

EL ARRIERO VERIFICATION REPORT

2018

Document Prepared By ECOCERT SA

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Summary:

This report describes the verification audit of the El Arriero Afforestation on Degraded Grasslands under Extensive Grazing project. The Project establishes pine plantations on land previously under extensive grazing in Uruguay. The plantations will be managed on 22 – 25-year rotations for the purposes of producing high quality sawlogs. The purpose of the verification audit is to assess whether the Monitoring Report submitted for the period 26th March 2013 to 25 January 2018 conforms to the requirements of the VSCA and to assess whether the calculated number of VCUs is free of material error. The verification activities included document review and a site visit that included interviews and field reconnaissance. During the course of the verification audit 6 findings were raised. The issues raised in these findings were successfully resolved, resulting in their closure. The project complies with all

of the verification criteria, and the assessment team has no restrictions or uncertainties with respect to the compliance of the project with the verification criteria. The GHG reductions and removal enhancements claimed for the reporting period are free of material error.

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1. INTRODUCTION

1.1 Objective

The objective of the verification was to conduct an independent assessment of the El Arriero Afforestation of Degraded Grasslands under Extensive Grazing project to determine whether the quantification of GHG emissions reductions or removals for the period 26th March 2013 to 25th January, 2018 complies with the verification criteria as set out in the guidance documents listed in Section 1.2 of this report.

1.2 Scope and Criteria

In accordance with Section 4.3.4 of ISO 14064-3:2006, the scope was defined as follows:

- The project and its baseline scenarios;
- The physical infrastructure, activities, technologies and processes of the project;
- The GHG sources, sinks and/or reservoirs that are applicable to the project;
- The types of GHGs that are applicable to the project; and
- The reporting period, as discussed in Section 5 of this report.
- In accordance with Section 5.3.1 of the VCS Standard, the criteria for verification were the VCS Version 3 program documents, including the following:
 - VCS Program Guide
 - VCS Standard
 - VCS AFOLU Requirements
 - VCS AFOLU Non-Permanence Risk Tool

Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document. Ref 1, 9 to 15

The assessment was also performed against the CDM methodology, AR-ACM0001 "Afforestation and reforestation of degraded land" version 05.2.0, EB 65. Ref 13

1.3 Level of Assurance

In accordance with Section 5.3.1 of the VCS Standard, the level of assurance of this report is reasonable.

1.4 Summary Description of the Project

The project comprises a total of 4,731 ha of land previously under extensive grazing by beef cattle, on which afforestation for obtaining timber products and for stocking carbon dioxide from the atmosphere was established. The forests are to be managed on a 22 – 25 years rotation of loblolly pine and a hybrid pine.

2. VERIFICATION PROCESS

2.1 Method and Criteria

The verification was performed through document review, interviews with relevant staff and on-site inspections, as discussed in Sections 2.2 through 2.4 of this report. At all times, the project was assessed for conformance to the criteria described in Section 1.2 of this report. As discussed in Section 2.5, findings were issued to ensure that the project was in full conformance to all requirements.

Prior to the site inspections documented in Section 3.2 below, a sampling plan was assembled that highlighted the areas of highest risk of material error. These included the inventory and quantification procedures and land area determinations. A verification plan was constructed that took the sampling plan into account.

2.2 Document Review

The monitoring report and supporting documentation were carefully reviewed for conformance to the verification criteria. The verification was performed as an audit where the project description, monitoring report and any supporting documents were reviewed, cross checked and compared with identified and stated requirements. The description and accounts of this review are described in detail in the sections below.

In addition to the monitoring report, the following written documents were reviewed to ensure conformance of the project to the VCS rules and the methodology

Ref.	Title, Author(s), Version, Date	Electronic Filename
1	VCSA	AFOLU Requirements v3.6
2	Augustin Inthamassou	Arriero carbon stock calculation_11042018.xlsx
3	Augustin Inthamassou	Arriero carbon stock calculation_11042018.xlsx
4	Augustin Inthamassou	Arriero_boundaries11042018.kmz
5	Augustin Inthamassou	El Arriero-Non-Permanence-Risk-Report-Template-v3.2 11042018
6	Augustin Inthamassou	MONIT_REP_961_30APR2009_25MAR2013
7	Augustin Inthamassou	Monitoring Report El Arriero, v3.4_02042018
8	Carbosur	PROJ_DESC_961_11SEP2012
9	VCSA	VCS_Standard_v3.7
10	CDM-EB	ar-am-tool-02-v1
11	CDM-EB	ar-am-tool-08-v4.0.0
12	CDM-EB	ar-am-tool-12-v3.1
13	CDM-EB	EB75_repan30_AR-ACM0003_ver02.0
14	VCSA	VCS_Validation_Verification_Manual_v3.2
15	VCSA	AFOLU_Requirements_v3.6
16	Document	Land contract and ownership
17	Ministero Ambiente, Uruguay	Uruguay Forest Law
18	Carbosur	Financial Viability and Opportunity cost verification GFP2
19	Carbosur	Cash flow_Afforestation_60 years_SE and N
20	Carbosur	Stock de Carbono_El Arriero_exante
21	FSC	FSC certification El Arriero (fsc database)
22	Carbosur	Terms of Reference for second verification

2.3 Interviews

Interviews constituted an important component of the audit process. The following personnel associated with the project proponent and/or implementing partner were interviewed. The phrase “throughout audit” under “Date Interviewed” indicates that the individual in question was interviewed on multiple occasions throughout the audit process. The primary interviews for this verification audit were conducted during the office meeting described below. The verification team presented questions to the project development team. The questions were addressed by the most appropriate member of the project development team. In addition to the office meeting, the verification team maintained a continuing dialog via email and phone conversations with Carbosur throughout the audit.

