



# Validation Report

**Version 1.0**

**03 October 2023**

Aster Global Environmental Solutions, Inc.



<b>Forest Carbon Partnership Facility (FCPF)</b> <b>Carbon Fund</b>  <b>Validation Report (VAR)</b>	
<b>ER Program Name and Country:</b>	<i>Emission Reduction Program in North Central Coast, Vietnam</i>
<b>Crediting Period</b>	<i>01-01-2018 to 31-12-2025</i>
<b>Name of the VVB:</b>	<i>Aster Global Environmental Solutions, Inc.</i>
<b>Contact information of the VVB:</b>	<b>Name:</b> <i>Aster Global Environmental Solutions</i> <b>Contact:</b> <i>Janice McMahon</i> <b>Phone:</b> <i>+1 330.294.1242 ext. 102</i> <b>Email:</b> <i>jcmahon@asterglobal.com</i> <b>Address:</b> <i>3800 Clermont St. NW North Lawrence, OH 44666</i>
<b>Date of the Validation Report:</b>	<i>03 October 2023</i>
<b>Version:</b>	<i>Final v1.0</i>
<b>Report Approved by</b>	<i>Shawn McMahon</i>

# 1. VALIDATION STATEMENT

The review and cross-check of explanations and justifications included in the Monitoring Report dated 05-09-2023 (Vietnam MMR1\_Final 06.09.2023\_VN updated 01.10.2023\_Clean.pdf) and supporting documents have provided Aster Global Environmental Solutions, Inc.'s (herein referred to as Aster Global) with sufficient evidence to determine with a *reasonable* level of assurance the compliance of the Emission Reduction Program in North Central Coast, Vietnam (herein referred to as NCC ER Program) with the applicable validation criteria set out in the FCPF requirements.

The scope covered by the validation includes the ER Program’s crediting period (01-01-2018 to 31-12-2019), the reference period (2005-2015), the accounting area (5,144,520<sup>1</sup> hectares), the REDD Country Participant’s Forest Monitoring System, the national REDD+ Programs and Projects Data Management System, and the following GHG sources, sinks, REDD+ activities and carbon pools:

<b>Sources/Sinks/Reservoirs</b>	<p><b>REDD+ Activities (sources and sinks)</b>                  Emissions from deforestation – included                  Emissions from forest degradation – included                  Removals from forest enhancement – included                  Removals from reforestation – included                  Emissions and/or removals from conservation of carbon stock – excluded                  Emissions and/or removals from sustainable management of forests – excluded</p> <p><b>Carbon Pools</b>                  Aboveground biomass in trees – included                  Belowground biomass in trees – included                  Dead wood – excluded                  Litter – excluded                  Soil organic carbon – excluded                  Harvested wood products – excluded</p> <p><b>GHGs</b>                  CO<sub>2</sub> – included                  CH<sub>4</sub> – excluded                  N<sub>2</sub>O – excluded</p>
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During the validation process, the audit team issued findings as specified in the FCPF Validation and Verification Guidelines v2.4 Section 11. The VVB issued Major Corrective Actions (MCARs), Minor Corrective Actions (mCARs), and Observations (OBS).

A total of 25 MCARs, 1 mCAR and 0 Observations were raised as part of the validation process. A total of 25 MCARs were successfully addressed by the ER Program and closed by the VVB. The NCC ER Program opted not to respond to the mCAR. Per the FCPF Validation and Verification Guidelines, the ER Program has until the time of the next verification to close out the 1 mCAR issued. These findings are described in Appendix 1 of this report.

Regarding the Reference Level, it is Aster Global’s opinion that NCC ER Program meets the applicable validation criteria set out in the FCPF Validation and Verification Guidelines and that it is free of material misstatements. Hence, Aster Global recommends the FCPF Carbon Fund to continue with the relevant subsequent steps to proceed with the verification of the FCPF Emission Reductions units.

