South Asia

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Verification and Certification Report

of the Registered GS Project
"BaumInvest Reforestation Project"
GoldStandard Regsitry ID: 2913
Monitoring Period 1: 01/09/2007 to 28/02/2015

(Performance Certification)

Report No. 10317SH

26 February 2016

TÜV SÜD South Asia Pvt. Ltd.
Environmental Technology, Carbon Management Service
Solitaire, I.T.I. Road, Aundh, Pune- 411007, INDIA

Report No.	Date of first issue	Revision No.	Revision Date	Certificate No.
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Subject: Performance Certification of an A/R GoldStandard Project

Accredited TÜV SÜD Unit:

TÜV SÜD South Asia Pvt. Ltd.

Environmental Technology, Carbon Management Service
Solitaire, I.T.I. Road, Aundh, Pune- 411007, INDIA

Project Participant:

BaumInvest GmbH & Co KG

Goethestr. 20

79100 Freiburg

Germany

Project Site(s):

The project area consists of three separate reforestation sites in the remote Northern Zone of Costa Rica in the Province of Heredia (Canton Sarapiqui, Distrito La Virgen) and in the Province of Alajuela (Canton Upala, Distrito Delicias).

In total, the project includes an planting area of 824.56 ha out of which 798.76 ha are subject of this Performance Certification.

The PD includes information on geographic boundary. Digital boundary files are provided jointly with this report.

Project Title: BaumInvest

Applied Methodology / Version: A/R Requirements v0.9

First PD Version:

- Initial Certification: July 2010
- New Area Certification: July 2011
- New Area Certification: Aug 2014
- Performance Certification: April 2015

Final PD version:

- Date of issuance: 03 August 2010
- Date of issuance: 03 April 2013
- Date of issuance: 12 December 2014
- Date of issuance: 08 February 2016

Summary:

TÜV SÜD South Asia Pvt. Ltd. has performed the Performance Certification (Verification) of the registered GS project: “BaumInvest”.

The Management Units consist of the reforestation with native tree species in mixed stands and teak in Costa Rica. The MUs subject to the Performance Certification cover rd. 798.76 ha of planted area (i.e. no fire lines). The management of BaumInvest GmbH Co KG is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.

A document review, followed by a site visit was conducted to verify the information submitted by the project participant regarding the present verification period. Based on the assessment carried out, the verifier confirms the following:

(a) the project is implemented as planned and described in the GS registered project document (PD) Differences are described in the updated PD, in particular in regards to differences between the estimated GHG removal at validation and the verified amounts;

(b) the actual monitoring complies with the GS A/R Requirements version 0.9 and the CFS Forest Inventory Guideline.

(c) The monitoring system and equipment used for measuring GHG removals and emission reductions are reliably and appropriately. The project is generating GHG removals as a GS project.

(d) the GHG removals and emission are calculated without material misstatements.

TÜV SÜD’s opinion refers to the project’s GHG removals and emissions reported, both determined using the valid and registered project’s baseline, its monitoring plan and its associated documents. Based on the information we have seen and evaluated, we confirm that the project activity achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the project activity.

Verified net GHG removals in this monitoring period:	**13,308 t CO_{2e}**
of this 20% of the removals shall be assigned to risk buffer:	**2,662 t CO_{2e}**
Ex-post carbon credits according to GS	**10,646 t CO_{2e}**

Assessment Team Leader: Sebastian Hetsch	**Technical Reviewer:** Martin Seitz
Assessment Team Members: Martin Opitz	**Certification Body responsible:** Eswar Murty

Abbreviations

A/R	Aforestation and Reforestation
CAR	Corrective Action Request
CB	Certification Body
CDM	Clean Development Mechanism
CFS	CarbonFix Standard
CL	Clarification Request
ER	Emission reductions
FAR	Forward Action Request
FSC	Forest Stewardship Council
GHG	Greenhouse Gas(es)
GIS	Geographic Information System
GPG	Good Practice Guidance
GS	GoldStandard
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
LUF	Land Use & Forests
MP	Monitoring Plan
MU	Modelling Unit
PD	Project Document
PP	Project Participant
TÜV SÜD	TÜV SÜD South Asia
UNFCCC	United Nations Framework Convention on Climate Change

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1 INTRODUCTION

1.1 Objective

The BaumInvest GmbH & Co KG has commissioned an independent verification (Performance Certification) by TÜV SÜD of its registered GS project: “BaumInvest Reforestation Project”.

The project activitiy holds a valid FSC Certification (GFA-FM/COC-002390), thus the performance certification was conducted according to the GS requirements for dual certification.

The objective of the verification work is to comply with the requirements of the GoldStandard A/R.

TÜV SÜD has therefore assessed if:

- the project activity has been implemented as per the registered PD “BaumInvest”, and that all physical features (newly established forest areas and required monitoring equipment/sample plots) of the project are in place,
- the published MR and other supporting documents provided are complete, verifiable and in accordance with applicable GoldStandard A/R requirements,
- the actual monitoring design and procedures comply with the monitoring and forestry inventory requirements of the GoldStandard.
-

1.2 Scope

The verification scope encompasses an independent and objective review and ex-post determination of the monitored GHG removals and emissions by the Certifier. The verification is based on the submitted monitoring report, the validated project design documents including its monitoring plan and validation report, the applied monitoring methodology, relevant decisions, clarifications and guidance from the GoldStandard and any other information and references relevant to the project activity’s resulting GHG removals. These documents are reviewed against the requirements of GoldStandard and related rules and guidance.

Based on the requirements of GoldStandard, TÜV SÜD has applied a rule-based approach for the verification of the project. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification considers both quantitative and qualitative information on GHG removals and emission reductions.

The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the documentation.

1.3 Level of assurance an Materiality

The certification report expresses a conclusion with a limited level of assurance about whether the reported net anthropogenic GHG removals data is free from material misstatements. TÜV SÜD applied a materiality threshold with respect to omission or misstatements concerning reported quantities.

The audit team points out that based on the process and procedures conducted as part of this certification; there was no evidence that indicates that this GHG assertion

a) is not materially correct and is not a fair representation of the GHG data and information presented, and

b) was not prepared in accordance with the GoldStandard.

2 METHODOLOGY

2.1 Verification Process

The verification process is based on the approach depicted in the GoldStandard. Standard auditing techniques have been adopted for the verification process. The verification team performs first a desk review, followed by an on-site visit, which results in the formation of a protocol that includes all the findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report. This verification report and other supporting documents then undergo an internal quality control by the CB "Environment and Energy" before submission to the GoldStandard.

2.2 Appointment of the Team

According to the technical scopes and experiences in the sectoral or national business environment, TÜV SÜD has composed an assessment team in accordance with the appointment rules of the TÜV SÜD certification body "Environment and Energy".

The composition of an assessment team has to be approved by the Certification Body (CB) to assure that the required skills are covered by the team. The CB TÜV SÜD operates the following qualification levels for team members that are assigned by formal appointment rules:

1. Assessment Team Leader (ATL);
2. Validator/Verifier (V);
3. Trainee (T);
4. Technical Experts (TE).

It is required that the sectoral scope(s) and the technical area(s) (TA) linked to the methodology/ies and project have to be covered by the assessment team.