Date	Name	Title / Role / Institution
Throughout audit	Agustin Inthamoussu	Carbosur Ltda.; Project development team leader
Opening meeting	Daniel Ramirez	Cambium Forestal Uruguay;
Throughout audit	Alejandro San Martin	Bosque Servicios Forestales
Opening meeting	Alvaro Pérez	Pike and Co

Table 1: List of staff interviewed

2.4 Site Inspections

A Site Inspection was conducted from April 17 to 18th, 2018. An office meeting was held in April 16th in the office of Carbosur, Ltda in Montevideo, Uruguay followed by visits to selected plantations on 17th and 18th of April and a closing meeting held on 20th of April at Carbosur’s Montevideo office. The objectives of the office visit were:

- To interview project personnel to gather information pertaining to project implementation and monitoring procedures;

- Discuss with project personnel issues that were raised by the verification team during review of project documents including the Monitoring Report;
- As certain whether any Methodology Deviations were implemented during the monitoring period; Interview project personnel to gather information pertaining to Project Description Deviations;

Review the inventory methodology, data processing procedures, and quantification methodologies employed during development of the monitoring report

The objectives of the field inspections performed were to:

- Select samples of data from on-the-ground measurements for verification in order to meet a reasonable level of assurance and to meet the materiality requirements of the project, as required by Section 5.1.3 of the VCS Standard;
- Perform a risk-based review of the project area and project activities to ensure that the project conformed to the requirements of the VCS rules and the methodology throughout the monitoring period; and ensure that monitoring was conducted in accordance with the requirements of the validated monitoring plan, the methodology employed and the VCS rules.

The parcels chosen were remeasured with the same material and same staff that at the monitoring event by Bosque Servicios Forestales and controlled by Ecocert team.

2.5 Resolution of Findings

Material discrepancies shall be resolved through the issuance of appropriate Corrective Action Requests.

A Corrective Action Request (CAR) is issued when a discrepancy with respect to a specific requirement is identified. This type of finding could only be closed upon receipt by ECOCERT of evidence of corrective actions taken in response to the issuance indicating that the identified discrepancy had been corrected. Resolution of all open CARs was a prerequisite for issuance of a verification statement.

Other types of findings issues are characterized as follows:

Clarification Request (CL): A CL signified a need for supplementary information in order to determine whether a material discrepancy existed with respect to a specific requirement. Receipt of a CL did not necessarily indicate that the project was not in compliance with a specific requirement. However, resolution of all open CLs was a prerequisite for issuance of a verification statement.

Forward Action Request (FAR): A FAR is issued to highlight issues related to the project's implementation that require review during the next verification audit of the project. A FAR may lead to direct non-conformances if not addressed.

Unlike CARs, FARs are not formally closed.

Following the conducted verification activities 6 CARs, 1 CL were identified. Following responses provided by project proponent, all findings issued by the audit team during the validation & verification process have to be closed. In accordance with Section 5.3.7 of the VCS Standard version 3, all findings issued during the verification process, and the impetus for their closure, are described in Sections 3 to 5 and Appendix I of this report.

A total of 7 findings were raised during the verification process: 6 NCRs, 1 CL

2.5.1 Forward Action Requests

No Forward Action Requests were issued.

2.6 Eligibility for Validation Activities

Not Applicable

3. VALIDATION FINDINGS

Not Applicable

3.1 Participation under Other GHG Programs

3.2 Methodology Deviations

3.3 Project Description Deviations

3.4 Grouped Project

4. VERIFICATION FINDINGS

4.1 Project Implementation Status

The project's implementation during the reporting period was consistent with the Project Description. Extensive evidence that vegetation management activities are being implemented as described in the PD, including pruning and thinning, was observed during field reconnaissance. The verification team confirmed that the Project remains certified under FSC by visiting the FSC web site and confirming that the certification status of Forestal El Arriero S.A. is "valid".

Forestal 'El Arriero SRL' first areas were planted in 2009 and the last ones in 2011. The project has recently completed its eight year. The forests had already had one thinning operation in the third year. Forest planted in year 2009 had already had two pruning operations, the first one at 3m height and the second at 5.5m height. Practically all forest plantations realized in 2010 had already had two pruning, the second at 5.5m height, the area that is not pruned at 5.5 m height had already been pruned at 3m. Forest planted in year 2011 had already had one pruning at 3m height.

The project implements a plan for routine monitoring of the project area for disturbance or damage wherein field crews engaged in operations planning or implementation report any such occurrences to the forest manager. Neither the methodology nor the VCS rules prescribe a fixed schedule for conducting forest Inventories. The forest inventory was conducted at the end of the current reporting period. The implemented monitoring system is thus suitable for obtaining, recording, compiling and analysing the monitored data and parameters.

It was demonstrated during validation, the project implementation does not and did not cause any displacement of activities. The only activity in the project area prior to the start date is extensive grazing by beef cattle, which continues to occur after project start.

The verification team confirms the implementation during on site visit.

The verification team visited and re-measured 4 randomly selected inventory plots during the field reconnaissance portion of the site visit. The verification team obtained printed maps and field data sheets for these plots to perform visual confirmation the accuracy of the mapping, to assess whether the plots could be relocated, to confirm that the inventory data for these plots were collected in accordance with the monitoring plan. The verification team found no discrepancies with respect to the mapping and was able to locate all of the selected sample plots. There no cases where plot data on the field data sheets were not consistent with the trees on the plot, an indication that the data management system is functioning adequately. The sampling intensity was sufficient to achieve a standard error of less than 10% of the estimated mean carbon stocks.

There was no evidence of bias or error with respect to the inventory measurements. The forest inventory measurements were taken by Bosque Servicios Forestales, a professional forestry consulting firm located in Montevideo, Uruguay.

As there is no emission trading system in Uruguay, the emission reductions and removals generated by the project have not become included in an emissions trading program or any other mechanism that included GHG allowance trading. As attested by Carbosur Ltda, the project has neither received nor sought any other form of environmental credit, nor has it been rejected by another GHG program.

The forest area of the project slightly changed from 5,377.0 ha in validation to 4,987.91 ha in the first verification and to 4,567 ha in the second verification. The difference is explained by the continuous upgrade of the project Geographical Information System, which resulted in the detection of some minor modifications. The reduction in the forest area was analyzed and is explained by two main reasons: the withdrawn of the farm "Obdulio" (129,16 ha) from the project (obligation from DINAMA to cancel the project in this farm) and due to minor corrections in the Geographical Information System.

