

VCS VERIFICATION OF PROJECT “LOWER ZAMBEZI REDD+ PROJECT”



Document Prepared By
DNV Climate Change Services AS

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the project activity “Lower Zambezi REDD+ Project” in Zambia for the period 1 October 2009 to 1 October 2013.

Verification is the periodic independent review and *ex post* determination by a Validation/Verification Body (VVB) of the monitored reductions in GHG emissions that have occurred as a result of the project activity during a defined monitoring period. The objective of this verification was to verify the emission reductions reported for the project activity “Lower Zambezi REDD+ Project” for the period 1 October 2009 to 1 October 2013.

The project proponent is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

DNV conducted the verification on the basis of the baseline and monitoring methodology VM0009 (version 2.1) “Methodology for avoided deforestation”, the monitoring plan contained in the project description (PD), version 1.2 dated 19 February 2014 and the monitoring report (version 1) dated 2 December 2013. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV’s verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

During the course of verification, DNV has raised 4 Corrective Action Requests and no requests for Clarifications. The project proponent has addressed these findings to DNV’s satisfaction.

In our opinion the GHG emissions reductions reported for the project activity for the period 1 October 2009 to 1 October 2013 are fairly stated in the monitoring report (version 2.1) dated 19 February 2014.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology VM0009 (version 2.1) and the monitoring plan contained in the project description (version 1.2 of 19 February 2014).

DNV Climate Change Services AS was able to verify that the emission reductions from the project activity “Lower Zambezi REDD+ Project” in Zambia during the period 1 October 2009 to 1 October 2013 amount to 488 081 tonnes of CO₂ equivalent.

The vintage of emission reductions is as follows:

2009 (1 October 2009 to 31 December 2009)	30 756 tonnes of CO ₂ equivalent
2010 (1 January 2010 to 31 December 2010)	122 020 tonnes of CO ₂ equivalent
2011 (1 January 2011 to 31 December 2011)	122 020 tonnes of CO ₂ equivalent
2012 (1 January 2012 to 31 December 2012)	122 355 tonnes of CO ₂ equivalent
2013 (1 January 2013 to 1 October 2013)	90 930 tonnes of CO ₂ equivalent

DNV does not assume any responsibility towards the issuance and utilization of the VCUs hereby

verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification was based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

Table of Contents

1	Introduction	6
1.1	Objective	6
1.2	Scope and Criteria	6
1.3	Level of Assurance	6
1.4	Summary Description of the Project	6
2	Verification Process	7
2.1	Method and Criteria	7
2.2	Document Review.....	8
2.3	Interviews.....	9
2.4	Site Inspections	14
2.5	Resolution of Findings	15
2.6	Eligibility for Validation Activities	16
3	Validation Findings.....	16
4	Verification Findings.....	16
4.1	Project Implementation Status.....	16
4.2	Accuracy of GHG Emission Reduction and Removal Calculations.....	17
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals.....	21
4.4	Non-Permanence Risk Analysis	22
5	Verification conclusion	23
APPENDIX A:	Corrective Action Requests, Clarification Requests and Forward Action Requests.....	1
APPENDIX B:	Verification of Monitoring Parameters	1

1 INTRODUCTION

BioCarbon Partners has commissioned DNV Climate Change Services AS (DNV) to carry out the verification of emission reductions reported for the project activity “Lower Zambezi REDD+ Project” in Zambia (the project) for the period 1 October 2009 to 1 October 2013. This report contains the findings from the verification and a verification statement for the verified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Validation/Verification Body (VVB) of the monitored reductions in GHG emissions that have occurred as a result of the project activity during a defined monitoring period.

The objective of this verification was to verify the emission reductions reported for the “Lower Zambezi REDD+ Project” for the period 1 October 2009 to 1 October 2013.

1.2 Scope and Criteria

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the project description (PD);
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be the basis for the issuance of Verified Carbon Units (VCUs).

1.3 Level of Assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement. DNV applied a materiality threshold of 5% with respect to omission or misstatements concerning reported quantities as per VCS standard.

1.4 Summary Description of the Project

Project Proponent(s):	BioCarbon Partners
Title of project activity:	“Lower Zambezi REDD+ Project” in Zambia
VCS registration No.:	Pending
Baseline and monitoring methodology	VM0009 (version 2.1)
Sectoral scope(s):	14 - Agriculture, Forestry, and Other Land Uses (AFOLU)
Location of the project activity:	Rufunsa district, Zambia
Project’s crediting period:	1 October 2009 to 1 October 2039
Period verified in this verification:	1 October 2009 to 1 October 2013

The Lower Zambezi REDD+ Project (Project) consists of 40 126 ha of privately-owned land in Rufunsa District in Zambia, which will be protected from deforestation and forest degradation activities mainly due to charcoal production and subsistence agriculture.

The core project climate accounting activities undertaken include forest carbon inventorying, modelling cumulative deforestation patterns, and soil carbon assessments. In order to support the conservation effort in the project area, a number of community project activities are undertaken to mitigate deforestation and create sustainable, scalable alternatives to deforestation, and strategic, meaningful incentives that comprise part of pay for performance programs that support forest conservation. The Project has been certified triple gold under the Climate, Community and Biodiversity Standard in 2013. Furthermore, the Project is aligned with the Government of the Republic of Zambia's (GRZ) National REDD+ Program, implemented through the Forestry Department.

2 VERIFICATION PROCESS

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with VCS criteria and guidance.

The assessment involved a desk review of relevant documentation as well as an on-site visit(s).