Assessment Team:

Name	Qualification	Scope	Technical Area	Host country experience	Onsite visit
Sebastian Hetsch	ATL	☑	☑ (14.1)	☑	
Martin Opitz	TE	☑	☑(14.1)	☑	☑

Technical Reviewer(s):

Name	Qualification	Scope	Technical area
Martin Seitz	TE	☑	☑ (14.1)

2.3 Review of Documents

The first PD for the Performance Certification was submitted to the audit team in April 2015. This PD version and additional background documents related to the project design and baseline were reviewed to verify the correctness, credibility, and interpretation of the presented information. As a further step of the certification process, information provided by the PP was cross-checked with information from other sources (if available). A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.4 On-site Assessment and follow-up Interviews

During on-site visit (27/05/2015 - 30/05/2015) TÜV SÜD performed a physical site inspection and interviewed project stakeholders to:

- confirm the implementation and operation of the project,
- review the data flow for generating, aggregating and reporting the monitoring parameters,
- confirm the correct implementation of procedures for operations and data collection,
- cross-check the information provided in the MR documentation with other sources,
- check the monitoring equipment against the requirements of the PD and the approved methodology, including calibrations, maintenance, etc.,
- review the calculations and assumptions used to obtain the GHG data and ER,
- indentify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

A list of all persons interviewed is included in the IRL attached as Annex 2 to this report.

2.5 Resolution of Clarification and Corrective and Forward Action Requests

The objective of this phase of the verification process is to resolve any outstanding issues which require clarification for TÜV SÜD's positive conclusion of the achieved GHG removals and emission reduction. The findings raised as Forward Action Requests (FARs) (if any) indicated in previous reports (validation/verification) were discussed during this phase and, issues raised in the FARs were resolved, during communications between the PP and TÜV SÜD.

Concerns raised in the desk review, the on-site audit assessments and the follow up interviews and the responses provided for the raised concerns are documented in Annex 1 (verification protocol) to guarantee the transparency of the verification process.

A Corrective Action Request (CAR) is raised where TÜV SÜD identifies:

- non-conformities in monitoring and/or reporting with the monitoring plan and/or methodology;
- that the evidence provided is not sufficient to prove conformity;
- mistakes in assumptions, data or calculations that impair the ER;
- FARs stated during validation that are not solved until the on-site visit.

A Clarification Request is raised where TÜV SÜD does not have enough information or the information is not clear in order to confirm a statement or data. A Forward Action Request is raised where TÜV SÜD identifies that monitoring and/or reporting require special attention or adjustments for the next verification period. Information or clarifications provided as a response to a CAR, CL or FAR could also lead to a new request.

2.6 Internal Quality Control

As a final step of verification, the final documentation including the verification report and annexes have to undergo an internal quality control by the Certification Body (CB) "Environment and Energy", i.e. each report has to be finally approved either by the Head of the CB or the Deputy. In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Request for Issuance is submitted to the GS along with the relevant documents.

3 VERIFICATION RESULTS

The verification findings and results are detailed in Annex 1 of this report.
Each GS criterion was assessed, as well as the correct implementation of the Monitoring Plan as per the registered PD, and the results of the monitoring

4 CERTIFICATION CONCLUSION & OPINION

TÜV SÜD performed a Performance Certification registered GoldStandard project activity "BaumInvest Reforestation Project". The verification is based on the currently valid version 0.9 of the GS A/R Requirements.

The management BaumInvest GmbH & Co KG is responsible for the preparation of the GHG removals and emissions data and the reported GHG emission reductions on the basis set out within the project's registered PD.

The verifier confirms that:

- the project is implemented as planned and described in the project document approved and registered by the GS. Differences are described in the updated project description, in particular in regards to differences between the estimated GHG removal at validation and the verified amounts;
- the monitoring essential for measuring GHG removals by sinks and emission reduction is appropriate and in accordance with the A/R requirements and the CFS "Forest Inventory Guideline";
- the GHG removals and emissions are calculated without material misstatements;

Our opinion is based on the project's GHG removals and emissions reported, which have been both determined through the valid and registered project's baseline, its monitoring plan and its associated documents.

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01 Sep 2007 to 28 Feb 2015

Verified net GHG removals in this monitoring period:	**13,308 t CO_{2e}**
of this 20% of the removals shall be assigned to risk buffer:	**2,662 t CO_{2e}**
Ex-post carbon credits according to GS	**10,646 t CO_{2e}**

Baseline emissions, Project emissions and Leakage was considered as defined in the validated PD and initial certification report.

Pune, 26/02/2016

Murty Eswar
Certification Body "Environment and Energy"
TÜV SÜD South Asia Pvt. Ltd.

ANNEX 1 - LIST OF FINDINGS

Key Project Information (2.1)

Key Project Information

A general description shall be provided which includes all of the following items:
(a) Project activities
(b) Organisations that are involved in the project (project participants)
(c) Communities involved in the project
(d) Location of the project area and the planting area
(e) Size of the project area and the planting area
(f) Risk of change to the project area (during the crediting period)
(g) Risk of change to the project activities (during the crediting period)
(h) Timeframe for the project activities
(i) Number of (predicted) CO_2-certificates
(j) Land-use history and current situation of the project area
(k) Socio-economic history and current situation
(l) Forest management applied (past and future)
(m) Forest characteristics (including main tree species planted)
(n) Main social impacts (risks and benefits)
(o) Main environmental impacts (risks and benefits)
(p) Financial structure

Findings

(a) The Project activities are described in detail (IRL 3). Objective is:
- Restoration of forest landscapes in Costa Rica with native tree species in mixed stands and teak.
- Sustainable management and production of high quality timber
- Mitigation of global warming and climate change via long-term carbon sequestration in trees.

No changes since Initial Certification and New Area Certification respectively.

(b) Project Participants are listed, responsibilities and property are described. No changes since Initial Certification and New Area Certification respectively.

(c) Communities involved in the project are described. No changes since Initial Certification and New Area Certification respectively.

(d) The location of the project area respectively the planting area are provided (IRL 4, 5). No changes since Initial Certification and New Area Certification respectively

(e) The size of the project area is described (IRL 4, 5). The area differs from that during Initial/New Area Certification.
1. Project areas Los Pinos have been part of La Virgen
2. 822,17 ha vs. 824,33 ha.

(f) Risks of change to the project area described as low as the PPs hold uncontested legal land titles for the areas. No changes since Initial Certification and New Area Certification respectively.

(g) Risks of change to the project are described as low, the budget plan provides sufficient funding for the implementation of the project No changes since Initial Certification and New Area Certification respectively.

(h) The timeframe is 30 years and thus in compliance with the standard. No changes since Initial Certification and New Area Certification respectively.

(i) Amount of predicted CO2-certificates is provided. A total of Emissions Reduction over a 30 year crediting period of 166,090 t CO2e is predicted (IRL 6, 7, 8, 9).