The reduction in the forest area does not represents a reversal (according to the VCS document Program Definitions) or a catastrophic event, then the project participant did not communicate this to the VCS and monitored the loss. However Ecocert team emitted 2 Corrective actions Requests regarding the change of area:

The monitoring report shows changes in area due to external risk. However, the project proponent is asked to assess the external risk regarding the event in Obdulio and explain the reason of changes. (CAR 1).

The change of area in Obdulio is a consequence of the DIANAMA conservation project in the same area. The Project developer is asked also to integrate this factor in the external risk calculation and on its control on the zone. (CAR 2). The project proponent responded adequately to this request at the second round of correction.

The verification team can state after the field visit with a reasonable level of assurance that the project is being implemented as described in the monitoring report and that the monitoring system implemented is complete.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Under the terms of the methodology, changes in carbon stocks under the baseline scenario can be assumed to be zero. Therefore, project GHG emission reductions and removals are based on project actual carbon stocks. The carbon pool considered were: above-ground tree biomass, below-ground tree biomass, dead wood, litter, and soil organic carbon.

Carbon in above and below ground tree biomass is calculated using the CDM tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” Ref 12, as described in the project description. Forest inventory data including dbh and a sample of tree heights were collected as described in the monitoring report. Tree volume was calculated by applying a Tree Shape Factor to the volume of a cylinder calculated from dbh and tree height. The appropriateness of the volume calculation method and TSR were demonstrated based on the tool “Demonstrating appropriateness of volume equations for estimation of aboveground tree biomass in A/R CDM project activities”. Volume was converted to biomass using the appropriate wood density and age-specific BEF factors that were approved at validation. Below ground biomass was estimated by applying root-to-shoot ratios calculated using the default procedure specified in the tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities”, as approved at validation. Biomass of individual trees was summed to plot level, then to strata level. Strata level carbon stocks were weighted by area and summed. Biomass in dead wood and litter was calculated by applying the default percentages described in Section 3.3.4 of this report to the live tree biomass estimates.

Default values from Table 3 of the “tool for estimation of change in soil organic carbon due to the implementation of A/R CDM project activities” were adequate and applied to the soil strata.

The project developer applied a value of 0.7 for the relative stock change factor. This value is appropriate since the lands are degraded lands using the “Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities”.

The verification team reviewed the calculation workbook (Ref 2 and 3) used to calculate project carbon stocks and found the spreadsheet formulae, conversions, and aggregations were performed in accordance with the requirements of the respective tools, and that the data and parameters were applied consistently. The methods and formulae used are consistent with the project description except for the project description deviations that have been identified.

The verification team emitted a Corrective action request on the volume of VCUs resulting to a wrong column calculation in Equation 10 of the excel carbon calculation (Ref 2 and 3). (CAR 5).

This was corrected in a good manner at the second round of Corrective action response.

Baseline carbon stocks and leakage, are assumed to be zero, as allowed by the methodology and assessed at validation. Under the applicability conditions of the methodology only activity displacement leakage can occur, being the displacement of agricultural activities, which for the Project is cattle grazing. Under the methodology and associated tools, if displacement of cattle resulting from implementation of project activities would be onto lands that are considered degraded or degrading, then leakage can be assumed to be zero.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The GHG removals for the project reporting period are based on forest inventory measurements and calculation procedures and factors that have been assessed by the verification team, as described in Section 4.2 of this report. The verification team has attained a reasonable level of

assurance that these measurements and procedures, including the internal quality control measures such as check plots, were designed and have been implemented to the highest level of quality. The project proponent has enlisted 3 professional forestry consulting companies in the development of the project: Carbosur Ltda in development of the VCS project and the carbon offset calculations; Cambium Forestal Uruguay S.A. to plan and manage forestry operations including land acquisition, selection of planting stock, silvicultural treatments, etc.; and Bosques Servicios to collect and process the forest inventory data. The verification team interviewed personnel from these firms relevant to the project and confirmed their qualifications and expertise.

The verification team conducted a risk based sampling of the field inventory plots and data management systems to assess the reliability of the evidence, and the source and nature of the evidence for the determination of GHG removals. Forest inventory measurement data were transferred to electronic spreadsheets for analysis.

Ecocert team emitted the CAR 4 regarding the old version of the terms and reference describing all procedures for the monitoring:

Quality control procedures from the terms and References to hire Bosque Servicios Forestales are missing. The monitoring plan suggests the terms of reference for contracting Bosque Servicios Forestales to perform the monitoring. However, the terms of Reference shown was not updated. The Project Proponent is asked to provide The Terms of Reference corresponding to the second monitoring event.

The verification team reprocessed the calculation from tree measurement data to the GHG removal estimate and the calculations regarding the GHG removals reported in the monitoring report were reviewed.

The project relies on monitoring conducted by field crews and inventory data collected by inventory field crews (Table 1) and the frequency of calibration of monitoring equipment was also checked especially in inhomogeneous plantations (high tree height difference)

The verification team found, with a reasonable level of assurance that the evidence used to determine GHG removals is of sufficient quantity and appropriate quality.

However, the QAQC procedure of data control from Pike and CO on 10% samples of the entire permanent plots was not transmitted.

Ecocert team emitted the CAR 4. The Project Proponent states in the QA/QC procedure that 10% of the sampling plots were remeasured to check the quality of the inventory. However, no evidence of the remeasurement was found. The project proponent is asked to produce proof of the QAQC control procedure as stated in the Monitoring report (CAR 3). The project proponent answered to this corrective action after the draft report was emitted.

4.4 Non-Permanence Risk Analysis

The verification team reviewed the Non-Permanence Risk Assessment provided at project verification and emitted the CAR 2. After responding to this corrective action, Ecocert states there has been no change regarding the status or applicability of any of the risk factors since project validation, including political factors, socio-economic factors, environmental factors, or factors relating to implementation of project activities. The verification team therefore concludes that the default minimum 10% risk rating is appropriate for the current reporting period.

Please see Appendix 2 for a detailed description of the steps taken to assess the non-permanence risk rating determined by the project proponent.