Statement Issuing Date: 03 October 2023

Intended User: World Bank Group, FCPF Carbon Fund Participants

<sup>1</sup> Please note that due to discrepancies in the generated forest cover maps by the ER Program the forest cover maps have been adjusted to match the total reported area of the ER Program.

TEAM LEADER: Shawn McMahon

LEGAL REPRESENTATIVE: Janice McMahon

## 2. Agreement

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### 2.1 Level of Assurance

The level of assurance determined the depth of detail that the validation team used to determine if there were any errors, omissions, or misrepresentations. Aster Global assessed the NCC ER Program's implementation of general principles, data collection and processing, sampling/monitoring descriptions, documentation, calculations, etc., to provide *reasonable* assurance to meet the requirements of the FCPF Carbon Fund and to satisfy the professional judgement of the audit team.

Based on the previous provisions and considering the findings raised during the audit, a positive evaluation statement reasonably ensures that the FCPF (Forest Carbon Partnership Facility) Program Reference Level is materially correct and is a fair representation of the GHG data and information provided in the ER Monitoring Report and supporting documents.

### 2.2 Objectives

As outlined in the Validation and Verification Guidelines (VVG) - (Section 8.2)<sup>2</sup>, the general objectives of the validation/verification of NCC ER Program included the following:

- “Review of the ER Monitoring Report and supporting information to confirm the correctness of presented information;
- Identify if the methodological steps and data are publicly available in accordance with applicable criteria;
- Assess whether the start date of the crediting period proposed by the ER Program is in compliance with the definition provided in the FCPF Glossary of terms;
- Assess the extent to which reported ERs /Reference Level have been reported with a transparent and coherent step-by-step process that enables reconstruction and have meet the requirements of applicable criteria;
- Assess the extent to which the reported GHG emissions / Emission Reductions / Reference Level (or the revised Reference Level if technical corrections are applied) is materially accurate, i.e. free of material misstatements, errors or omissions;
- Identify source(s) of Uncertainty due to both random and systematic errors related with the Reference Level setting and any sources of bias that can impact the estimate of the Total ERs, and determine whether the ER Program has conducted the Uncertainty analysis in compliance applicable criteria;
- Assess the Forest Monitoring System of the ER Program and validate that there are controls for sources of potential errors, omissions, and misstatements in place;
- Identify components of the Forest Monitoring System that require attention and/or adjustment in future monitoring and reporting or identify areas of risk of future noncompliance;”

The validation process ensured all required objectives have been met during the course of the audit.

### 2.3 Criteria

The criteria included the following normative documents provided by the FCPF:

- FCPF Methodological Framework, Version 3, April 2020
- Buffer Guidelines, Version 2, April 2020

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<sup>2</sup> Forest Carbon Partnership Facility, Validation and Verification Guidelines, Version 2.4, August 2021 (Section 8.2)

- Guideline on the application of the Methodological Framework Number 1, Version 1, June 2016
- Guidelines on the application of the methodological Framework Number 2, Version 2, November 2020
- Guideline on the application of the Methodological Framework Number 3, Version 1, 2018
- Guidelines on the application of the Methodological Framework Number 4, Version 1, 2020
- Process Guidelines, Version 5.2, August 2021
- FCPF Validation and Verification Guidelines, Version 2.4, August 2021
- FCPF – Glossary of Terms Version 2.1, August 2021
- ISO 14064-3:2006
- ISO 14065:2013
- ISO 14066:2011
- IAF MD 6:2014
- Forms and templates as published and available by FCPF
- Training Presentations presented by FCPF
- Formal clarification provided by The Secretariat via email

Criteria Indicators	Topic	Validation	Verification
6	Data availability	X	X
7, 8, 9.1	Identification and address sources of uncertainty	X	X
9.2, 9.3	Estimation of residual uncertainty		X
14.1	Consistency of monitoring estimates with Reference Level		X
17.3, 17.4	Monitoring and reporting of displacement mitigation		X
18.2	Addressing reversals		X
19	Account for reversals		X
22	Calculation of Emission Reductions		X
23	Double counting		X
37	REDD project and program DMS		X