(j) The historical and the current situation of the project area is described,

(k) including the socio-economic condition, changes in land-use and property rights. The new management units do not differ significantly from the socio-economic set-up then the initial project areas. No changes since Initial Certification and New Area Certification respectively.

Findings
(l) The forest management applied is described, the project is successfully FSC certified (IRL 10, 11). (http://info.fsc.org/details.php?id=a0240000008U6b0AAC&type=certificate&return=certificate.php). (m) Species composition planted is described in detail (IRL 2). The plantings consist predominantly of even-aged mixed stands using up to four different, mostly native side-adapted tree species for each modelling unit. No changes since Initial Certification and New Area Certification respectively. (n) Long term employment, social insurance and accident insurance as well as opportunities for agricultural production via agro-forestry systems are described. No changes since Initial Certification and New Area Certification respectively. (o) A list of environmental impacts, mainly positive, are listed. Amongst other the sustainable management of near-to-nature secondary forest, management of HCVF, planting of Dipterys Panamensis (endangered species) and environmental education. No changes since Initial Certification and New Area Certification respectively. (p) The financial structure is described. The project is funded through private small investors. Sufficient funding is secured over the first rotation period. No changes since Initial Certification and New Area Certification respectively.
CR / CAR
Clarification Request 1. Clarify different area sizes and allocation of parcels (e).
Respond by PP: (e) 1. Modifications regarding the two properties of Finca Los Pinos (La Virgen) are explained in detail in the PD of the last New Area Certification (Ref. 2.1-07). (e) 2. Minor deviations in the size of the planting area (0.26 %) are results of rounding effects and rounding rules in the Carbon Fix Standard, which was applied to previous certifications of this project (Initial Certification and 1st New Area Certification). Including small-sized Modelling Units (< 0.5 ha) the planting area totals 824.54 ha. Figure 2.1-01 in the Key Project Information has been adjusted accordingly. *Ref: 2.1-07_PD_BRP_GS-LUF, Key Project Information (j), Page 3*
Conclusion Audit Team: No information was found regarding modifications of the two properties of Finca Los Pinos. Please specify where exactly the information can be found. The areas (project area/planted area) listed in the PD shall match the areas used for the calculation of the net CO2 fixation achieved as well as the areas to be taken from the shape-files provided. At present this is not the case.
Respond by PP: (e) 1. Modifications regarding the two properties of Finca Los Pinos (La Virgen) are explained in detail in the PD of the last New Area Certification: *Key Project Information (j), Paragraph 3, Page 3* (Ref. 2.1-07). (e) 2. Minor deviations in the size of the planting areas used for the calculation of the net CO2-fixation have been adjusted in the PD. Regarding the project areas, we decided to use the exact data from the legal documents (entry in the national land registry and cadastral maps) in the PD rather than the areas from the shapefiles provided. Since many of the areal data in the legal documents were collected in the 1970ies and 1980ies with other measuring methods than GPS, it is comprehensible, that these do not match exactly with the shapefiles based on our own mappings in the field. Since this deviation does neither affect the size of the management units nor the CO2-fixation, it shall be disregarded. *Ref: 2.1-07_PD_BRP_GS-LUF*
Conclusion Audit Team: Information regarding modifications of the two properties of Finca Los Pinos is provided as described. The planting area of the project totals 824.56 ha out of which 798,76 ha were taken for the calculation of the net

Findings
CO2-fixation of the present Performance Certification. Areas listed in the PD and match those taken for the calculation of the net CO2 fixation. Request closed. ✓
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Shapefile

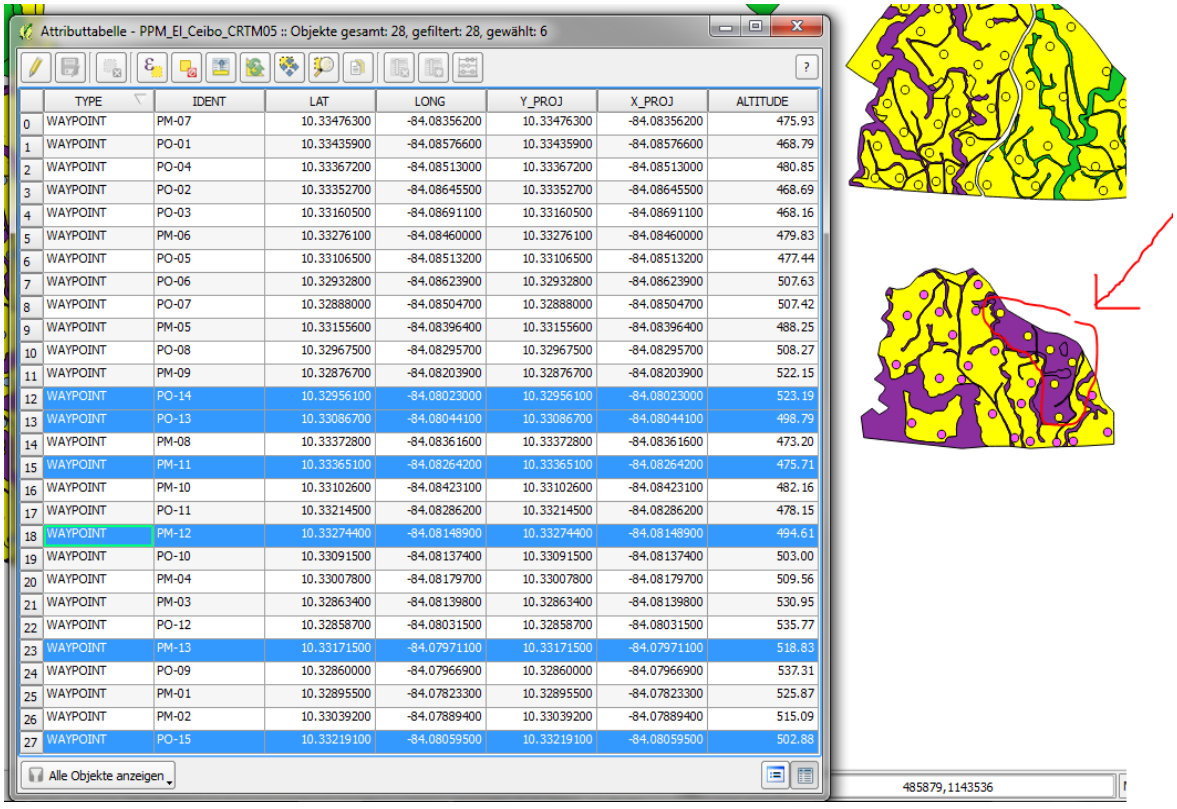
***Shapefiles* and *supporting documents* as well as respective references shall be provided.**

The following information shall be clearly defined by the use of shapefiles:

(a) Project area
(b) Planting areas
(c) Eligible planting area
(d) Modelling Units
(e) Infrastructure (roads, houses, etc.)
(f) Water bodies
(g) Sites with special significance for indigenous people and local communities - resulting from the Local Stakeholder Consultation (LSC)
(h) Where indigenous people and local communities are situated
(i) Where indigenous people and local communities have legal rights, customary rights or sites with special cultural, ecological, economic, religious or spiritual significance

Findings
Shapefile were provided (IRL 4, 5) Before the onsite visit the following inconsistencies were detected: Five sample plots are located outside the Modelling Units.