5. SAFEGUARDS

5.1 No net harm

Forestal 'El Arriero SRL' afforestation on degraded grasslands under extensive grazing does not cause negative environmental and socio-economic impacts (Ref.21). The FSC Forest Management certification guarantees a high quality on environment and economic sides.

5.2 Local Stakeholder Consultation

Forestal 'El Arriero SRL' afforestation on degraded grasslands under extensive grazing does not follow a formal process for local stakeholder communication as there were no comments from stakeholders at validation process. The farmers are very few away from the plantation and benefit of the good use of the land for a rotation and management of grazing area for their livestock.

6. VERIFICATION CONCLUSION

The verification team has a reasonable level of assurance that the project and the GHG emission removals for the reporting period comply with the verification criteria set out in VCS Version 3. The project has been implemented in accordance with the project description, except for project description deviations which have been adequately described and determined by the verification team to be valid.

The verification team finds that the GHG removals in the amount of 1,226,304 tonnes, CO₂ equivalent, for the current reporting period are calculated in accordance with the requirements of the methodology and the VCS rules and are free of material error.

Verified GHG emission reductions and removals in the above verification period:

The VCS Registration and Issuance Process v3.5 Procedural Document, Section 4.1.7 shows the breakdown of VCUs into individual vintages within a verification period. Therefore the tradable

VCUs and Buffer pool contribution are calculated against the Total Net GHG emission removals for the monitoring period.as follows:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2013	0	254,843	0	254,843
2014..	0	197,228	0	197,228
2015	0	302,636	0	302,636
2016	0	259,485	0	259,485
2017	0	212,112	0	212,112
Total		1,226,304	0	1,226,304

7. APPENDIX 1: LIST OF FINDINGS

CORRECTIVE ACTION REQUESTS

CAR 1 dated 04/18: Monitoring Plan 2.2
Finding: The monitoring report shows changes in area, however please provide the verification team with a map showing the old project boundary and the new project boundary.
Timeline for Conformance: Prior to verification
Client Response dated 08/2018 The project participant noticed the modification of the area in the first monitoring event. The difference in the area at the moment of the first verification, in relation to the validation is explained in the monitoring report of the first verification: http://vcsprojectdatabase.org/#/project_details/961 In that verification the total area of Arriero changed from 5,377 ha to 4,987.91 ha. In this second verification the area was updated and finalized in 4,567. A shapefile and kml file of the first and second verification is presented to show the differences between.
ECOCERT Assessment of PP responses: The project proponent is satisfactory regarding the change of boundaries.
Status: Closed

CAR 2 dated 04/18: VCS Monitoring plan 2.2 and Non permanence risk report
The monitoring report shows changes in area due to external risk. However the project proponent is asked to assess the external risk regarding the event in Obdulio and explain the reason of changes.
Timeline for Conformance: Prior to verification
Client Response dated 08/2018 <u>Introduction</u> In the year 2000, and after a long process of national debate, the Law N° 17.234 ¹ was enacted, declaring of "general interest" the creation of a SNAP (National System of Protected Areas). The law is also a fundamental tool for the planning and management of protected areas. This Law is part of the Convention on Biological Diversity ratified by Uruguay in 1993 through Law No. 16,408 and the General Law of Environmental Protection (No. 17,283). Previously, the management of the protected areas had been in the hands of the Ministry of Livestock, Agriculture and Fisheries (MGAP), the Ministry of National Defense (MDN), the Ministry of Housing, Land Management and Environment (MVOTMA) itself and some local government. Law N° 17.234 assigns the role of national regulator of the System to MVOTMA, while maintaining the possibility of managing protected areas to different public, private or social institutions; national, departmental or local. After the approval of Law N° 17,234, the Regulatory Decree is approved in February 2005 (Decree 52/005 ²).

¹ <http://www.impo.com.uy/bases/leyes/17234-2000>

² <http://www.impo.com.uy/bases/decretos/52-2005>

Reason of elimination

The DINAMA has the authority to request modifications to productive ventures that jeopardize the protected areas in SNAP.

The DINAMA requested El Arriero to restitute the area of the project because it is located in the buffer area of “Quebrada de los Cuervos”. A decision that is considered historical in environmental matters for the country, the ministry of the branch determined that the company must repair the damage and return the land as it was found in 2008³.

The main problem was that El Arriero requested the permission for plantation at DINAMA once the forest established, and before having their approval, but of course having the approval from the Forestry Department. The DINAMA did not approve the project, but since the project was implemented, then the project developer was forced to restitute the land.

