf*") in the "CORC Report Summary-Complete_rev3"
2. Similar to the comment above, the older version of the CORC Report Summary included the already audited period (30/01/2024 – 20/02/2024). I have now removed it from the rev03 (link above).

Documentation provided by project participant
VVB assessment	**Date:** 18/03/2025
The assessment team confirms that the excel sheet "CORC Report Summary -Complete_rev3" has been revised which now mentions the correct biochar analysis report and reporting period. Closed. CL 02 is now closed.

CL ID	03	**Section no.**	-	**Date :** 03/03/2025
Description of CL				
In reference to Biochar analysis report title **"Planboo_Carbon Capital_ Namibia_Lab results_240430 – Celignis.pdf**", the following observations needs clarification: i. The standard used for Carbon, Hydrogen and Nitrogen estimation is "EN 15104:2011" has been withdrawn in 2015 and superseded by "EN ISO 16948:2015" endorsed by Technical Committee ISO/TC 238 "Solid biofuels" in collaboration with Technical Committee CEN/TC 335 "Solid biofuels" (CEN - European Committee for Standardization). Also, the testing methods defined in the file "**Planboo_Carbon Capital_Protocol for Biochar Sampling_240122"** shared during facility audit are: Testing Methods: ● Hydrogen: DIN 51732: 2014-07 ● Total Carbon: DIN 51732: 2014-07 ● Total Inorganic Carbon: DIN 51726: 2004-06 ● Total Organic Carbon: Calculated as Total Carbon minus Total Inorganic Carbon ● H/C_{org} / Ratio (molar): Calculated as Hydrogen / Total Organic Carbon * 12.011 / 1.00784 **Action requested:** Please clarify the estimation of carbon, hydrogen content of biochar using a withdrawn standard is valid. Also, clarify non-compliance with the monitoring/testing procedure defined under "**Planboo_Carbon Capital_Protocol for Biochar Sampling_240122"** during facility audit.				
Project participant response				**Date :** 11/03/2025
The standards for carbon and hydrogen content are set on the "Guidelines for a sustainable production of biochar" (pag 54 & 55). This guidelines is included in Puro's methodology as valid methods. Celignis confirmed they were testing according to EBC standards and this report was submitted and approved both by Earthood and Puro during the first facility and output audit. This was confirmed by them via email (see here) and stated on their website.				
Documentation provided by project participant				
VVB assessment				**Date:** 17/03/2025
Although, the methods for estimation of Carbon and Hydrogen outlined in the analysis report are overruled by the new standards, the experimental procedures used complies with the EBC standards as validated through the confirmation mail from Celignis and the "Planboo Biochar Environmental Quality Analysis Report". Thus, the biochar analysis is conducted as per the guidelines defined by EBC/WBC through a nationally accredited laboratory. Closed. CL03 is now closed.				

CL ID	04	Section no.	-	Date : 03/03/2025
Description of CL				
In reference to excel sheet **"Production Amounts.xlsx"**, the biochar production has been accounted for the all the months under current monitoring period from 21/02/2024 to 24/01/2025. However, in the excel sheet titled "**CORC Report Summary-Complete.xlxs/Worksheet-Biochar batch records",** the production records for the months of February 2024 to June 2024; August 2024 and September 2024 are not accounted. Please clarify the inconsistency.				
Project participant response				**Date :** 11/03/2025
We define a biochar batch as "*Each truck load of biochar that leaves the production site to be applied is defined as a batch. The dry matter of biochar in each truck load is measured following the biochar dry matter protocol established by Planboo"*. This has been approved by Puro (& Earthood) already. As this is the case; on column C of the "CORC Report Summary – Complete", as per recommendation of Elias Azzi (Science & LCA Advisor at Puro), we enter last date of production only. Between the June, August & September the applications production was done, but no truck did not leave the production site to be applied, hence the production was accumulated until the a truck left the production site. Again, this was the process recommended (and approved) by Puro.				
Documentation provided by project participant				
VVB assessment				**Date:** 17/03/2025
The biochar production logs, and end use has been demonstrated by Planboo during remote site audit. The biochar facility stores biochar within the facility prior to its application to the field. The date on which biochar is applied to the field and the respective quantity of biochar are considered for CORC estimation. Therefore, the justification provided by the client was deemed appropriate by the assessment team. Closed. CL 04 is now closed.				

CL ID	05	Section no.	TR Comments	Date : 19/03/2025
Description of CL				

In reference to **CORC Report Summary-Complete_rev3.xlsx** and **LCA Result Reporting** sheets, following observations have been identified as Technical Review findings:

1. **$E_{biomass}$:** Multiple new LCA analysis have been conducted for current MP. However, the factor for $E_{biomass}$ estimation derived from LCA analysis is exactly same as last MP (82.5). Please clarify.