Verification team

Role	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit	Reporting	Supervision of	Technical review	TA 14competence
Team leader (Verifier)	Feller	Francesca	Italy	✓	✓	✓	✓		✓
Technical reviewer	Aalders	Edwin	Norway					✓	✓

2.1 Method and Criteria

The verification was performed through means of the following three steps:

- A desk review of the monitoring report /2/ and all support documents /1/ to /31/
- Follow-up interviews with project stakeholders and site inspection /32/ to /86/
- The resolution of outstanding issues and the issuance of the verification report and statement.

The following sections outline each step in more detail.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records
- The calibration and maintenance records for the monitoring instruments

- The management systems to support the project operation and monitoring

2.2 Document Review

The following tables list the documentation that was reviewed during the validation.

2.2.1 Documentation provided by the project proponent

- /1/ BioCarbon Partners: *VCS-PD for project activity "Lower Zambezi REDD+ Project" in Zambia*, Version 1 of 9 July 2013, and version 1.2 dated 19 February 2014
- /2/ Author: Monitoring report for project activity "Lower Zambezi REDD+ Project" for the period 1 October 2009 to 1 October 2013, version 1 of 2 December 2014, and version 2.1 dated 19 February 2014
- /3/ BioCarbon Partners: *NER calculations*, 29 November 2013
- /4/ BioCarbon Partners: *Carbon data monitoring period 1*, 27 November 2013
- /5/ BioCarbon Partners: *CDM independent check*, 28 November 2013
- /6/ BioCarbon Partners: *Rufunsa management plan*, Version 2.0, 27 November 2013
- /7/ BioCarbon Partners: *Biomass sampling SOP*, 28 November 2013
- /8/ BioCarbon Partners: *Biomass sampling leakage*, 8 June 2013
- /9/ BioCarbon Partners: *Biomass sampling leakage addendum*, 2013
- /10/ BioCarbon Partners: *Point interpretation methodology for a cumulative deforestation model*, 23 October 2013
- /11/ BioCarbon Partners: *Monitoring parameters*, 6 November 2013
- /12/ BioCarbon Partners: *Risk report calculation*, 12 December 2013
- /13/ BioCarbon Partners: *GIS data*, 29 December 2013
- /14/ BioCarbon Partners: *Leakage monitoring photographs*, July 2013
- /15/ BioCarbon Partners: *Sustainable harvesting plan*, September 2013
- /16/ BioCarbon Partners: *Business plan for the adoption of eco-charcoal as an alternative economic activity in Chongwe district of Zambia*, October 2012
- /17/ BioCarbon Partners: *Eco-charcoal monitoring plan*, 2013
- /18/ BioCarbon Partners: *Social monitoring plan*, 24 August 2012

1.1.1 Methodologies, tools and other guidance by the VCS or any VCS approved GHG program

- /19/ VCS: *Validation and Verification Manual*, version 3.1
- /20/ VCS: *VCS Standard*, version 3.4
- /21/ VCS: *VCS Program Guide*, version 3.5
- /22/ VCS: *Baseline and monitoring methodology VM0009*, version 2.1
- /23/ VCS: *Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities*, version 07.0.0
- /24/ VCS: *Agriculture, forestry and other land use (AFOLU) requirements*, version 3.0
- /25/ VCS: *AFOLU non-permanence risk tool*, version 3
- /26/ VCS: *Project description template*, version 3.2 of 8 October 2013

1.1.2 Documents used by DNV to cross-check information provided by the project proponent

- /27/ Environmental Services Inc: CCB validation report, 21 June 2013
- /28/ IPCC: Good practice guidance for LULUCF, Annex 3A.1, 2003
- /29/ VCS: Verified Carbon Standard website <http://www.v-c-s.org>, accessed in December 2013
- /30/ CCB: Climate Community and Biodiversity website <http://www.climate-standards.org>, accessed in December 2013
- /31/ DNV Climate Change Services: [VCS](#) validation of project "Lower Zambezi REDD+ Project", 8 March 2014

2.3 Interviews

DNV performed interviews with below listed persons to confirm information provided by the project proponent and/or to obtain information additional to that provided in the project description, monitoring report and any supporting documents.

	Date / Type of interview	Name / Organization	Topic
/32/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Wesley Roberts, BioCarbon Partners	Remote Sensing/GIS data and analyses, application of the methodology for emission reductions calculations
/33/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Leon-Jacques Theron, BioCarbon Partners	Project design and implementation, application of the methodology
/34/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Christoph Wanga, BioCarbon Partners	Biomass measurements, monitoring of biomass, soil and leakage
/35/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Elvin Muchimba, BioCarbon Partners	Biomass measurements, monitoring of biomass, soil and leakage
/36/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Andrew Tembo, BioCarbon Partners	Biomass measurements, monitoring of biomass, soil and leakage
/37/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Molly Christal, BioCarbon Partners	Project design and implementation, deforestation mitigation activities
/38/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office	Thor Kirchner, BioCarbon Partners	Project design and implementation

	☐ Telephone ☐ E-mail		
/39/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Hassan Sachedina, BioCarbon Partners	• Project design and implementation, right of use, additionality
/40/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Andrew Daka, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/41/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Hildah Mbalazi, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/42/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Biston Nichoma, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/43/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Darlington chipita, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/44/	9-12 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Maincey Hampejo, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/45/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Christopher Nyamakao, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/46/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Clinton Banda, BioCarbon Partners	• Stakeholder engagement, deforestation mitigation activities
/47/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Simon Bweupe, Provincial Forest Department	• Landuse regulation and enforcement, baseline, additionality
/48/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone	Aywell Mwaluwitika, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation

	☐ E-mail		
/49/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Shepart Chanshika, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/50/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Alex Banda, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/51/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Simon Mwachipata, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/52/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Lawford Chanshika, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/53/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Wilson Mudenda, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/54/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Alfred Tembo, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/55/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Jackson Jere, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/56/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Edma Nthaimu, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/57/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Valet Mbaluwa, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/58/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Albertina Habula, Lumwwengo village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation

/59/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Christina Chendo, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/60/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Annastazia Umpuwo, Mwaluenbe village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/61/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Gladys Musopelo, Mutonka village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/62/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Mailes Daka, Mutonka village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/63/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Grance Phiri, Katyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/64/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Rodwel Umpuwo, Mwaluwembe village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/65/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Bedson Chumbo, Katyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/66/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Jackson Musenda, Chipungu village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/67/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	David Malaya, Katyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/68/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Manuel Chitonga, Katyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
/69/	11 December 2013	Adiel Mwale, Mutonka village	• Baseline, landuse practices,

	☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail		additionality, leakage, stakeholder consultation
/70/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Happy Mwale, Mutonka village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/71/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Mwapatisha Ireen Chenda, Katyantya village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/72/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Mwaka Mubanga, Mutonka village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/73/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Potifa Zunda, Kabandi village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/74/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Willing Muchindu, Mwankomesha village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/75/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Abisalom Mwale, Mutonka village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/76/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Bupe Robinson, Kabandi village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/77/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Grey Hanagubila	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/78/	11 December 2013 ☒ On-site ☐ Face-to-face at office ☐ Telephone ☐ E-mail	Sara Mwasa, Kantyantya village	Baseline, landuse practices, additionality, leakage, stakeholder consultation
/79/	11 December 2013 ☒ On-site	Soneni Mudala, Chipungu village	Baseline, landuse practices, additionality, leakage,

	☐ Face-to-face at office		stakeholder consultation
	☐ Telephone		
	☐ E-mail		
/80/	11 December 2013	Divin Twanbo, Mutonka village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/81/	11 December 2013	Lonika Banda, Mutonka village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/82/	11 December 2013	Fenezia Banda, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/83/	11 December 2013	Siamuzyali Elisabeth, Kantyantya village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/84/	11 December 2013	Nyanga Elina, Mutonka village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/85/	11 December 2013	Grace Kinyata, Chipungo village	• Baseline, landuse practices, additionality, leakage, stakeholder consultation
	☒ On-site		
	☐ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		
/86/	12 December 2013	Deuteronomy Kasaro, National REDD+ coordinator, Zambia Ministry of Lands, Natural Resources & Environmental Protection	• Land use regulation, baseline, additionality, environmental impact assessment, local stakeholder consultation, national data availability, monitoring practices
	☐ On-site		
	☒ Face-to-face at office		
	☐ Telephone		
	☐ E-mail		

2.4 Site Inspections

From 9 December 2013 to 12 December 2013 DNV visited the project site, and on 13 December DNV interviewed Zambia's national REDD+ coordinator in Lusaka.

While on site, DNV visited 4 monitoring plots, 4 located in the project accounting area, 3 located in the overlapping portion of the reference and proxy area, and 1 located in the reference area. Plots were selected according to distance from the road and stratum so to observe all strata considered by the project (light and dense trees, grassland, fallow field and fields), but were otherwise random. In 4 of the plots it observed the above-ground- biomass measurements performed by the plot team, and compared

values to those recorded during the measurements performed for the verification of the first monitoring period, which had taken place on average one year before.

During the site visit, DNV interviewed BCP staff involved the project management, members of the plot team responsible for biomass and soil measurements, members of BCP involved in community engagement and implementation of the deforestation-mitigation activities, staff from the organization responsible for the identification of drivers of reforestation, leaders of the communities residing in the project area, a representative of the provincial forestry department, and several members of the local communities.

2.5 Resolution of Findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to DNV's conclusion that i) the project activity has been implemented and operated in accordance with the project description, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project proponent(s), or if the evidence provided to prove conformity is insufficient;
- ii. Modifications to the implementation, operation and monitoring of the project activity has not been sufficiently documented by the project proponent(s);
- iii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iv. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project proponent(s).

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification identified four CARs and no CLs. The CARs and CLs were satisfactorily addressed by the project proponent(s) by among other revising the monitoring (please refer to Appendix A for further details). In addition to the changes made to the monitoring report as a result of the verification findings, the following changes to the monitoring report (version 2.1 dated 19 February 2014) were made compared to the initial version of the monitoring report received for verification (version 1 dated 2 December 2014):

2.5.1 Forward Action Requests

The validation has raised no FARs. These FARs were adequately addressed by the project proponent(s) (please refer to Appendix A for further details).

This verification identified no FARs (please refer to Appendix A for further details).

2.6 Eligibility for Validation Activities

DNV is accredited for the validation of projects in the relevant sectoral scope(s).

3 VALIDATION FINDINGS

Not applicable: the project activity is not registered under the CDM. This verification takes place at the same time as the project validation – the project validation is discussed in a separate validation report /31/.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

As part of the site visit DNV was able to confirm that the project implementation is in accordance with the project description contained in the project description (version 1.2 of 19 February 2014).

The monitoring has been carried out in accordance with the monitoring plan contained in the project description.

The tables in Appendix B describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

The project description presented in the PD is confirmed by DNV who observed the project implementation during the site visit. The maps provided by the project proponents in the form of shapefiles and KML files /13/ were partially ground-truthed by DNV while driving through the project area, reference are and proxy are for the purpose of visiting monitoring plots.

The implementation status presented in the Monitoring Report was verified through interviews held with relevant staff /37//40/ to /46/, and cross-checked with representatives of the local communities during the site visit /48/ to /85/.