Future risk

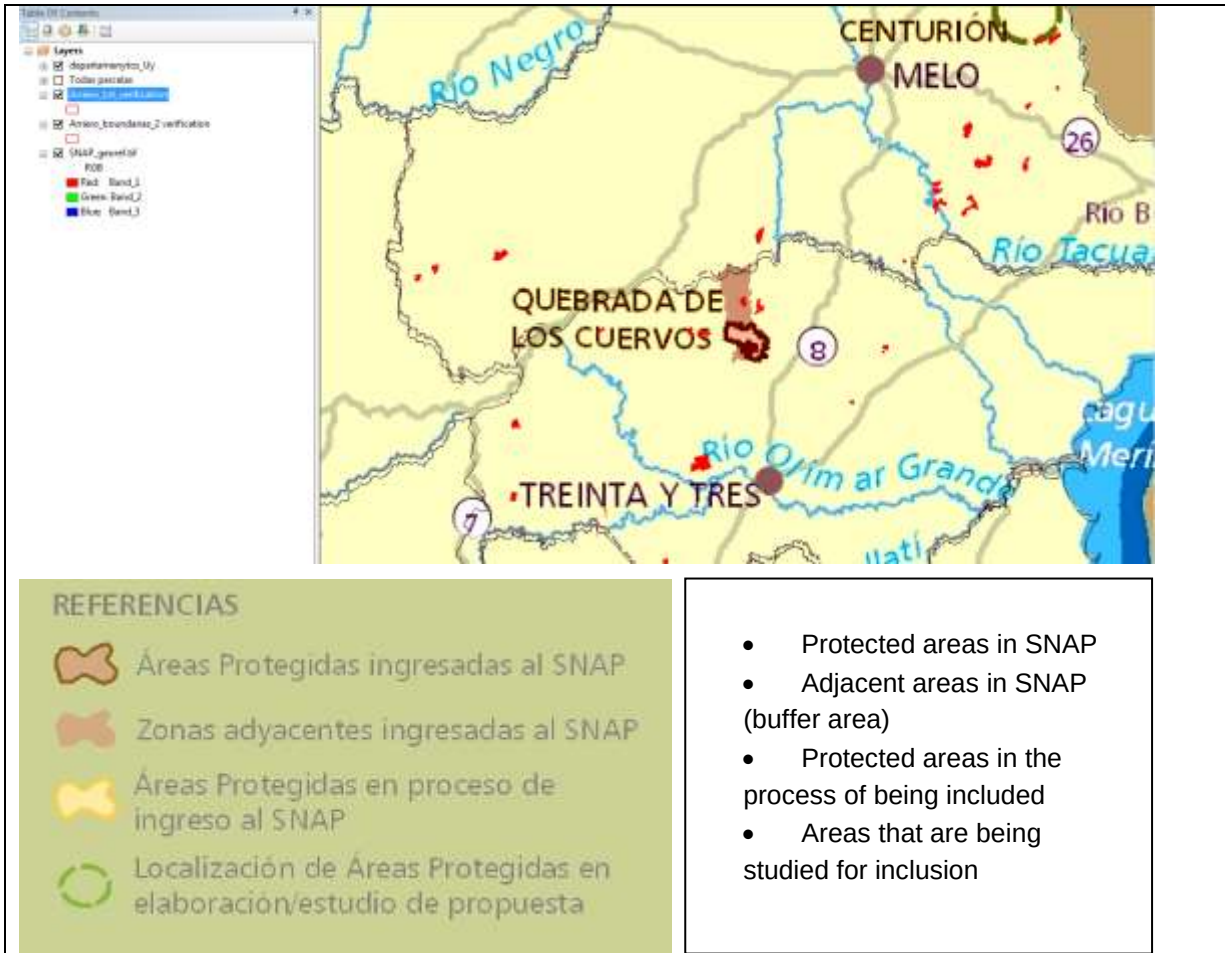
The SNAP includes certain areas with ecological value⁴. The following map shows the exact places of these areas.



The same map is georeferenced and overlapped to the project boundaries. The image below shows the project boundaries at the moment of the first verification. There is a small red dot in the buffer zone of “Quebrada de los Cuervos” which is the farm Obdulio.

³ <https://brecha.com.uy/son-de-palo/>

⁴ <http://www.mvotma.gub.uy/portal/areas-protégidas.html>



The same is shown again, but in this case, the project boundaries for the first verification is inactivated and only the project boundaries for the second verification (actual) are shown.



Note that Obdulio in the buffer zone of “Quebarada de los Cuervos” is not included in the project boundaries.

In conclusion, the different maps show that there is no other farm (red polygons) in any protected

area or buffer zone. Moreover, all the farms have the DINAMA approval and will never be forced to eliminate the activity.

ECOCERT Assessment of PP responses:

Status: Closed

CAR 3 dated 04/18: Monitoring Report 3.2 Terms of Reference

The monitoring plan suggests the terms of reference for contracting Bosque Servicios Forestales to perform the monitoring. However, the terms of Reference shown was not updated.

The Project Proponent is asked to provide The Terms of Reference corresponding to the second monitoring event.

Timeline for Conformance: Prior to verification

Client Response dated 08/2018

The Terms of Reference are provided in a separate document called "TdR for second verification El Arriero" Ref 22

ECOCERT Assessment of PP responses: The documents requested were provided by the project proponent and correspond to the monitoring plan.

Status: Closed

CAR 4 dated 04/18: Monitoring Report 3.2 Data and parameter monitored

The Project Proponent states in the QA/QC procedure that 10% of the sampling plots were remeasured to check the quality of the inventory.

However, no evidence of the remeasurement was found.

The project proponent is asked to produce proof of the QAQC control procedure as stated in the Monitoring report.

Timeline for Conformance: Prior to verification

Client Response dated 08/2018:

An Excel sheet is being provided with the raw data (sheet "datos") from the field done by Pike Forestal. In the sheet "comparación" this data is processed and compared to the field data from Bosque Servicios Forestales. Bosque Servicios forestales raw data is provided in the Excel Sheet "Arriero Carbon Stock calculation 24072018".

ECOCERT Assessment of PP responses: The new excel sheet is correct and has been provided to Ecocert

Status: Closed

CAR 5 dated 04/18: Monitoring report Tables 6 and 7

The project proponent stated 1,721,344 VCUs. However, there is an error in the above ground biomass calculated in the calculations sheet. The project proponent is asked to correct the formula: $b_{tree\ i,t} / ha$ (mean tree biomass per hectare in stratum i) to resolve this finding and update the monitoring report adequately
Timeline for Conformance: Prior to verification
Client Response dated 08/2018: The Monitoring Report is amended and aligned with “Arriero Carbon stock calculation 24072018”.
ECOCERT Assessment of PP responses: The monitoring has been transmitted and corrected.
Status: Closed

CAR 6 dated 04/18: Monitoring report Front Page
The project proponent is asked to fill all the information on the front page of the monitoring report.
Timeline for Conformance: Prior to verification
Client Response dated 08/2018: The Monitoring Report is amended in version 24072018
ECOCERT Assessment of PP responses: The monitoring report has been corrected in the new version
Status: Closed

CLARIFICATION REQUESTS

CL1 dated 04/18: Monitoring report section 4.4
The project proponent shows vintage years for the tradable VCUs. However, the project proponent is asked to clarify the calculation of the breakdown of vintages for the years following the first verification event.
Timeline for Clarification: Prior to verification
Client Response: This is because the same model was used as the one used in the validation to estimate the long term average. The methodology for the estimation is presented in the Excel sheet: “Arriero carbon stock calculation 24072018.xls” in the sheet “4.Vintages”:
ECOCERT Assessment of PP responses:
Status: Closed