Findings



	TYPE	IDENT	LAT	LONG	Y_PROJ	X_PROJ	ALTITUDE
0	WAYPOINT	PM-07	10.33476300	-84.08356200	10.33476300	-84.08356200	475.93
1	WAYPOINT	PO-01	10.33435900	-84.08576600	10.33435900	-84.08576600	468.79
2	WAYPOINT	PO-04	10.33367200	-84.08513000	10.33367200	-84.08513000	480.85
3	WAYPOINT	PO-02	10.33352700	-84.08645500	10.33352700	-84.08645500	468.69
4	WAYPOINT	PO-03	10.33160500	-84.08691100	10.33160500	-84.08691100	468.16
5	WAYPOINT	PM-06	10.33276100	-84.08460000	10.33276100	-84.08460000	479.83
6	WAYPOINT	PO-05	10.33106500	-84.08513200	10.33106500	-84.08513200	477.44
7	WAYPOINT	PO-06	10.32932800	-84.08623900	10.32932800	-84.08623900	507.63
8	WAYPOINT	PO-07	10.32888000	-84.08504700	10.32888000	-84.08504700	507.42
9	WAYPOINT	PM-05	10.33155600	-84.08396400	10.33155600	-84.08396400	488.25
10	WAYPOINT	PO-08	10.32967500	-84.08295700	10.32967500	-84.08295700	508.27
11	WAYPOINT	PM-09	10.32876700	-84.08203900	10.32876700	-84.08203900	522.15
12	WAYPOINT	PO-14	10.32956100	-84.08023000	10.32956100	-84.08023000	523.19
13	WAYPOINT	PO-13	10.33086700	-84.08044100	10.33086700	-84.08044100	498.79
14	WAYPOINT	PM-08	10.33372800	-84.08361600	10.33372800	-84.08361600	473.20
15	WAYPOINT	PM-11	10.33365100	-84.08264200	10.33365100	-84.08264200	475.71
16	WAYPOINT	PM-10	10.33102600	-84.08423100	10.33102600	-84.08423100	482.16
17	WAYPOINT	PO-11	10.33214500	-84.08286200	10.33214500	-84.08286200	478.15
18	WAYPOINT	PM-12	10.33274400	-84.08148900	10.33274400	-84.08148900	494.61
19	WAYPOINT	PO-10	10.33091500	-84.08137400	10.33091500	-84.08137400	503.00
20	WAYPOINT	PM-04	10.33007800	-84.08179700	10.33007800	-84.08179700	509.56
21	WAYPOINT	PM-03	10.32863400	-84.08139800	10.32863400	-84.08139800	530.95
22	WAYPOINT	PO-12	10.32858700	-84.08031500	10.32858700	-84.08031500	535.77
23	WAYPOINT	PM-13	10.33171500	-84.07971100	10.33171500	-84.07971100	518.83
24	WAYPOINT	PO-09	10.32860000	-84.07966900	10.32860000	-84.07966900	537.31
25	WAYPOINT	PM-01	10.32895500	-84.07823300	10.32895500	-84.07823300	525.87
26	WAYPOINT	PM-02	10.33039200	-84.07889400	10.33039200	-84.07889400	515.09
27	WAYPOINT	PO-15	10.33219100	-84.08059500	10.33219100	-84.08059500	502.88

CR / CAR

Clarification Request 2.

Clarify why five sample plots are located outside of Modelling Units

Respond by PP:

The respective area was part of the planting area (Modelling Unit "MU Ceibo" 46.89 ha) validated in the 1st New Area Certification. However, the Modelling Unit was afterwards divided into two separate Modelling Units "MU Ceibo_1" (38.48 ha) and "MU Ceibo_2" (8.41 ha). The five sample plots in question are located in the Modelling Unit "MU Ceibo_2". The shapefiles have been updated accordingly.

Conclusion Audit Team:

Updated shapefiles were provided. Sample plots have been left out of the MUs by mistake while preparing the GIS shape files. The sample plots are now located within MU Ceibo_2. Request closed.

✓

Final Conclusion

☒ Accepted
☐ Accepted with FAR (01-01 ID of the FAR)
☐ Not accepted with NCR (01-01 ID of the NCR)

Boundaries

Boundaries of the project area and the planting area shall be clearly distinguishable in the field

Findings
During the onsite visit, the audit team sustained that the boundaries are predominantly clearly distinguishable in the field due to the differing species composition. Nevertheless, the onsite visit revealed that there are areas without trees due to loss on the Finca Las Delicias. Sample plots do not represent these areas.
CR / CAR
Corrective Action Request 1. Provide shapefiles representing areas with and without trees.
Respond by PP: Updated shapefiles of the Finca Las Delicias (Upala) with the results of a field survey carried out following the onsite visit have been submitted to the audit team. In total 4 plots covering altogether 4.19 ha of planting area with a total or almost total loss of the planted trees caused by an extraordinary inundation event were identified. Hereupon, the affected areas have been deducted from the planting area of the respective modelling units in the growth model and the corresponding calculation of the CO2-fixation has been adjusted accordingly. The areas will be replanted to recover the resulting shortfalls.
Conclusion Audit Team: Shape-files were provided that show areas with a total or almost total loss of the planted trees. According to the GIS-files the area is 4.48 ha not 4.19 ha.
Respond by PP: The area of 4.19 ha of planting area with a total or almost total loss of the planted trees is correct. The difference of 0.29 ha results from an area outside of the planting area used for the calculation of the net CO2-fixation and hence it was ignored.
Conclusion Audit Team: An explanation was provided and crosschecked by the Audit Team by assessing the GIS data and calculations files provided. Request closed. ✓
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Do-No-Harm Assessment (3.1)

#
Not applicable as dual certification is applied.

With respect to potential *dual certification* The Gold Standard recognizes that FSC certification can replace the requirements of section '3. Sustainability' (except for chapter '3.5 Legal Rights') and chapter '7.4 Reporting' of the 'A/R Requirements'.

Local Stakeholder Consultation (3.2)

Not applicable.

Input & Grievance Mechanism (3.3)

#
Not applicable as dual certification is applied.

With respect to potential *dual certification* The Gold Standard recognizes that FSC certification can replace the requirements of section '3. Sustainability' (except for chapter '3.5 Legal Rights') and chapter '7.4 Reporting' of the 'A/R Requirements'.

Sustainability Monitoring Plan (3.4)

#
Not applicable as dual certification is applied.

With respect to potential *dual certification* The Gold Standard recognizes that FSC certification can replace the requirements of section '3. Sustainability' (except for chapter '3.5 Legal Rights') and chapter '7.4 Reporting' of the 'A/R Requirements'.