2. **$E_{production}$:** Multiple new LCA analysis have been conducted for current MP.

    i. The new LCA has resulted in higher production emission factor (158.3) for month April to August 2024. Please explain the reason.

    ii. For months Sept 2024 onwards, the factor exactly same as last MP (109.4). Please explain.

3. **$E_{production}$:** $E_{biomass}$ values follows the same trend for the current MP as for the previous MP. However, for $E_{production}$, several abrupt values were observed (Please see graphs in Book1). Request you to clarify the reason.

4. **E_{use}:** Factor for E_{use} obtained from LCA for current MP is significantly low (1.9-9) kg CO_2-eq per batch as compared to the previous output verification (108.6kg CO_2-eq per batch). Please justify the reason for the change.

5. **E_{use}:** $E_{biomass}$ values follows the same trend for the current MP as for the previous MP. However, for E_{use}, several abrupt values were observed (Please see graphs in Book1). Request you to clarify the reason.

Project participant response	Date : 20/03/2025

1. The sourcing of biomass has not changed at all; so the **$E_{biomass}$** stayed the same. We submitted multiple LCAs because it was required to do per submission, but also some other aspects did change.

2. From September 2024; the site installed a PV system (removing the diesel generator) on site; which reduced production emissions (it is also stated on the "CORC Report Summary-Complete_rev3.xlsx" supporting documentation tab. As approved by Puro the embodied emissions from this are deemed de minimis

3. Due to the change on energy usage (generator first; PV after) the factor of Eproduction changes substantially; this has an effect to the trend (especially when this is sorted by lowest to highest Estored, rather than when in time this activities happened). Attached Book2.xlsx, which shows the Estore & Eproduction based on the actual timeline application. In there you can see that the ratio Estored to Eproduction stays the same until the Generator to PV system happens. You'll be able to see how the Ebiomass ratio stays consistent (0.028) across the whole timeline (as the emissions for it did not change).

4. The reduction on diesel usage from the initial LCA done is due to the fact that we initially had assumed the requirement of using ~23L of diesel per t of biochar (or 80L a day) to apply the biochar (as this one would travel to a different location). When the project started there was a change of plans (project owner decided to apply the biochar into a field next to site, with the aim to turn it into agricultural crop land). This reduced the required diesel to transport the biochar; improving the Factor for E_{use}

5. Similar to point 3; the Euse emissions where directly related to actual diesel used for land preparation, biochar transport & tilling, as some of this activities happened not directly related to how much biochar needed applying (land preparation need to happen ahead of the application and to keep costs down the project was doing more preparation than required at once to avoid having to bring the vehicles again). This ended up resulting on a variable Euse factor.

Documentation provided by project participant

VVB assessment	Date: 20/03/2025

1. It has been clarified that the biomass sourcing and harvesting procedures in the current monitoring period are same as those of first MP as evident from the FSC certifications acquired by the biochar production facility. Thereby, the $E_{biomass}$ factor derived from LCA analysis remains same for current MP. Closed.

2. The retort charcoal production facility replaced the diesel generator with PV system in September 2024, thereby reducing the emissions originating from production facility. Thus, it has been clarified that the $E_{production}$ factor was reduced to 109.4 after September 2024. Closed.

3. The $E_{production}$ values significantly changed post installation of PV system in the facility resulting in deviation to the $E_{production}$ vs E_{stored} trend observed during first MP. However, $E_{production}$ vs E_{stored} values plotted with respect to actual timeline of application provided a constant ratio of 0.014 and 0.021 across batches produced within facility with diesel and

PV system respectively. This clarifies that the $E_{production}$ and E_{stored} values were relative to the biomass processed and follows the trend across timeline. Hence, closed.

4. The biochar application location in the current MP has been changed which is around 500-600 meters from the production facility as confirmed through location file shared and remote site audit. The reduced distance resulted in less diesel consumption, thereby significantly reducing E_{use} values for the current MP. Hence, closed.

5. E_{use} emissions comprise of diesel consumption for various activities during biochar applications like land preparation, biochar transport, tilling etc. which are not directly related to quantity of biochar applied. The fuel log sheet has considered these activities while quantifying the total fuel consumption. Thus, the E_{use} emissions have variable values throughout the MP. The clarification provided is deemed appropriate by the VVB. Hence, closed.

CL05 is now closed.