8. APPENDIX 2: NON PERMANENCE RISK ANALYSIS

1 INTERNAL RISK

Project management				Ok, Experience was demonstrated
Risk Factor	Risk Factor and/or Mitigation Description	Ok, Experience was demonstrated	Ecocert's comments	
a)	Species planted are proven to be adapted to the same agro-ecological zone. The proposed project activity used mostly Loblolly Pine (<i>Pinus taeda</i>) and, to a lesser extent, a Hybrid Pine–Caribea and Elloitti (in low areas). None of the species are native to the area. The choice of species was due primarily to the fact that they ensure an adequate productivity level and a market access for the products to be obtained, which would not be possible if other species had been used. On the other hand, they originate in regions which extend through twelve southern states of USA with ecological conditions highly similar to those in Uruguay. This similarity of weather conditions between Uruguay and Loblolly pine place of origin explains why this species adapted so well to local conditions, where it has been successfully grown and bred for many years. <i>P. taeda</i> started to be spread in 1960s (Morey and Porcile). Currently this tree species is one of the most widely planted in Uruguay, representing approximately 26% (256,943 ha) of commercial plantations according to 'Dirección General Forestal'. In addition, this species has been successfully planted and is satisfactorily growing in El Arriero project site since 2009, there were no soil or weather adaptation problems which could be seen during project start day.	Ok, Experience was demonstrated	Ok	
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued. This is the first time GHG credits will be emitted by this project.	Ok, Experience was demonstrated		

c)	Management team includes individuals with significant experience in all skills necessary to successfully undertake all project activities All activities related to forest investments of 'Forestal El Arriero S.A.' are implemented by 'Cambium Forestal Uruguay S.A.'. 'Cambium Forestal Uruguay S.A.' is a Chilean-originated company dedicated to the management of forestry assets. It has an office in Uruguay. It recognizes the following as fundamental in the development of each and every one of its operations: • Make a professional and efficient forest management, which adds value to the company and the assets managed by it, and improve the profitability of the investments of its customers. • Comply with applicable laws, both general and social, environmental and security. 'Cambium Forestal Uruguay S.A.' has 28 employees in Chile and 30 in Uruguay, providing services in both countries. 'Cambium Forestal Uruguay S.A.' also provides international consulting services in countries as Argentina, Brazil, South Africa, New Zealand, USA and Australia. 'Cambium Forestal Uruguay S.A.' is the forestry operator of Global Forests Partners Ltd. (GFP) in Chile and Uruguay. GFP is an American company that structures and manages forestry investments on behalf of Institutional Investors. 'Cambium Forestal Uruguay S.A.' is organized under the following structure:	Ok, Experience was demonstrated	Ok CVs and experience are corresponding to the description in this section	
d)	The management team is based in Uruguay and is located within 5 hours of travel to all areas of the project site All the management team is based in Uruguay. The headquarters are in Montevideo, and the majority of the staff members are located in the project sites. All project areas can be reached by good condition roads with a travel time of not more than 5 hours from Montevideo, which would be the maximum distance to be traveled by any staff member.	Ok, Experience was demonstrated		

e)	The management team includes Carbosur, a climate change consultancy company with more than 12-year experience in carbon projects in the forestry and other sectors Carbosur has been hired by 'Forestal <i>El Arriero S.A.</i>' as the contractor in charge of managing all aspects related to VCS registration, project validation, monitoring and verification. Carbosur has experience with VCS forest projects, having effectively registered six afforestation projects under the VCS. In addition, Carbosur has vast experience with the CDM and VCS, having successfully led the registration of one A/R CDM project (#3845), and having contributed significantly to the development of the first consolidated methodology for A/R CDM projects (ARACM0001), which is the one used for 'Forestal <i>El Arriero S.A.</i>' project. Carbosur also proposed to the A/R Working Group of the CDM a tool for accounting soil organic carbon in A/R CDM projects, which was later approved,	-2	Ok, Experience was demonstrated
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	with modifications, by the CDM Executive Board, and is also used in 'Forestal <i>El Arriero</i> S.A.' project. Carbosur has also led the registration of twelve CDM projects. Carbosur has also contributed to the development of VCS Guidelines for AFOLU projects released in 2008, and has also experience with the issuance of VCUs (Fray Bentos Biomass Power Project, issued in 2008). Carbosur also contributed with several comments to the non-permanence risk tool (used for the Validation Non Permanence Risk Report), which were taken into consideration by the VCS. Finally, Carbosur has developed the REDD Strategy of Uruguay.		
f)	Adaptive management plan is in place 'Forestal <i>El Arriero</i> S.A.' forest plantations are constantly monitored. The company considers that for having a successful health monitoring, the first step is the early identification of problems. Monitoring by means of permanent plots and reports of trained field staff is what makes possible early detection of potential pests and diseases as well as nutrient deficiencies. Biomass loss events (both biotic and abiotic) can be immediately detected through the continuous presence of experts in the forests and through the various systematic procedures in place. In addition, the event is registered in a brief document with the purpose of collecting information to prevent the replication of the conditions that caused the pest attacks or plant diseases. Health monitoring reports includes the surveillance of <i>Fusarium circinatum</i> and <i>Sirex noctilio</i>. In addition, 'Forestal <i>El Arriero</i> S.A.' forest plantations also belong to a group of monitored fields supervised by INIA (public-private entity of Uruguayan National Investigation Institute on Agriculture), "Facultad de Agronomía" (Forest Department research area of the public University) and "Sociedad de Productores Forestales" (Research area of Uruguayan Forest Producers Union). The program consists in the monitoring of plagues in all national territory. Monitoring reports are not yet available; the INIA has not yet published any. In 2007, 'Cambium Forestal Uruguay S.A.' initiated contacts with other forestry companies present in the area of interest for the purpose of bringing them together and organized a forest fire protection plan. The main objective of this partnership is to increase the prevention capabilities, improve detection and firefighting and to integrate existing resources into a single technical plan protection. A second objective is to reduce the cost of protecting all participating companies. The Group is organized into 11 sub-areas or blocks of protection, in each of which is defined detection resources, surveillance and combat, according to the plantation area, and territorial concentration. PAIF funding is done among the companies, see the following video: http://www.youtube.com/watch?v=lw-hv8MV6F4.	-2	The monitoring is constantly performed by El arriero to control the future volume of wood
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-4	