#

Legal Rights (3.5)

Secured Titles

1. For all project participants, the following information shall be provided:
   (a) Name and contact details
   (b) Each entity's legal registration number and documentation by the governing jurisdiction that proves that the entity is in good standing.
2. For the duration of the crediting period the project owner shall:
   (c) Own the CO2 user rights or carbon sequestration rights for the project area, AND
   (d) Hold an uncontested legal land title for the project area, AND
   (e) Own the rights for timber and non---timber forest products for the project area, AND
   (f) Hold all necessary permits to implement the project (planting permits, infrastructure permits, harvesting permits, etc.), AND
   (g) Participate in the financing of the project.

   If the project owner does not meet all of the above requirements, the persons or legal entities that do meet those respective requirements shall endorse the expected project being undertaken by the project owner through an agreement that aligns with the duration of the crediting period.

Findings
Name and contact details are provided. The following companies are involved: a. BaumInvest 2 GmbH & Co KG b. Isla Bosques Numero II de Costa Rica S.A. (100 % subsidiary of BaumInvest 2 GmbH) c. Querdenker GmbH d. Puro Verde Paraiso Forestal S.A. Copies of extract of the commercial register in Freiburg i.Brg. as well as of the national register of the Republic of Costa Rica are provided proofing that the entity is in good standing (IRL 13 - 17). Based on the documents provided as well as the local experience the audit team confirms the full legal right of the PPs over the project including the rights to implement the project as described as well as carbon rights.
CR / CAR
-
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Risk Register (3.6)

Not applicable as dual certification is applied.

With respect to potential *dual certification* The Gold Standard recognizes that FSC certification can replace the requirements of section '3. Sustainability' (except for chapter '3.5 Legal Rights') and chapter '7.4 Reporting' of the 'A/R Requirements'.

Additionality (4)

Not applicable.

For the Performance Certification the project owner is not required to update the template "Additionality"

Methodology (5)

Applicability (5.1)

Not applicable.

For the Performance Certification the project owner is not required to update the template "Applicability"

Conversion Procedure (5.2)

Not applicable.

For the Performance Certification the project owner is not required to update the conversion factor.

Calculation of CO2-certificates (5.3)

1. The number of CO2-certificates is determined for every year (t) of the crediting period using the following formula.

CO2---certificates MU,t
= (CO2-Fixation MU,t - Baseline MU,t - Leakage MU,t - Other Emissions MU,t) * Eligible planting area MU

2. For the calculation of the parameters CO2-Fixation, Baseline and Leakage, the following carbon pools shall be assessed:

Findings
1. CO2-certificates are calculated in compliance with the formula provided (IRL 3, 18 – 47). Before onsite calculation files only for the Finca San Rafael were provided. See also chapter 5.7 2. Carbon Pools: • CO2-Fixation: Carbon Pools are included as required • Baseline: For the baseline only the Non-tree biomass was assessed as the eligible areas are plane grassland/fallow land • Leakage: Carbon Pools are included as required MU Reports have not been provided as required. See also chapter 5.7.
CR / CAR
Corrective Action Request 2. • Provide missing calculation files • Provide MU Reports
Respond by PP: The missing calculation files have been submitted to the audit team. *Ref. 5.7-02_Forest-Inventory-XLS_San Rafael*

Findings
Ref. 5.7-03_Forest-Inventory-XLS_La Virgen *Ref. 5.7-04_Forest-Inventory-XLS_Las Delicias*
Conclusion Audit Team: Missing calculation file have been provided (IRL 3). The calculations of the CO2-fixation per MU is correct. The calculation of the relative margin of error reached is not correct. Thus, the deduction due to not reached precision level is not correct. (e.g. the relative margin of error for MU_Upala_2 = rd. 100%, for MU_Upala_3 = rd. 280%)
Respond by PP: For the calculation of the uncertainty threshold of ±20% at a 90% confidence interval the following formula provided in the "Assisting & Background Documents" in the CarbonFix Standard (version 3.2) was applied: $\sqrt{\left(\frac{s^2 * t^2}{n}\right) - \left(\frac{s^2 * t^2}{N}\right)} * \frac{1}{x} = \frac{t * sx}{x}\sqrt{1 - \frac{n}{N}}$ n = Number of sample plots N = Number of sample plots possible per strata (area strata / area sample plot) s = Standard deviation sx = Standard error of the mean t = T-value x = Mean This formula is equivalent to the formula given in the recent version of the respective CDM AR-tool (Ref. 5.7-06) for the calculation of "uncertainty", expanded by the *finiteness correction factor* used in simple random samplings: $\sqrt{(1 - n/N)}$ However, by mistake, the standard *t*-value of "2" was generally applied in all our calculations, instead of using the specific *t*-values of a two sided *t*-distribution at a 90% confidence interval corresponding with the respective degrees of freedom. The calculation files have now been corrected with the specific *t*-values and the results have been updated in the respective templates, too. Where the error is above the required precision level of 20%, the additional difference was deducted from the mean "Stem volume" as shown in the example given in the A/R Requirements (Ref. 5.7-05, page 38). Some Modelling Units (MU), which are still showing a high degree of heterogeneity in growth patterns (mostly because of the relatively young age (< 3 years) of the trees in some MUs) have been excluded from the present calculations of the CO2-fixation, particularly, when the deduction led to a (calculatory) negative result, although existing and measured stem volumes are quite considerable. *Ref. 5.7-05_AR-Requirements_v0-9* *Ref. 5.7-06_ar-am-tool-14-v4.2 (6. (a), page 4)*
Conclusion Audit Team: The calculations of the CO2-fixation per MU were revised and corrected. The calculations were assessed by the audit team and found to comply with the requirements of the standard. Request closed. ✓
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Other Emissions (5.4)

1. Where existing 'tree' and 'non-tree' biomass of the Baseline is burned for the purpose of land preparation, an additional 10% of the Baseline shall be deducted. This is to account for the non-CO_2 green-house-gas emissions (N_2O and CH_4) that are released during the burning process.

2. 0.005 tCO_2 per kg of nitrogen (N) fertilizer shall be deducted. No differentiation is made between synthetic and organic fertilizer.

Findings
No information is provided.
CR / CAR
Corrective Action Request 3. Provide information regarding other emissions.
Respond by PP: The required template "5.4 Other Emissions" has been added to the project documentation.
Conclusion Audit Team: According to Clarification Request ID 001 accounting for fertilizer use is not accounted for. Respective information is provided. Request closed. ✓
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Baseline (5.5)

Not applicable.
For the Performance Certification the project owner is not required to update the template "Baseline"

Leakage (5.6)

Not applicable. For the Performance Certification the project owner is not required to update the template "Leakage"

CO2-Fixation (5.7)

Forest Inventory / Present CO2-Fixation

1. The growth-models of the MUs shall be confirmed/adjusted by the results of MU specific forest inventories
2. For the forest inventories, the guidelines of the BioCarbon Fund or CarbonFix shall be followed.
3. The process of a forest inventory shall be documented clearly and easy replicated.
4. Forest inventories shall be repeated at minimum before every Performance Certification
5. The number of sample plots of a forest inventory shall be sufficient to meet a MU precision with a maximum error of ±20% at a 90% confidence interval. Where the error is above 20%, the additional difference shall be deducted. Provide an overview for which MUs this requirement was relevant and describe the adaptation.