Table 3.CAR from this verification

CAR ID	01	**Section no.**	-	**Date :** 03/03/2025

Description of CAR

Reference- CORC Report Summary-Complete.xlxs/Worksheet-Biochar batch records/Column-L

The following misstatements have been identified regarding the wet mass of batch on cross verifying with the weigh slips:

S. No.	Cell No.	Value Mentioned	Observation
i.	Cell L75	7.34 t	Incorrect value as per receipt no. 3608
ii.	Cell L148	9.79 t	Incorrect value as per receipt no. 3933
iii.	Cell L165	11.63 t	Incorrect value as per receipt no. 3991
iv.	Cell L171	8.23 t	Incorrect value as per receipt no. 4002
v.	Cell L439	14.09 t	Incorrect value as per receipt no. 4928
vi.	Cell M507	8/11/2024	Incorrect date as per receipt no. 5113
vii.	Cell L561	14.51 t	Incorrect value as per receipt no. 5226
viii.	Cell L612	11.35 t dated 17/11/2024	**The same receipt 5278 has been counted twice**

Please check and report the correct values as per the corresponding weigh receipts.

Project participant response	**Date :** 11/03/2025

I've updated the document. You can download the document here (*CORC Report Summary - Complete_rev2*)

Documentation provided by project participant

VVB assessment	**Date:** 17/03/2025

The identified misstatements in the "CORC Report SummaryComplete.xlxs/Worksheet-Biochar batch records/Column-L" have now been rectified in the revised "CORC Report Summary - Complete_rev2" sheet. Thus, finding is closed.

CAR 01 is now closed.

CAR ID	02	Section No.	-	Date : 17/03/2025
Description of CAR				
Observation: • The reporting period is from 21/02/2024 to 24/01/2025 • The calibration of weighbridge and moisture meter was conducted in May 2024. • A receipt dated 29/04/2024 was identified, which falls outside the calibration period (i.e., prior to May 2024). • The calibration certificates of both the meters (weighbridge and moisture meter), applicable for the bio-char batch applied on 29/04/2024 (receipt no. 3309), have not been provided. **Action/Concern:** Please apply the minimum margin of error for a conservative estimation of CORCs related to the bio-char application dated 29/04/2024, in accordance with the accuracy classes of both meters.				
Project participant response				**Date :** 18/03/2025
Moisture meter (model | spec sheet) – Margin of error 0.04% Weighbridge (model | Calibration Certificate) – Margin of error 0.5% Based on this 2 margins of error, we have taken the highest (0.5%) to reduce the weight of receipt no. 3309 in "CORC Report Summary-Complete_rev3" from 8.01t of wet biochar to 7.96t *(=8.01 * (1-0.5%))*				
Documentation provided by project participant				
VVB assessment				**Date:** 18/03/2025
The excel sheet "CORC Report Summary -Complete_rev3" has now been revised with the data correction factor for the conservative estimation of CORCs related to biochar application dated 29/04/2024. Closed. CAR02 is closed.				

Table 1. FAR from this verification

FAR ID	NA	Section No.	NA	Date : DD/MM/YYYY
Description of FAR				
NA				
Project participant response				**Date :** DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				**Date:** DD/MM/YYYY

APPENDIX 4: AUIDT TEAM EXPERIENCE

Competence Statement			
Name	Vardhan Kaushik		
Education	Master of Chemical Engineering B.Tech. in Chemical Engineering		
Experience:	2+ years		
Field	Energy, Carbon Calculation, Process Integration, Heat Integration, Heat and mass balance, Electric Vehicle		
Approved Roles			
Team Leader	Yes (VM)		
Validator	Yes (VM)		
Verifier	Yes (VM)		
Local expert	Yes (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	TA 1.1, 3.1, 5.1, 7.1		
Reviewed by	Shifali Guleria (Quality Manager)	**Date**	30/01/2025
Approved by	Deepika Mahala (Technical Manager)	**Date**	30/01/2025

Competence Statement			
Name	Mohd Aamir Khan		
Education	Ph. D. (Environmental Microbiology) M.Sc. (Biotechnology) B.Sc. (Life Sciences)		
Experience	5+ Years		
Field	Wastewater treatment and Waterbodies management		
Approved Roles			
Team Leader	NO		
Validator	YES		
Verifier	YES		
Local expert	YES(India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (13.1)	YES		
add rows, if necessary			
Reviewed by	Shifali Guleria (Quality Manager)	**Date**	03/01/2025
Approved by	Deepika Mahala (Technical Manager)	**Date**	03/01/2025

Competence Statement	
Name	Deepika Mahala
Country	India

Education	M. Sc. (Environment Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU		
Experience	8 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Local expert	YES (India, Bangladesh)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (X.X)	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1, TA 13.2)		
Reviewed by	Shifali Guleria (Quality Manager)	**Date**	08/07/2024
Approved by	Kaviraj Singh (MD)	**Date**	08/07/2024