The monitoring system was verified by following the procedure outlined in section 2.4 of this report (above), which involved the observation of biomass measurements by the plot team /34/ to /36/.

For the plots located in the reference and proxy area, DNV observed the location of the plot to confirm it was “in status” as required by the methodology /22/, and the measurements taken to ensure that biomass monitoring only took place in the proxy area. The measurements observed confirm the correct application of the methodology, with the plot falling under the reference area only being used for soil measurements, while the plots falling under both the reference area and the proxy area being used for both biomass and soil measurements.

Regarding the measurement of above-ground biomass, DNV observed no systematic errors, detailed measurement procedures /7//8//9/, and good knowledge of the procedures by the plot team /34/ to /36/. A number of discrepancies were noticed between the earlier measurements and the measurements carried out on site, especially in the measurement of the plot slope. Inconsistencies in the recording of the slope were observed mostly when the monitoring plot presented more than one slope, however inconsistency were observed to have equal probability to result in an underestimation or overestimation of the corrected slope area, and no systematic bias was observed. The project participant has now developed a procedure for the consistent measurement of the plots’ slope.

The project is implemented in Zambia, which has no emission trading program or binding limits on GHG emissions.

The project is registered under the CCB Standard: VO12079.00. This information is clearly provided in section 1.12 of the PD, and was verified by DNV against the CCBA website /31/. The PD states the intention of the PP not to claim credits under any other GHG programme. This was also confirmed on site with interviews with the project participant /32/ to /39/. The PD contains a confirmation by the PP that the project has not been rejected by any other GHG program. This was also confirmed on site with interviews with the project participant. /32/ to /39/.

The project proponent applies a deviation to the monitoring of leakage: instead of having the Forest Inventory Team members estimating degradation visually as described by the methodology in section B.2.8.2, they will be required to georeference every felled tree in a 1 ha area. This value is then placed in a degradation category as per VM0009 /22/. The level of degradation is then compared against the average (i.e. lower boundary of the confidence level) density of trees/ha in the project accounting area. The proposed method can be considered more accurate than visually estimating degradation as indicated by the methodology, and is therefore considered acceptable.

The information presented in the MR was cross-checked against the requirements set in the VCS Monitoring Report Template, and found complete.

In addition to the requirements indicated in the VCS MR template, the methodology sets further requirements in terms of information to be included in the MR, called Monitoring Report Requirements (MR). These additional requirements were assessed by the project proponent for applicability, and an overview of their applicability to the project is presented at the beginning of the MR. DNV checked the list presented against the methodology, and the MR contents against the overview table.

The information presented in the MR was verified by DNV during the site visit.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Quantification of baseline emissions:

Baseline emissions are quantified through baseline emission models, i.e. the Biomass Emissions Model (BEM) and the Soil Emission Model (SEM). Both models rely on an underlying model for deforestation in the reference area, which is determined by parameters α , β , γ and θ . Since the project achieved a good model fit without the need to consider covariates, parameters γ and θ have been excluded.

Deforestation model:

The deforestation model /3//4/ was run and discussed during the site visit.

Inputs to the model: The project proponent used available Landsat imagery spanning from 1984 to 2009 /13/. Although deforestation has been observed in the area since the 1970s, 1984 was selected as starting date of the historic reference period because it coincides with the first suitable available image in the Landsat archive. This choice is acceptable based on the indications of paragraph 6.7.2.2. of the methodology /22/, which for baseline scenario U3 allows the historic reference period to be determined based on available satellite imagery if no important events are identified. Despite the entry into force of

regulation between the 1970s and 1984, DNV confirmed through interviews /47//86/ that poor enforcement of regulation has been common, and hence it is reasonable to conclude that no important events have taken place that would impact the selection of the historic reference period.

6 largely cloud free images were selected for this purpose, and are listed in table 12 of the PD /1/. These comply with the requirements of the methodology in that they allowed 100% double coverage of the area was achieved with a total of 2 600 points (the 1984 image contained some cloud, but points covered by the clouds were removed by the population data set). Moreover, the selected images have a spatial resolution of 30 m, and are located evenly across the reference period (as presented in figure 15 of the PDD). The 2600 points showing 100% double coverage and distributed systematically on a grid largely exceed the minimum sample size of 300 required by the methodology, and were thus selected as the ultimate sample size used to estimate β . These were classified as either forest or non-forest throughout the reference period. The points all had equal weighting because no corrections for cloud cover were needed. Conversion from forest (0) to non-forest (1) starts becoming apparent in 1989, while in 1984 all points were “forest”. The 2 600 points observed and classified over six historical images resulted in the logistic function being calculated using 15 600 state observations during the historic reference period.

Calculation: The model applies a generalized linear regression model. The best fit was obtained by the project proponent by not considering weights. Only this option resulted in the regression being “highly significant” (99%). The good fit of the model is also apparent from the graphical representation of the model presented in figure 17 of the PD /1/. Computing α and β based on the sample deforestation data returned respectively a value of 0.5791768 and 0.0003653.

For quality purposes, the project proponent has developed detailed procedures for forest state point interpretation /10/. Moreover, the assessment of forest state observation was subject to an independent check performed by a third party /16/.

Baseline scenarios for selected carbon pools:

The methodology defines the different baseline scenarios applicable to each carbon pool based on the overall baseline scenario identified /22/.