Findings

Calculations based on inventories conducted were provided for the Finca San Rafael only.

1. The growth-model of the MUs was not yet adjusted by the results of the MU specific forest inventories
2. Guidelines for the forest inventory were not provided
3. The process of the forest inventory was replicated during the onsite visit (IRL 48) and found to comply with good practice (IRL 18, 19).
   The following amounts parcels were remeasured during the onsite visit
   - La Virgen I & II a total of 14 out of 278 sample plots = 5%
   - Las Delicias a total of 8 out 57 sample plots = 14%
   - San Rafael a total of 8 out of 65 sample plots = 12 %

   For each sample plot, about 30% of the measurements (DBH and Height) were repeated (IRL 48).
   The variance of the original data and the measured data was tested according to the F-value test in order to detect if both variances origin from the same population. The result of the assessment showed that no significant difference between the differences of the two separate measurements could be identified, thus no bias was identified.
4. The date of the forest inventory was before the Performance Certification. The field sheets examined show the date of the inventory.
5. Not all MUs meet the precision level required. An overview as required was not provided.

CR / CAR

Corrective Action Request 4.

1. Clarify how the growth-model of the MUs will be adjusted
2. Provided guidelines for the forest inventory
5. Provide an overview of all MUs that do not meet the precision level required and describe adaptations

Respond by PP:

1. From our perspective, the forest inventories lead basically to a confirmation of the existing growth-models, although the present net CO2-fixation is considerably below the predicted CO2-fixation. The results for the widely-used and well known tree species *Tectona grandis* exceed our expectations even after the first thinnings and support the conservative approach applied to the existing growth models. For most of the other predominantly native tree species far less experience and information about plantation management and growth rates is available. However, our own experience since the start of planting and the results of the present forest inventory (particularly of the oldest plantations at San Rafael) lead to the expectation, that these tree species will also reach the predicted stem volumes within the crediting period. The only difference is, that growth rates were less in the first years after planting, but are now already increasing

Findings
significantly and will probably increase even more in the next few years. 2. The guidelines of the CarbonFix Standard were applied for the forest inventories (Ref. 5.7-01). 5. All results and calculations are fully detailed in the forest inventory excel files (Ref. 5.7-02, 5.7-03, 5.7-04), including the analysis of the respective precision levels. Where the error is above 20%, the additional difference was deducted from the mean "Stem volume" as shown in the example given in the A/R Requirements (Ref. 5.7-05, page 38). *Ref. 5.7-01_CFS_Forest-Inventory-Guideline* *Ref. 5.7-02_Forest-Inventory-XLS_San Rafael* *Ref. 5.7-03_Forest-Inventory-XLS_La Virgen* *Ref. 5.7-04_Forest-Inventory-XLS_Las Delicias* *Ref. 5.7-05_AR-Requirements_v0-9*
Conclusion Audit Team: Calculation files for the missing plantation areas are provided. 1. Only qualitative descriptions are provided. For the back ground of the findings of CAR 2 and CAR 5 more detailed information is required to follow the argumentation of the PPs. 2. The guidelines applied are provided as requested. 5. The calculation of the relative margin of error reached is not correct. Provide revised calculations. (See also findings CAR 2)
Respond by PP: 1. see responses CAR 5 (1-4) 5. Revised calculations have been provided to the audit team. (see also response CAR 2)
Conclusion Audit Team: 1. The project proponent provided a detailed quantitative description in the section Carbon Performance 6.1 of this protocol (see below). The growth models applied were only partly confirmed. For the back ground of the information provided and the validity of the ex-ante calculations it is acceptable not to adjust the growth models at this stage of the plantation activity but to await the future development and performance of the tree species planted. At present an additional benefit of the adjustment of the growth models cannot be ascertained. 5. The calculations files were revised as required, the relative margin of error is now calculated correctly. Request closed.
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

Carbon Performance (6.1)

1. Describe the shortfalls of the project:

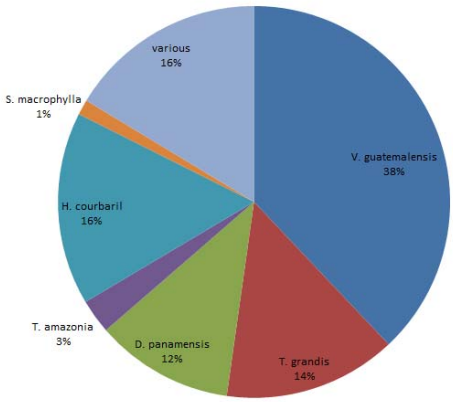
2. Describe how you propose to make the project compliant again, latest in 5 years:

At any time during a crediting period, the project owner shall ensure that the quantity of the validated and verified CO2---certificates with respect to the project is less than or equal to the project's expected carbon stocks (validated CO2---certificates) and actual carbon stocks (verified CO2---certificates).

Incidents, or events, that effect compliance with requirement 1 shall be reported to The Gold Standard Secretariat. If they occur outside a certification process, the incidents or events shall be reported to The Gold Standard Secretariat no more than 30 days after their discovery. The template 'Carbon Performance' shall be used for this reporting.

If compliance with requirement 1 is not maintained, the project owner shall demonstrate to The Gold Standard Secretariat how the project will realistically recover appropriate levels of carbon stocks to comply with requirement 1.
The project owner shall use one or more of the following approaches:
(a) retiring/locking of CO2---certificates from the project which are not yet transferred or retired/locked
(b) purchasing of CO2---certificates from any other Gold Standard certified projects (these can also be from other project types such as renewable energy)
(c) replanting of an appropriate planting area and recovery of the project carbon stocks overtime
(d) planting of new areas to generate further CO2---certificates.
During the period where the project owner is not incompliance with requirement 1, an equal number of CO2---certificates from The Gold Standard Compliance Buffer will be put 'on---hold'.

Findings
No information provided.
CR / CAR
Corrective Action Request 5. Provide information about the Carbon Performance of all MUs involved.
Respond by PP: The template "6.1 Carbon Performance" with supporting documentation has been added to the project documentation.
Conclusion Audit Team: Required information was provided (IRL 49) The present net CO2-fixation as well as the negative balance listed in 6.1 - Template - Carbon Performance_GS 2913_150811 are wrong according to 6.1_Carbon Performance_150811. At present, the CO2-fixation achieved by the project activity matches 27% of the CO2-fixation predicted, thus the negative balance is 73%. Several observations are listed and described but not quantitatively sustained: 1) How many (percentage) younger trees have still a DBH less than 1 cm? How big is the area covered by those small trees? 2) What tree species are planted in the oldest plantations? In how far do the predictions of these tree species match the actual growth rates achieved? 3) Off all tree species planted how many predictions are based on linear growth models? 4) How big is the difference due to the application of realistic survival rates? How many CO2-certificates shall be locked? Due to the wrong figures in 6.1 - Template - Carbon Performance_GS 2913_150811 (see comment above)