## 2.4 Scope

The general scope of the validation<sup>3</sup> included:

- Crediting period of the ER Program;
- The selected Reference Period (validation)
- The ER Program Accounting Area, as defined in the ER Program's Final ER Program Document (ER-PD);
- The GHG sources and sinks associated with the REDD+ activities accounted for as required by the Methodological Framework;
- The carbon pools and greenhouse gases to be accounted for as required by the Methodological Framework;
- The REDD Country Participant's Forest Monitoring System as described in the ER Monitoring Report;
- The national REDD+ Program and Project's Data Management System.

<sup>3</sup> Pursuant to the Validation and Verification Guidelines Paragraph 33 is not part of the validation scope. In the Methodological Framework the Criterion not included in the validation scope are Criterion 3-5, 10-13, 14.2, 14.3, 15, and 16.

## 2.5 Materiality

Materiality is a concept that the individual or aggregation of misstatements/misrepresentations, errors and omissions could affect the GHG assertion and the decisions of the intended users. Materiality was also used as part of the Validation and Verification Sampling Plan design to determine the type of audit processes used by Aster Global to minimize the risk of not detecting a material misstatement. As specified in the Validation and Verification Guidelines (VVG) - (Section 8.5), the threshold for quantitative materiality is 1%.

The validation process based on the desk review found that there are no quantitative or qualitative material discrepancies affecting the reference level.

### 3. METHODOLOGY AND PLANNING

#### 3.1 Validation Team

Name	Role	Activities				
		Desk review	Site visit	Reporting	Supervision	Technical review
Janice McMahon	<ul style="list-style-type: none"> <li>Project Manager / Planning / Team Coordination / Quality Assurance Quality Control (QAQC)</li> </ul>			X	X	X
Shawn McMahon	<ul style="list-style-type: none"> <li>Team Leader, Technical Expert, Lead Validator / Verifier, AFOLU Specialist / Desktop Review / Virtual Site Visit / Client Communications</li> </ul>	X	X	X	X	
Mansfield Fisher	<ul style="list-style-type: none"> <li>Lead Validator/Verifier, AFOLU Specialist / Desktop Review / Virtual Site Visit / Client communications</li> </ul>	X	X	X	X	
Matthew Perkowski	<ul style="list-style-type: none"> <li>Technical Expert, Forest Biometrician / Team Member / Virtual Site Visit</li> </ul>	X	X	X		
Taek Joo Kim	<ul style="list-style-type: none"> <li>Technical Expert, Forest Biometrician / Team Member / Virtual Site Visit</li> </ul>	X	X	X		
Sandesh Shrestha	<ul style="list-style-type: none"> <li>Remote Sensing and GIS Specialist / Team Member / Virtual Site Visit</li> </ul>	X	X	X		
Justin Ziegler	<ul style="list-style-type: none"> <li>Forest Biometrician / Team Member / Virtual Site Visit</li> </ul>	X				
Matthew Campbell	<ul style="list-style-type: none"> <li>Field Forester / Team Member / Virtual Site Visit</li> </ul>	X				

Ashley Laux	<ul style="list-style-type: none"> <li>Project Forester / Team Member / Virtual Site Visit</li> </ul>	X				
Caitlin Sellers	<ul style="list-style-type: none"> <li>Independent Peer Reviewer (Technical Reviewer)</li> </ul>					X
Trinh Thi My Dung	<ul style="list-style-type: none"> <li>Translator / In-Country Site Visit</li> </ul>		X			
Luu Hong Truong	<ul style="list-style-type: none"> <li>Regional Forestry Expert / In-Country Site Visit</li> </ul>		X			
Natalie Hammer	<ul style="list-style-type: none"> <li>Executive Services Administrator / Resource Manager</li> </ul>				X	