For the project activity, the following applies:

- Above-ground other (non-merchantable tree) with U3 as baseline scenario: the above-ground portions of trees that are not commercially viable are assumed to be converted to an emission first in the stratum with the lowest carbon stocks and last in the stratum with the highest carbon stocks;
- Below-ground other (non-merchantable tree); with U3 as baseline scenario: below-ground biomass is conservatively assumed to be partially removed or to begin decay at the time of deforestation, first in the stratum with the lowest carbon stock and last in the stratum with the lowest carbon stocks;
- Soil organic carbon with U3 as baseline scenario: it is assumed that soil carbon will deplete to the SOC measured in the proxy area after a long period of time.

Given these premises, the baseline model comprises the biomass emissions model, the soil emissions model, and the model for spatial component that is unique to baseline scenario U3.

Biomass Emissions Model: for U3, this is given by equation F.4 of the methodology /22/. The PD indicates this was calculated to be 1 564 437 tCO₂e /1/. Since the validation takes place at the time of the first verification of the project, equation F.15 is also applied in the ER calculation spreadsheet for the first monitoring period /3//4/. The baseline scenario average carbon stock in selected carbon pools has been

calculated for AGOT and BGOT using equations F.18 and F.23 of the methodology. Cumulative emissions from BGB are calculated using equation F.29 of the methodology, while the carbon not decayed in BGB is calculated by applying equations F.30 and F.31.

In addition to the biomass model above, the methodology indicates that baseline scenario U3 requires the application of the decay emissions model described by equation F.24 to estimate the carbon not decayed in BGB (equation F.9), as well as in SOC (equation F.10).

Soil Emissions Model: for U3, this is given by equation F.7 of the methodology. The PD indicates this was calculated to be 856 870 tCO₂e. The cumulative baseline emissions from SOC for U3 are calculated with equation F.26 and F.28 of the methodology, while the cumulative carbon not decayed in SOC is given by equation F.32. The use of equation F.26, which the methodology indicates as current baseline emissions from SOC for type P baseline scenarios, is considered acceptable since this equation is in line with equations F.15 and F.30 which are not indicated as only applicable to a scenario of type P.

The application of the cumulative emission model through equations F.4 (baseline emission model), F.7 (soil emission model), F.9 (decay emission model for SOC), and F.10 (decay emission model for BGB) was achieved using the Visual Basic programming language. The application of equations F.4, F.7, and F.9 was checked and found correct. For the application of the remaining equations (i.e. F.18, F.23, F.24, F.28, F.29, F.31, and F.32), DNV checked the source data collected during the monitoring period, and the calculations that resulted in the final carbon figures.

The methodology requires the baseline emissions model to be based on data collected in the reference area, which used to estimate deforestation parameters, and in the proxy area, where residual biomass is measured. The methodology sets a number of requirements for the identification of each of the areas, but the selection is otherwise left to the discretion of the PP. The selection of the project accounting area and of the reference area was validated as part of the assessment of the applicability of the methodology. The proxy area has been validated as follows:

Proxy area:

- Is located in the same general region as the project area: this is confirmed by the maps provided by the PP /13/ and was observed on site;
- On average, the proxy area shall not be forested as of the project start date: this is confirmed by the maps provided by the PP /13/ and was observed on site;
- It shall have a similar landscape configuration to the project accounting area: This is demonstrated by the maps provided by the PP (and shown in the PD) and was observed on site;
- The proxy area shall not be altered after the first monitoring period:

In addition to the spatial boundaries of the three areas required to calculate baseline emissions, the methodology requires the identification of a reference period, which serves as temporal boundary to the calculations. The reference period has already been validated as part of the input parameters to the baseline emission model.

The methodology has a number of requirements for minimizing uncertainty, which are outlined in section 6.7.9. The PP has made every attempt to mitigate uncertainty, which resulted in a forest state interpretation document /10/, an independent check of point interpretation by associates from the Cape

Peninsula University of Technology /16/, and the identification and correction of systematic errors using the Cumulative Deforestation Model developed for ArcGIS by Wildlife Works /32//33/.

Moreover, the methodology requires the project proponent to determine deductions for uncertainty, which are described by equation F.52 of the methodology, and equation F.14 to calculate the approximate estimate of uncertainty for the logistic function of deforestation.

Quantification of project emissions:

According to the methodology /22/, project emissions are calculated from the events of biomass consumption through forest fires, burning, logging or other disturbances. The calculation of project emissions is outlined in equation F.40 of the methodology, but since logging does not take place in the baseline, and the carbon stored in wood products has therefore been excluded, the project emissions consist of GHG emissions from burning, and have been calculated using equation F.41.

Emissions from burning have been calculated to be 0 because, during the first 5 years of the project activity, no tree biomass has been lost because of fires. It was in fact observed on site that the miombo vegetation which cover the project area has evolved a strong resistance to fire: fire events in this area are frequent, but they rarely reach the intensity required to kill the trees. DNV observed several burned areas within the project area, and observed no dead trees. Moreover, DNV checked measurements performed in monitoring plots which showed evidence signs of burning, and observed that the trees recorded still coincided with the records collected as part of the previous monitoring exercise, which had taken place on average one year before the site visit. The project proponent has subscribed to a number of satellite alert services targeting forest fires, and maintains staff patrolling the area for security purposes that are able to report fire occurrences. DNV considers the choice of estimating project emissions due to fire as 0 justified.

The calculation of project emissions has been based on the data recorded in the first five years of the project lifetime, and is not based on assumptions.

Quantification of leakage:

The methodology contemplates two types of leakage /22/: activity-shifting leakage and market-effect leakage. As the project does not cause a reduction in the supply of commodities since no merchantable tree is present in the area /47/, market-effect leakage has been excluded from the calculations. Leakage emission are therefore estimated using the leakage emission model described by the methodology in equation F.45, and calculated cumulative emissions from activity-shifting leakage with equation F.44. The resulting activity-shifting leakage emissions were insignificant, and have therefore considered 0.