Findings
the shortfall/misbalance of issued carbon credits amounts to -7.997 tCO2. At present net CO2-fixation covers only rd. 95% of CO2-certificates transferred to the Gold Standard Compliance Buffer The PP suggests approaches a, b, c and d to meet the shortfall: 1. Clarify how CO2-certificates can be retired or locked when only 95% of the certificates in the buffer are covered with net CO2-fixation 2. Clarify where the amount 13.863 tCO2 comes from Specify the exact amount that needs to be replaced by other GS-certificates. Provide proof, that a respective amount was purchased. 3. Clarify the size of the area that will be replanted Clarify which species will be used. 4. According to the GIS-shape-files provided MU_El Peje amounts up to rd. 49 ha. Provide respective shape-files showing the area. Explain the process of rectification and clarify until when the mentioned are can be added to the project.
Respond by PP: The results of the present net CO2-fixation have been corrected after revised calculations. The respective documents have been updated accordingly. 1. Younger trees with a DBH less than 1 cm can be found mostly at Finca Las Delicias, where up to 26% of the planted trees per MU have a DBH less than 1 cm. The tree species affected are primarily slow-growing species, for instance H. courbaril, D. retusa, C. brasiliense. Modelling Units with 7-26% of trees with a DBH <1 cm cover more than 62 ha (35%) of the planting area at Finca Las Delicias. 2. The tree species predominantly planted in the oldest plantations of the project at Finca San Rafael (established in 2007 - 2009) are: T. grandis, S. macrophylla, T. amazonia, D. panamensis and V. guatemalensis. The maximum mean annual increment (MAI) measured for T. grandis and V. guatemalensis already exceeded the MAI used in the respective growth models and the MAI of T. amazonia is close to the value of the growth model. Only S. macrophylla and D. panamensis still show larger deficiencies in comparisson to the growth models but increased growth rates in comparrison to the more recently planted trees at La Virgen and Las Delicias. However, the age of the trees measured to determine the MAI for D. panamensis in the scientific study cited was 13 years, which means that there are still 8 years left for these trees to match with the predicted growth rates. The figure below shows the tree species planted in perecent of all trees planted in the project. As a result, the tree species with growth rates exeeding the values used in our growth models account for more than 50% of all trees planted.    3. Linear growth models were applied to all tree species planted in the project. Although a detailed growth modell for T. grandis exists, we also used a linear growth model for a consistent and simplified spreadsheet analisis. So far, all of the measured growth rates for T. grandis exceed, by far, the growth modell applied for the calculation of the CO2-fixation of the project. 4. The application of realistic survival rates resulting from the present forest inventories leads to a

Findings
deduction of a total of 18.668 tCO2 - equivalent to 11% of all CO2-certificates already issued for the project. All of these CO2-certificates shall be locked until appropriate levels of carbon stocks are being recovered over time. The revised net CO2-fixation of the project sums up to 13.308 tCO2, whereas the buffer currently amounts to a total of 13.873 tCO2 (28%). The present buffer is a mixture consisting of an Initial Certification and a New Area Certification according to the rules of the CarbonFix Standard with a buffer of 30% each, as well as a New Area Certification according to the rules of the Gold Standard LUF with a 20% buffer. In total, 28% of the CO2-certificates of the project are currently locked in the buffer. Only after the first Performance Certification the global buffer of the project will be reduced to 20% equivalent to 9.875 tCO2. a) On the assumption that the current buffer of 13.873 tCO2 (28%) will be reduced to 9.875 tCO2 (20%), the net positive balance is 3.433 tCO2. To allow for the utilization of the maximum of the present net CO2-fixation of 13.308 tCO2, the respective volumes of the project buffer will be replaced by purchasing of CO2-certificates from another Gold Standard certified project (approach b) and A/R Requirements "Issuance"). Consequently, up to 13.308 CO2-certificates can be retired or locked. b) 1. see a) The amount of 13.863 tCO2 was an erroneous number. The correct amount of the present net CO2-fixation is 13.308 tCO2. 2. see a) 3. Proof, that a respective amount of GS-certificates was purchased, has been submitted to the audit team. c) All areas with a total or almost total loss of trees identified in the course of the Performance Certification (Finca Las Delicias) will be replanted to recover project carbon stocks over time. The size of these areas totals 4.19 ha. The species proposed to be planted are: Cebo, Guapinol, Cedro María, Laurel, Pilón, Roble sabana or Teak. Almost half of the area (approx. 2 ha) has already been replanted, whereas the rest will be replanted within the next couple of months. d) Regarding the project area of El Peje_1, we realise a significant discrepancy between the area of 56.82 ha shown in the legal documents (entry in the national land registry and cadastral maps) and the area of 64.89 ha resulting from our own GPS mappings (shapefiles). The calculative difference in project area accounts for 8.07 ha. Since the area in question is not a specific area but rather consists of many minor deviations alongside the boundaries of the property (Ref. 6.1-01), we decided to deduct the entire area of 8 ha from the planting area of 49.41 ha - following the conservative approach of the Standard. The process of rectification requires a new mapping of the three properties conducted by an accredited topographer, accompanied by the adjacent landowners and the municipality of San Ramón de la Virgen as owner of the public road. From the perspective of the project owners, the rectification of the project boundaries is not a matter of urgency, but costly and time-consuming, due to slow and bureaucratic processes. However, the project owners agreed to conclude the rectification until the next Performance Certification in 2020, at the latest. *Ref. 6.1-01_El peje-areal deviation*
Conclusion Audit Team: 1. The project proponent provided a detailed quantitative description of the current shortfall of the project activity as well as the potential of the plantation to meet the predicted volumes in the future. As analysed in the section above the growth models applied were only partly confirmed. Nevertheless for the back ground of the information provided, the plantation performance so far and the validity of the ex-ante calculations it is likely that the plantation will cover the shortfall on the long run. The development and performance of the tree species planted within the next five years will allow a solid judgement if the project activity will meet compliance with its predictions. 2. Information is provided how the project will most probably meet compliance with the ex-ante predictions made at the time of initial certification.

Findings
As compliance with requirement 1 is not met at time of the performance certification, the project proponent purchased credits from another Gold Standard project, respective evidence was provided (IRL 51). The areas with a total loss of plants have been already replanted or will be replanted. A proof was not provided but as only a comparable small area (rd. 4ha = < 1% of planting area) is affected further proof is found to be negligible. As the project activity follows a precautionary approach by deducting the difference in area size between the area of the legal documents (cadastre) and the area resulting from GPS mapping from the actual planting area, conservativeness is ensured (IRL 50). Request closed. ✓
Final Conclusion
☒ Accepted ☐ Accepted with FAR (01-01 ID of the FAR) ☐ Not accepted with NCR (01-01 ID of the NCR)