### 3.2 Validation schedule

Validation Activity/Milestone	Content (Explanation)	Delivery Date
Kick Off Call	Kick-off the validation and verification of the NCC ER Program	17 June 2021
VVB Initial Desk Review	Initial desk review to include preliminary review of documentation provided to inform our risk assessment and inputs into the Sampling Plan. If preliminary findings are discovered or documents are missing, Aster Global will notify FMT and ER Program Entity	28 June 2021
Sampling Plan v1 Submitted to NCC ER Program	Sampling Plan Submitted to NCC ER Program	30 July 2021
Signed Sampling Plan v1 submitted to Aster Global	NCC ER Program submitted signed Sampling Plan v1	17 August 2021
Audit Plan v1 Submitted to NCC ER Program	Audit Plan submitted to NCC ER Program	25 August 2021
FMT representatives return Draft Sampling Plan	Draft Sampling Plan with comments submitted to Aster Global	25 August 2021
Signed Audit Plan v1 submitted to Aster Global	NCC ER Program submitted signed Audit Plan v1	30 August 2021
Aster Global starts desktop review	VVB conducts desktop review and generates Findings as they proceed	30 August 2021
Logistics Meeting to discuss site visit	Logistics Meeting to discuss site visit	31 August 2021

Remote Sensing/Monitoring, Reporting and Verification Activity Data Meeting	The VVB met with members of the NCC ER Program to discuss aspects of the remote sensing analysis performed to collected activity data, remote sensing analysis as it relates to monitoring.	12 October 2021
Calculation walkthrough for Reference Level and Emission Factors Meeting	The VVB met with members of the NCC ER Program to discuss calculations related to the Reference Level which included but was not limited to activity data generation, sampling design, LULC classification, emission factor estimation.	26 October 2021
Logistics Meeting to discuss site visit	Logistics Meeting to discuss site visit	15 November 2021
In-Country site visit	Remeasurement of forest inventory plots, ground-truthing of various remote sensing analyses, selected interviews.	03-09 December 2021
Aster Global Issues Preliminary Round 1 Findings	Aster Global Issues Preliminary Round 1 Findings	15 December 2020
Aster Global Issues Round 1 Findings Meeting (2)	Aster Global Issues Round 1 Findings	07 January 2022
Follow up meeting to original round 1 findings meeting	Follow up meeting to original round 1 findings meeting	29 January 2021
NCC ER Program provide responses to Round 1 Findings and updated documents	Updated documentation, evidence and Findings responses provided to Aster Global	22 June 2022
Aster Global Issues Round 2 Findings	Aster Global Issues Round 2 Findings	23 August 2022
NCC ER Program provide responses to Round 2 Findings and updated documents	Updated documentation, evidence and Findings responses provided to Aster Global	20 December 2022
Aster Global Issues Round 3 Findings	Aster Global Issues Round 3 Findings	02 February 2023
NCC ER Program provide responses to Round 3 Findings and updated documents	Updated documentation, evidence and Findings responses provided to Aster Global	09 May 2023
Aster Global Issues Round 4 Findings	Aster Global Issues Round 4 Findings	31 July 2023
NCC ER Program provide responses to Round 4 Findings and updated documents	Updated documentation, evidence and Findings responses provided to Aster Global	06 September 2023
Aster Global drafts validation report and submits to Independent Peer Reviewer	Aster Global prepares draft validation plans using FCPF templates	28 September 2023
Draft validation/verification report is updated as needed and provided to the FMT and NCC ER Program representatives for review	Aster Global makes updates to report as needed after the Technical Reviewer is finished and then drafts are submitted to FMT and NCC ER Program representatives	29 September 2023

Aster Global issues final validation/verification report and statement (opinion)	Review of ER Program is complete.	03 October 2023
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### 3.3 Methodology description