Total may be less than zero.	
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Financial Viability			
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating	
a)	Project cash flow breakeven point is greater than 10 years (20 years). The project cash flow prepared for validation has changed in the last few years and the breakeven point is even greater than 20 years. In Uruguay the cost of living in Uruguayan pesos increased more than 86% (accumulated PCI since 20 (project start date - 2017, see: http://www.ine.gub.uy/c/document_library/get_file?uuid=361cf1e4-7d00-416a-960b-d618a0b7d7e8&groupId=10181) and labor union negotiations transferred the inflation to logistic and labor costs. The exportation price for pine sawlogs or boards have been stable since 2011 and the exchange rate (Uruguayan pesos per dollar) in real terms have been stable through the time.	3	OK The cashflow was checked and didn't change since 1st verification
b)	Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment	Not applicable	
c)	Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment	Not applicable	
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment	Not applicable	
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	Not applicable	
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	Not applicable	
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	Not applicable	
h)	Project has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. Total cost of purchased land and plantation costs represented more that 80% over the accumulated cash out in 'El Arriero' afforestation cash flows. Spreadsheet with cash flow analysis will be available during verification process.	0	

i)	Project had available as callable financial resources more 50% of total cash out before project reaches breakeven. Balance sheet was available for the validation team and will be available for the verification team	-2	Cashflow excel file was checked
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		1	

Opportunity Cost

Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating	
a)	N/A	0	
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities. It was demonstrated in the PD that the baseline scenario (extensive beef cattle production) is the only possible alternative land use activity within 'Forestal El Arriero S.A.' project boundaries. The IRR of this activity at the start of the project activity was less than half of the expected IRR for the project activity. The current critical situation of the forestry sector made change the IRR, the IRR of the most profitable alternative land use activity is 70% more than the project activity (please, see attached worksheet).	6	Ok
c)	N/A	0	
d)	N/A	0	
e)	N/A	0	
f)	N/A	0	
g)	N/A	0	
h)	N/A	0	
i)	N/A	0	
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may be less than 0.		6	

Project Longevity

a)	Uruguay offers both excellent natural conditions and a very good regulatory framework for the development of forest plantations. Because of this, the country has attracted very important investments in the forestry sector, mostly by foreign capital, in a process that started after the implementation of a specific policy by the Uruguayan government concurred with a very favourable international situation in the late 1980's and early 1990's. There is an important presence of leading global wood products companies in the country. 'Forestal <i>El Arriero</i> S.A.' is the project proponent and the owner with full property rights of the project land, as demonstrated by the notarial certificates available to the validation team. All lands are legally registered in the National Directorate of Land Registry. A notarial deed of incorporation of the companies 'Forestal <i>El Arriero</i> S.A.' was also made available to validation team. The proof of title will be maintained for the entire project longevity. All the project properties are covered by management plans, as stated in	24-(120/5)=0 Proof of land checked
	the project documents submitted to Uruguayan government and have not been modified since submission. Ecology and nature conservation are two of the company's most important pillars when making investments in timber. Therefore, all properties are certified by Forest Stewardship Council, which ensures the forest management sustainability. One of the main aims of the certification is to guarantee the long term commitment of the company. The sale of land or the conversion of forest to other land uses were not considered as possible sources of income, and it is assumed that the project will continue to operate indefinitely over time. Thus, the project longevity was established in 120 years.	
b)		
Total Project Longevity (PL) May not be less than zero		

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	3

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts	
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Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating	
a)	Ownership and resource access/use right are held by the same entity. 'Forestal El Arriero S.A.' holds full property rights on the land and there are absolutely no disputes over the tenure or use of the land. There are no indigenous groups in Uruguay in general, or in the areas where the project lands are located, in particular. There are no sites of interest to local communities within the premises of the company.	0	Ok checked For full property rights
b)	Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession)	Not applicable	
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	Not applicable	
d)	There exist disputes over access/use rights (or overlapping rights)	Not applicable	
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively	Not applicable	
	mitigating such impacts.		
f)	Mitigation: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period	Not applicable	
g)	Mitigation: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims	Not applicable	
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.		0	CAR 2 closed

Community Engagement			
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating	
a)	Local population are not reliant on the project area, the risk is not relevant to the project.	0	
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted	Not applicable	
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	Not applicable	

Total Community Engagement (CE) [where applicable, (a + b + c)] Total may be less than zero.	0	
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Political Risk			
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating	
a)	Governance score of less than -0.79	Not applicable	
b)	Governance score of -0.79 to less than -0.32	Not applicable	
c)	Governance score of -0.32 to less than 0.19	Not applicable	
d)	Governance score of 0.32 and 0.77	Not applicable	
e)	Governance score estimation, according to the World Bank Institute Worldwide Governance Indicators is 0.84. The worksheet used to estimate the value will be available for the verification team.	1	Ok, checked on worldbank website

f)	Mitigation: 1) Uruguay has received REDD+ Readiness funding from the World Bank Forest Carbon Partnership Facility and is implementing a REDD+ policy framework covering key components such as GHG credit ownership, clear government authority over REDD+ projects, and/or national measurement, reporting and verification systems. 2) Uruguay has an established national PEFC standard body, which is PEFC URUGUAY 3) Uruguay has an established Designated National Authority under the CDM (http://cdm.unfccc.int/DNA/index.html?click=dna_forum) and has one registered CDM Afforestation/Reforestation project (http://cdm.unfccc.int/Projects/DB/BVQI1278956093.58/view)	-2	Ok, checked on cdm website
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.		0	

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero.	0

3 NATURAL RISKS

Explain the significance and likelihood of the natural risk and any mitigation activities implemented, (copy table for each natural risk).