The insignificance of leakage emissions was verified with georeferenced, dated pictures provided by the project participant for each monitoring plot in the leakage area, and cross-checked through interviews with the plot team responsible for the measurements, which confirmed that no deforestation activities had been observed in the leakage area.

In addition to the quantification of leakage emissions, the methodology requires project proponents to implement leakage mitigation strategies. The project proponent has initiated several activities that involve the communities residing in the reference area. These described in the PD, and were verified through interviews with the local communities. DNV confirmed the information presented in the PD in relation to deforestation mitigation activities implemented by the project proponent.

The methodology has been designed in such way as to require the identification of an activity-shifting leakage area and a market-effect leakage area. The methodology sets a number of requirements for the identification of each of the areas, but the selection is otherwise left to the discretion of the PP. The project proponent only identified an activity-shifting leakage since no market-effect leakage is foreseen. The selection of this area is assessed here:

Activity-shifting leakage area:

- the activity-shifting leakage area is in the same general region as the project area: in fact, the area identified to monitor leakage is adjacent to the project area;
- As of the project start date, the activity-shifting leakage area is entirely forested and no larger than the project accounting area: the activity-shifting accounting area (which excludes steep slopes) extends to 27 806 ha, compared to the 33 338 ha of the project accounting area. Moreover, at the time of the starting date of the project was entirely forested;
- the leakage area is located in the same proximity to the agents of deforestation, as it shares with the project area approximately the same distance from the reference area where the agents of deforestation originate;
- agents of deforestation have access to the area: in fact there are a number of roads going through this area which the project proponents use to access the monitoring plots located in the area;
- the area shares the same political boundaries with the project area;
- It has similar landscape configuration to the project accounting area.

The project participant calculated activity-shifting leakage based on the data recorded in the first 5 years of the crediting period, which presented no uncertainties.

Summary of net GHG emission reductions or removals:

A conclusion on the overall quantification of GHG emission reductions will be reached once relevant CARs and CLs raised as part of the project's validation and listed in DNV's validation report are closed.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

DNV discussed the data collection and transfer systems with the project participant during the site visit /32//33/, and observed the data collection which takes place as part of the biomass measurements in the monitoring plots /7//8//34/ to /36/. Data are collected through in the field through an Open Data Kit ODK system. These are then automatically transferred and kept in an online database (currently an excel file), which is used to perform the calculations. A copy of the database has been submitted to DNV /4/.

Procedures for handling monitoring equipment are outlined in the Standard Operating Procedures (SOP) for biomass measurement /7/. Although the calibration of the main piece of equipment (diameter tape and clinometer) are not provided as the equipment is calibrated at the time of manufacturing, DNV received confirmation that there is always an equipment check before leaving to the field, and back-ups are always brought along in case of equipment damage.

It can be concluded that the quality of evidence to determine GHG emission reductions is acceptable.

4.4 Non-Permanence Risk Analysis

The non-permanence risk analysis has been performed as part of the project validation. All relevant information can be found in DNV's validation report.

5 VERIFICATION CONCLUSION

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the project activity “Lower Zambezi REDD+ Project” in Zambia for the period 1 October 2009 to 1 October 2013.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

DNV conducted the verification on the basis of the baseline and monitoring methodology *VM0009* (version 2.1), the monitoring plan contained in the project description (version 1.2 of 19 February 2014) and the monitoring report (version 2.1) dated 19 February 2014. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV’s verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 1 October 2009 to 1 October 2013 are fairly stated in the monitoring report (version 2.1) dated 19 February 2014.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology *VM0009* (version 2.1) and the monitoring plan contained in the project description (version 1.2 of 19 February 2014).

DNV Climate Change Services AS was able to verify that the emission reductions from the project activity “Lower Zambezi REDD+ Project” in Zambia during the period 1 October 2009 to 1 October 2013 amount to 488 081 tonnes of CO₂ equivalent.

Verification period: From 1 October 2009 to 1 October 2013

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

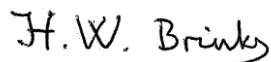
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer Amount	Net GHG emission reductions or removals (tCO ₂ e)
2009	35,763	0	0	5,007	30,756
2010	141,884	0	0	19,864	122,020
2011	141,884	0	0	19,864	122,020
2012	142,273	0	0	19,918	122,355
2013	105,733	0	0	14,803	90 930
Total	567,537	0	0	79,455	488,081

DNV does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification was based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.



Francesca Feller
Verifier
DNV Oslo, Norway



Hendrik W. Brinks
Approver,
DNV Climate Change Services AS

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APPENDIX A: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS
Table 1 Resolution of Corrective Action Requests and Clarification Requests

Corrective action and/ or clarification requests	Response by project proponent(s)	Verification conclusion
CAR1: The project proponent is requested to produce a procedure for the consistent measurement of slope in monitoring plots, to avoid inconsistencies between different monitoring episodes.	The carbon monitoring protocol Annex (L/D) has been updated in section 6.2 to include a consistent measurement of slopes.	The biomass sampling SOP have been revised and now allow the consistent measurement of the slope in monitoring plots. CAR1 is closed.
CAR2: The deviations from the methodology described in the Monitoring Report are not consistent with the deviation described in the PD (there are two deviations described in the MR and one in the PD).	The MR has been updated to be consistent with the PD.	Methodology deviations are consistent between the PD and the MR. The deviation applied is discussed in the validation report. CAR2 is closed.
CAR3: The MR submitted by the project proponent does not comply with the requirements set by the VCS MR template in that the following information is missing from the MR: - Report ID and date of issue (page 2); - Information in section 1.1 of the MR template, in particular the relevant implementation dates and the total GHG emission reductions generated; - Section 1.9 of the CVS MR template is missing from the Monitoring Report;	The MR has been updated to include the missing sections. Annex P/G and Annex Q/H have been updated to conform to the VCS template. All information has been transferred to the appropriate VCS tables.	The information provided in the MR has been revised to comply with the requirements of the VCS MR template. CAR3 is closed.