ANNEX 2 - INFORMATION REFERENCE LIST

Ref. No.	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information
1.	TÜV-SÜD	Interviewed Persons: 2. Stefan Pröstler – Gerente General 3. Guillermo Alvarado – Gerente Dpt. Forestal 4. Michael Metz – Project Manager	27. 29. May 2015	n.a.
2.	PP	Project Description (for the Performance Certification): BaumInvest Reforestation Project Version before Onsite Visit	9 Apr 2015	single documents not to one document summarised.
3.	PP	Forest Inventory_San Rafael / La Virgen / Las Delicias (Excel-Spreadsheets): - 5.7-02_Forest Inventory_San Rafael_160208 - 5.7-03_Forest Inventory_La Virgen_151125 - 5.7-04_Forest Inventory_Las Delicias_151125	Nov 2015	n.a.
4.	PP	Shapefiles of all planting areas and MUs: - 2.2-01_BI1_San Rafael_shapefiles - 2.2-02_BI1_La Virgen_shapefiles - 2.2-03_BI2_La Virgen-2_shapefiles - 2.2-04_BI2_Las Delicias_shapefiles	9 Apr 2015	n.a.
5.	PP	Maps of all planting areas and MUs: - 2.2-05_BI1 San Rafael_maps - 2.2-06_BI1_La Virgen_maps - 2.2-07_BI2_La Virgen-2_maps - 2.2-08_BI2_Las Delicias_maps	9 Apr 2015	n.a.
6.	TÜV-SÜD	Validation Report BaumInvest GmbH & Co KG VALIDATION OF THE CARBONFIX-PROJECT: BAUMINVEST REFORESTATION; PROJECT REPORT NO. 1455389	3 Aug 2010	n.a.
7.	TÜV-SÜD	Certification Report MANAGEMENT UNIT CERTIFICATION OF THE CARBONFIX-PROJECT: BAUMINVEST REFORESTATION PROJECT; REPORT NO. 600500758	3 Apr 2013	n.a.

Ref. No.	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information
8.	TÜV-SÜD	New Area Certification Report NEW AREA CERTIFICATION OF THE A/R GOLDSTANDARD PROJECT: ”BAUMINVEST REFORESTATION PROJECT”; REPORT NO. 10218SH	25 Feb 2015	n.a.
9.	TÜV-SÜD	Clarification on Validation Report # 1455389	15 Apr 2013	n.a.
10.	GFA Certification	RESUMEN PUBLICO REPORTE DE AUDITORIA FSC, GFA-FM/CoC-002390	7 Oct 2014	n.a.
11.	PP	Plan de Manejo Maestro	Oct 2013	n.a.
12.	PP	Determinacatión de bosques con alto valor de conservatión, presentes en los proyectos de la empresa Puro Verde Paraiso Forestal S.A.	2014	n.a.
13.	Local Court Freiburg i.Brg	Commercial Registry BaumInvest Gmbh & Co KG	17 Jan 2008	n.a.
14.	Local Court Freiburg i.Brg	Commercial Registry BaumInvest II Gmbh & Co KG	04 Nov 2009	n.a.
15.	Municipalidad de Sarapiqui Direccion Finaciera y Tributaria	Certificacion de Estado Tributario Numero	06 Aug 2014	n.a.
16.	Caja Costarricense de Seguro Social	Constanica de no Patrono	05 Aug 2014	n.a.
17.	Registro Nacional Repbulica de Costa Rica	Constitucion de Sociedad Anonima	23 Sep 2009	n.a.
18.	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories	2006	n.a.
19.	IPCC	Good Practice Guidance for Land Use, Land-Use Change and Forestry	2003	n.a.
20.	Karenzel et al	Carbon storage of harvest-age teak (Tectona grandis) plantations, Panama	26 Dec 2001	n.a.
21.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Tectona_grandis	Accessed Oct 2014	n.a.
22.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Terminalia_amazonia	Accessed Oct 2014	n.a.
23.	Catie	Terminalia Amazonia; ecologia y silvicultura	2005	n.a.
24.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Calophyllum_brasiliense	Accessed Oct 2014	n.a.
25.	L.A. FOURNIER	Dipteryx panamensis (Pittier) Record & Mell	2009	n.a.
26.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Swietenia_macrophylla	Accessed	n.a.

Ref. No.	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information
			Oct 2014	
27.	Alvaro Redondo-Brenes et al	Growth, productivity, aboveground biomass, and carbon sequestration of pure and mixed native tree plantations in the Caribbean lowlands of Costa Rica	May 2006	n.a.
28.	Diego Perez et al	Stand growth scenarios for Tectona grandis planations in Costa Rica	Feb 2005	n.a.
29.	Montagnini F et al	Mixed plantations with native trees on abandoned pasture lands: restoring productivity, ecosystem properties and services in a humid tropical site. In: S. Günter, B. Stimm, M. Weber, R. Mosandl (eds.). Silviculture in the Tropics, pp. 501-n.a.511	2011	n.a.
30.	L.A. FOURNIER	Vochysia guatemalensis Donn. Sm.	2009	n.a.
31.	Fonseca, G.W. et al	models for biomass estimation in native forest tree plantations and secondary forests in the Costa Rican Caribbean Region. Bosque, 2009, vol. 30, n.1, pp. 36-47	2009	n.a.
32.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Hymenaea_courbaril	Accessed Oct 2014	n.a.
33.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Virola_koschnyi	Accessed Oct 2014	n.a.
34.	Alice, F. et al	Productividad en plantaciones puras y mixtas de especies forestales nativas en la estación biológica La Selva, Sarapiquí, Costa Rica (en línea). Revista agronomía costarricense. 28 (002): 61-71 p.	2004	n.a.
35.	Segura, M. et al	Allometric models for tree volume and total aboveground biomass in a tropical humid forest in Costa Rica. Biotropica. 37(1):2-8.	2005	n.a.
36.	Petit, B. et al	Growth in pure and mixed plantations of tree species used in reforesting rural areas of the humid region of Costa Rica, Central América. Forest Ecology and Management. 233:338-343.	2006	n.a.
37.	Reyes, G. et al	Wood densities of tropical tree species. United States Departmen of agriculture. Louisiana, US. 18 p.	1992	n.a.
38.	Avendaño Reyes, J.	Modelos Genéricos de Biomasa Aérea para Especies Forestales en Función de la Arquitectura y la ocupación del Rodal. Tesis M. Sc. Turrialba, CR. CATIE. 114 p.	2008	n.a.
39.	Oberbauer, S. et al	Growth analysis and successional status of Costa Rican rain forest trees. The New Phytologist. 104:517-521.	1986	n.a.
40.	Piotto, D.	Growth of native tree species planted in open pasture, young secondary forest and mature forest in humid tropical Costa Rica. Journal of Tropical Forest Science. 19(2): 92-102.	2007	n.a.

Ref. No.	Author/Editor/ Issuer	Title, Type of Document	Date	Additional Information
41.	Rodríguez Sanchéz, L. et al	Vochysia ferruginea Mart. In Tropical Trees Seed Manual, USDA Forest Service, Agriculture Handbook 721, October 2002. 775-777.	2002	n.a.
42.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Hyeronima_alchorneoides	Accessed Oct 2014	n.a.
43.	www.worldagroforestry.org	http://db.worldagroforestry.org/wd/species/Cedrela_odorata	Accessed Oct 2014	n.a.
44.	Greaves, A. et al	Cordia alliodora: a promising tree for tropical agroforestry. (1990) 43 pp. Tropical Forestry Papers no. 22. 37pp. Oxford Forestry Institute (OFI). Oxford, UK.	1990	n.a.
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