Natural Risk (Fire)	
Significance	Insignificant (less than 5% loss of carbon stocks)
Likelihood	Less than 10 years
Score (LS)	2 Conservative approach has been applied considering the in-existent forest fires in the area. There are no updated official data provided by National Emergency System (Presidency of the Republic) as previously done. It was conservatively assumed a significance of "less than 5%" and likelihood was "less than 10 years". Combination of both, results in a score of 2.

Mitigation	0.25 Mitigation of risks factor are applied, prevention measures were described in the "Protection Plan Against Forest Fires" (archived as part of the project documentation). In addition, 'Cambio Forestal Uruguay S.A.' has proven history of effectively containing a forest fire in 2011 and is part of the PAIF group, see section 1 "Project Management", item f.
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Natural Risk (Pest and Disease outbreaks)	
Significance	Minor (5% to less than 25% loss of carbon stocks)
Likelihood	Every 50 to less than 100
Score (LS)	1 <i>Pinus taeda</i>, one of the most planted pine species in Uruguay, is well known to be susceptible to a pest (<i>Sirex noctilio</i>) in Uruguay's growing conditions. There is no documentation of historical events that occurred specifically in <i>Pinus taeda</i> plantations. In spite of this, Morey and Porcile¹ (who conducted a thorough historical analysis of pest and disease events in Uruguay for all types of forest plantations) concluded that there were few incidents or losses in generous Pine: • 1910: appearance of <i>Pissodes notatus</i> in pines at the coast of Maldonado department. It was declares plague in 1921. –Significance: 0% • 1955/56: First detections of <i>Rhyacionia buoliana</i> in Soriano and Canelones department. –Significance: 0% • 1962: <i>Pissodes</i> attacked plantations in San Gregorio –Significance: 5% • 1980: First appearance of <i>Sirex noctilio</i> –Significance: 0% • 1981: <i>Rhyacionia</i> attacked young <i>P.taeda</i> plantations–Significance: 0% • 1983: Severe attacks of <i>Sirex noctilio</i> (declares plague in 1985) – Significance: 10% Currently, other new diseases could be found (<i>Fusarium circinatum</i>) or new pests such as bark beetles. Damages due to these agents are considered insignificant. Considering the information presented above and the relatively low level of information available at the National or local level, a conservative approach has been applied. The risk of pest and disease outbreak is assumed most significant event (selected value is 10%); and with likelihood of every 50 to less than 100 years.

Mitigation	0.5 In 1995 the Uruguayan Government signed and became part of the Montreal Process which involved the adoption of several indicators and criteria related to the Sustainable Forest Management. Third criterion refers specifically to the Maintenance of Health and Vitality of Forest Ecosystems. Uruguay has freely committed to periodically evaluate the evolution of the forest health in time and space as well as to maintain it. When referring specifically to 'Forestal El Arriero S.A.', the same procedures were applied within the entire project boundaries: a continuous forest inventory has been implemented, which monitors and assessed –among several variables –the
	actual health of plantations in order to detect in advance any disease spread or
	plagues attack. The person in charge of project management visiting the project plantations to monitor the health status and observe the possible appearance of pest and disease agents on an almost daily basis. There are no registries of any appearance of pests diseases agents since El Arriero implementation.

Natural Risk (Extreme Weather)	
Significance	Insignificant (less than 5% loss of carbon stock) and transient (full recovery of lost carbon stocks expected within 10 years of any event)
Likelihood	Every 10 to less than every 25 years

(LS)	1 According to Morey and Porcile, there were 12 extreme weather events during the last 140 years (study done at a National level). Most of them were droughts but also some flood events took place: • 1869/70: Severe drought • 1877/79: drought • 1891/1893: drought • 1903: drought and harvest losses in agriculture fields • 1906/08: drought and lobster invasion (incidence in crops) • 1914: floods • 1915/16: drought and lobster invasion (incidence in crops) • 1942: drought • 1959: floods • 1964/1965: drought • 1988/89: severe drought • 1997/98: severe drought • 2005: severe wind storm • 2009/2010: drought Some other events were also registered by the Emergency System (Presidency of the Republic)²: • 10/10/2007: storm, wind and heavy rains. Fallen trees and roofs blown: http://www.elpais.com.uy/07/10/11/pciuda_307507.asp • 17/11/2010: Wind and heavy rain, hail. Plantations affected: http://climacanelonesuruguay.blogspot.com/p/tiempo-severo-en-uruguay.html The severity of these events was not measured for the particular case of forests. The only weather condition that directly affected the forest sector was the 2005 wind storm. However, there is no information available on its impacts, which were mostly localized in several spots in the South of the country.
Mitigation	0.5. There are no registries of any extreme weather event since El Arriero implementation

Natural Risk (Geological risk)	
Significance	No loss

Likelihood	Risk associated to earthquakes and volcanoes are not applicable to the project area since no such activities have occurred during the last 100 years in Uruguay. According to CERESIS (Regional Center for Seismology for South America – acronyms in Spanish), there were no earthquakes in the project activity region in the last 100 years (http://www.ceresis.org/ceresis/consulta.htm). In relation to volcanoes, the book <i>Physical Geography</i>, developed by Mcknight, T., Hess, D. (2008) demonstrates that distribution of such geological events are associated to tectonic plates boundaries (Mcknight, T., Hess, D., 2008). The location of the project activity and the whole of Uruguayan territory are far from any plate edge.
Score (LS)	0
Mitigation	Not applicable

Ecocert team checked all the information available and states that there were no new natural risk to integrate in the evaluation since the first verification.

Score for each natural risk applicable to the project (Determined by (LS × M))	
Fire (F)	0.5
Pest and Disease Outbreaks (PD)	0.5
Extreme Weather (W)	0.5
Geological Risk (G)	0
Other natural risk (ON)	0
Total Natural Risk (as applicable, F + PD + W + G + ON)	1.5

OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

3.1 Overall Risk Rating

Risk Category	Rating
a) Internal Risk	3
b) External Risk	0
c) Natural Risk	1.5
Overall Risk Rating (a + b + c)	4.5