Corrective action and/ or clarification requests	Response by project proponent(s)	Verification conclusion
- Section 2.2.1 of the CVS MR template is missing from the Monitoring Report. The information belonging to section 2.2.1 has been instead provided in section 2.2.2. The deviation described refer to a methodology deviation, not to a project description deviation; - The information required by the CVS MR template to be included in section 3.1 and 3.2 is missing from the MR; - The information provided in section 4 of the MR does not comply with the VCS MR template in that it is not sufficient to allow the reader to reproduce the calculation performed. Also, the table in section 4.4. of the VCS MR template has not been used;		
CAR4: - The table of Monitoring Report Requirements in the MR presents some inconsistencies, in that for certain parameters that the methodology indicates as generally applicable to baseline scenario U3, but that are not actually applicable to the project activity (e.g. parameters relative to merchantable trees, wood, market-effect leakage, or reversals), the applicability table in the MR indicates they are not applicable. For	Inconsistencies have been corrected in the MR.	The list of MR requirements has been revised to comply with the methodology. CAR4 is closed.

Corrective action and/ or clarification requests	Response by project proponent(s)	Verification conclusion
other parameter that are equally not applicable to the project activity or to the current monitoring period (e.g. parameters relative to covariates, previous monitoring periods, or log export monitoring records), the same table indicates they are applicable. The project proponent is requested to apply the indications of Appendix J of the methodology in a consistent way; - Some of the MR Requirements indicated as applicable in the applicability table at the beginning of the MR are not found in the main text of the MR;		

Table 2 Forward action requests from previous verification

Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
Not applicable, this is the first verification.		

Table 3 Forward action requests from this verification

Forward action request	Response by project proponent(s)
Not applicable, this is the first verification.	

APPENDIX B: VERIFICATION OF MONITORING PARAMETERS

Data / Parameter:	$A_{p1}^{[m=0]}$ Area of project accounting area stratum 1 prior to first verification event
Measuring frequency/ reporting frequency	First monitoring period / 10 years
How is this parameter monitored?	Through GIS analysis prior to sampling
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place. The details of monitored parameters are provided in Annex Q.

Data / Parameter:	$A_{p2}^{[m=0]}$ - Area of project accounting area stratum 2 prior to first verification event
Measuring frequency/ reporting frequency	First monitoring period / 10 years
How is this parameter monitored?	Through GIS analysis prior to sampling
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place. The details of monitored parameters are provided in Annex Q.

Data / Parameter:	$c_B^{[m]}$ Baseline carbon stocks at the end of the current monitoring period
Measuring frequency/ reporting frequency	20% of plots measured annually.
How is this parameter monitored?	Measurement of biomass and SOC in sampling plots in the proxy area sampling.
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$C_{B\ BGB}^{[m]}$ Carbon not decayed in BGB at the end of the current monitoring period
Measuring frequency/ reporting frequency	The parameter is not measured, but based on a default value indicated by the methodology.
How is this parameter monitored?	The parameter is not measured, but based on a default value indicated by the methodology.
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management is not required in this case.

Data / Parameter:	$C_{B\ SOC}^{[m]}$ Carbon not decayed in SOC at the end of the current monitoring period
Measuring frequency/ reporting frequency	Fixed once off sampling, not repeated as per VM0009
How is this parameter monitored?	Proxy area sampling as per the protocol in Annex L and application of equation F.7, VM0009 V2.1
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$C_{B\ b}^{[m]}$ Baseline scenario average carbon stock in selected carbon pools
Measuring frequency/ reporting frequency	20% of all permanent monitoring plots re-monitored annually.
How is this parameter monitored?	Proxy area sampling
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$C_{B\ BM}^{[m]}$ Baseline carbon stocks in biomass at the end of the current monitoring period
Measuring frequency/ reporting frequency	20% of all permanent monitoring plots re-monitored annually.
How is this parameter monitored?	Proxy area sampling

Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.
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Data / Parameter:	$c_{B\ SOG}^{[m]}$ Baseline soil carbon stocks at the end of the current monitoring period
Measuring frequency/ reporting frequency	Once off measurement as per VM0009 V2.1
How is this parameter monitored?	Proxy area sampling as per the protocol in Annex L
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$c_P^{[m]}$ Project carbon stocks at the end of the current monitoring period
Measuring frequency/ reporting frequency	20% of plots monitored annually.
How is this parameter monitored?	Proxy area sampling as per the protocol in Annex L
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$c_P^{[m-1]}$ Project carbon stocks at the beginning of the current monitoring period
Measuring frequency/ reporting frequency	20% of plots monitored annually.
How is this parameter monitored?	Proxy area sampling as per the protocol in Annex L
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$c_P^{[m=0]}$ Project carbon stocks prior to first verification event
Measuring frequency/ reporting frequency	20% of plots monitored annually.
How is this parameter monitored?	Through sampling in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$c_{P\ 2\ BM}^{[m=0]}$ Project carbon stocks in biomass in stratum 1 prior to first verification event
Measuring frequency/ reporting frequency	20% of all plots sampled annually
How is this parameter monitored?	Through sampling in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$c_{P\ BM}^{[m=0]}$ Project carbon stocks in biomass in stratum 2 prior to first verification event
Measuring frequency/ reporting frequency	20% of all plots sampled annually
How is this parameter monitored?	Through sampling in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$c_{P\ b}^{[m]}$ Average carbon in biomass in the project accounting area
Measuring frequency/ reporting frequency	20% of all plots sampled annually