#### Desktop Review:

The desktop validation component included a full, risk-based review of all ER Program documentation/calculations received from the NCC ER Program against the requirements and criteria of FCPF Carbon Program. The review focused on the ER Program Documents relative to the highest risk elements and complemented by interviews with ER program staff. ER Program details, implementation status, data and parameters, and quantification of GHG emission reductions and removals were thoroughly examined. Key supporting documents were also reviewed. These included, but were not limited to, monitoring data [i.e., remote sensing/Geographic Information System (GIS) data], Standard Operating Procedures (SOPs), geospatial boundaries, maps and aerial images, biomass and carbon calculations for emission sources/sinks, and the overall results of the MRV (Monitoring, Reporting, and Verification) system.

Review of the ER Program documentation and elements as part of the desktop review included, but was not limited to, assessment of the following aspects of the ER Program:

- Current conditions, for example the presence of deforestation and degradation, emissions factor adjustments, forest characteristics and reported biomass volume (above- and/or below-ground)
- Confirmed that operational, data collection procedures and monitoring methods were implemented in accordance with the SOPs as they are written
- Reviewed all program and strata boundaries (where applied)
- Interviewed management team, including a series of interviews with in-country staff that support the mission of the ER Program
- Confirmed organizational structure and operation
- Confirmed data management, compilation, and storage
- Confirmed the quality control and quality assurance procedures are in place

#### Remote Sensing:

NCC ER Program utilized remote sensing tools, including a satellite and land monitoring system, to produce estimates of the reference level and to generate the activity data. Geospatial data forms the basis for biomass and deforestation accounting estimates across landscapes, and therefore program integrity depends on a robust remote sensing assessment. The scope of the remote sensing review included *inter alia* the following:

- Expert judgement evaluation of remote sensing methods and implementation results
- Data selection suitability review: assessed the quality of acquired satellite data including review of minimum standards for remotely sensed analysis
- Reviewed classification results from Collect Earth including independent ground reference points as an indicator for accuracy
- Assessed the monitoring approach including data and methods
- Reviewed monitoring assumptions for inferences made using remotely sensed data and completeness checks on the analysis of drivers of emissions and removals
- Review of uncertainty propagation
- Selected independent data checks on analysis including, for example, accuracy assessment generation, classification results, etc.

Aster Global follows ISO 14064-3 and our management systems manual to apply a risk-based approach to the remote sensing review, concentrating on the likely sources of material misstatements. Aster Global performed the assessment of NCC ER Program compliance against the FCPF Methodological Framework requirements and associated guidelines (as applicable) with respect to remote sensing.

Based upon the information and documentation received from NCC ER Program to-date, the validation team completed our Strategic Analysis and Risk Assessment (SARA). SARA is a risk assessment that includes strategic analysis to make sure the V/V Team have considered:

- Regulatory requirements
- GHG program requirements
- Industry factors
- And other non-technical risks (i.e., health and security issues)

An ER Program-specific Validation Sampling Plan and Audit Plan were developed to guide the auditing process to ensure efficiency and effectiveness. The purpose of these documents was to present a risk assessment for determining the nature and extent of validation procedures necessary to ensure the risk of auditing error was reduced to a reasonable level. The plan methodologies were derived from all items in our validation process stated above. Specifically, these documents utilized the FCPF normative documents and ISO 14064-3. Any modifications applied to the plans were made based upon the conditions observed for monitoring to detect the processes with highest risk of material discrepancy.

The desktop validation component included a review of all ER Program documentation and calculations received from NCC ER Program, as described throughout this report.

Throughout the review process, the VVB issued both MCARs and mCARs to the ER Program to ensure compliance with the FCPF Carbon Fund requirements and normative documents. The ER Program subsequently responded with written responses, generally after an online meeting to discuss the CARs that were submitted, updated/corrected documentation, and/or provided additional supporting evidence. During the review process there were four formal sets of CARs submitted to the ER Program.