How is this parameter monitored?	Through sampling in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$c_{P\,SOC}^{[m=0]}$ Project soil carbon stocks prior to first verification event
Measuring frequency/ reporting frequency	Once of monitoring as per VM0009 V2.1
How is this parameter monitored?	Through sampling in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{\Delta\,GER}^{[m]}$ GERS for the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Area measurements
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{\Delta\,GER}^{[t]}$ GERS for monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Area measurements
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in

reporting of emission reductions	place.
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Data / Parameter:	$E_{\Delta NER}^{[t]}$ NERs for monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Area measurements
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_B^{[m]}$ Cumulative baseline emissions at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period - annually
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_B^{[m-1]}$ Cumulative baseline emissions at the beginning of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period - annually
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\Delta}^{[m]}$ Change in baseline emissions
Measuring frequency/ reporting frequency	Every monitoring period - annually
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\Delta BGB}^{[i]}$ Change in baseline emissions from below-ground biomass during monitoring period i
Measuring frequency/ reporting frequency	Every monitoring period - annually
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\Delta SOC}^{[m]}$ Baseline change in emissions from soil carbon
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\Delta SOC}^{[i]}$ Baseline emissions from soil carbon in monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the proxy area

Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.
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Data / Parameter:	$E_{B\ BGB}^{[m]}$ Cumulative baseline emissions from below-ground biomass at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\ BGB}^{[m-1]}$ Cumulative baseline emissions from below-ground biomass at the beginning of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\ BM}^{[m]}$ Cumulative baseline emissions from biomass at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in

correct transfer of data and reporting of emission reductions	place.
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Data / Parameter:	$E_{B\ SO C}^{[m]}$ Cumulative baseline emissions from soil carbon at the end of the current monitoring period
Measuring frequency/ reporting frequency	Soil carbon is only quantified once at the first verification event as per VM0009.
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B\ SO C}^{[m-1]}$ Cumulative baseline emissions from soil carbon at the beginning of the current monitoring period
Measuring frequency/ reporting frequency	Soil carbon is only quantified once at the first verification event as per VM0009.
How is this parameter monitored?	Through measurements in the proxy area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{B A}^{[m]}$ Cumulative emissions allocated to the buffer account at the end of the current monitoring period
Measuring frequency/ reporting frequency	Non-permanence risk revised at every baseline re-assessment.
How is this parameter monitored?	Monitored based on the VCS Non-Permanence Risk Report
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Monitored based on the VCS Non-Permanence Risk Report

Data / Parameter:	$E_L^{[m]}$ Cumulative emissions from leakage at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the leakage area(s)
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_L^{[m-1]}$ Cumulative emissions from leakage at the beginning of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through measurements in the leakage area(s)
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{L\Delta}^{[m]}$ Change in emissions due to leakage
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Plot based sampling of leakage area and estimation of degradation.
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{L\Delta S}^{[m]}$ Cumulative emissions from activity-shifting leakage at the end of the current monitoring period
Measuring frequency/ reporting frequency	Measurements in the activity-shifting leakage area
How is this parameter monitored?	Every monitoring period

Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.
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Data / Parameter:	$E_{LME}^{[m]}$ Cumulative emissions from market effects leakage at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Measurements in the market-effects leakage area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place.

Data / Parameter:	$E_{P\Delta}^{[m]}$ Change in project emissions
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Monitoring records for Forest Fire, Burning, logging, wood products, and natural disturbance events
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place

Data / Parameter:	$E_{P\Delta BRN}^{[m]}$ Cumulative project emissions due to burning at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Through monitoring plots in the project accounting area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place

Data / Parameter:	$E_U^{[m]}$ Cumulative confidence deduction at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Biomass and soil carbon inventory data, Annex I
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place

Data / Parameter:	$p_{L\ DEG}^{[m]}$ Portion of leakage due to degradation at the end of the current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Throuh monitoring in the leakage area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place

Data / Parameter:	$p_{L\ DEG}^{[m=0]}$ Portion of leakage due to degradation prior to first verification event
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Throuh monitoring in the leakage area
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. DNV was provided with the measurements SOPs, observed measurement being taken on site, and interviewed members of the inventory team responsible for the measurements. Adequate QA/QC procedures are in place

Data / Parameter:	$t^{[i-1]}$ Time from project start date to beginning of monitoring period i
Measuring frequency/ reporting frequency	Not applicable

How is this parameter monitored?	Through monitoring records
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Not applicable

Data / Parameter:	$t^{[m]}$ Time from project start date to end of current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Monitoring records
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$t^{[m-1]}$ Time from project start date to beginning of current monitoring period
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Monitoring records
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$U_B^{[m]}$ Total uncertainty in proxy area carbon stock estimate
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting area carbon stocks
Does the data management (from monitoring equipment to reduction calculation) ensure	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

correct transfer of data and reporting of emission reductions	
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Data / Parameter:	$U_{EM}^{[M]}$ Total uncertainty in Baseline Emissions Models
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting area carbon stocks
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.

Data / Parameter:	$U_P^{[m]}$ Total uncertainty in project accounting area carbon stock estimate
Measuring frequency/ reporting frequency	Every monitoring period
How is this parameter monitored?	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting area carbon stocks
Does the data management (from monitoring equipment to reduction calculation) ensure correct transfer of data and reporting of emission reductions	Data management ensures correct transfer of data and reporting of emission reductions. QA/QC measures are in place.