### 3.4 Review of documentation

A detailed review of all ER Program documentation was conducted to ensure consistency with and identify any deviation from FCPF program requirements.

Initial review focused on the Reference Level documentation, Monitoring Report (MR), and included an examination of the ER Program details, data and parameters, and quantification of GHG emission reductions and removals. Along with a review of the MR, selected documentation was requested, provided, and subsequently reviewed for consistency, accuracy, and appropriateness with regard to FCPF program requirements and methodological requirements. Documents reviewed included, but were not limited to, ER Program boundaries (Accounting Area), maps, aerial images (Activity Data), data from monitoring, reference level biomass and carbon calculation spreadsheets, and responses to Major and/or Minor CARs. The process of validation involved four formal rounds of assessment by the VVB and resulted in an ER Program that was in conformance with FCPF rules.

Please see Appendix 2 for a complete list of documents received and reviewed by Aster Global.

### 3.5 REDD Country Visit

As a result of the COVID-19 global pandemic, associated travel restrictions, and in consideration of the health of the validation team, client's staff, and ER Program participants, the core Aster Global team was unable to travel to Vietnam. Aster Global has developed Virtual Site Visit Procedures that allowed the validation team to reach a *reasonable* level of assurance regarding the NCC ER Program's compliance with FCPF program documents (as described in Section 2.3 of this report). As a result, Aster Global developed a hybrid approach to the site visit, which consisted of a series of virtual desktop meetings with the NCC ER Program and in-country portion of the site visit for which Aster Global contracted two in-country subcontractors to perform the necessary in-country site visit activities.



Our Virtual Site Visit Procedures have been prepared in consideration of IAF Informative Document for Management of Extraordinary Events or Circumstances Affecting ABs, CABs and Certification Organizations (Issue 1, IAF ID 3: 2011, 08 November 2011), IAF Mandatory Document For The Use of Information and Communication Technology (ICT) For Auditing/Assessment Purposes (Issue 2, IAF MD 4:2018, 04 July 2018), and ANAB Accreditation Rule 9 (Issue Date 01 January 2014). This procedure is not implemented at the sole discretion of Aster Global but in coordination with each protocol/registry/program/standard and the guidance (if provided) they have provided during extraordinary events or circumstances.

Definitions are provided to assist the reader.

Extraordinary Events or Circumstances: As defined by IAF ID 3:2011, a circumstance beyond the control of Aster Global or the clients, commonly referred to as an “act of God”. Examples include, but not limited to, hurricanes, flooding, tsunamis, earthquakes, volcanoes, threats of terrorism, malicious computer hacking, geopolitical tension, pandemic diseases, and crippling labor strikes, or other man-made / natural disasters.

Examples of the use of ICT during audits/assessments may include but are not limited to:

- Meetings by means of teleconference facilities, including audio, video, and data sharing
- Audit/assessment of documents and records by means of remote access, either synchronously (in real time) or asynchronously (when applicable)
- Recording of information and evidence by means of still video, video, or audio recordings
- Providing visual/audio access to remote or potentially hazardous locations

Information and Communication Technology (ICT): As defined by IAF MD 4:2018, ICT is the use of technology for gathering, storing, retrieving, processing, analyzing, and transmitting information. It includes software and hardware such as smartphones, handheld devices, laptop computers, desktop computers, drones, video cameras, wearable technology, artificial intelligence, and others. The use of ICT may be appropriate for auditing/assessment both locally and remotely.

Virtual Site Visit: Aster Global conducted a hybrid in-person/virtual site visit using ICT without physically going onsite and still being able to reach a *reasonable* level of assurance. As defined by IAF MD 4:2018, virtual location where a client organization performs work or provides a service using an on-line environment allowing persons irrespective of physical locations to execute processes.

The procedures of the ICT document were followed to determine a normalized validation and verification process. The COVID-19 global pandemic has made it difficult to ensure (or protect) the safety and health of our employees, subcontractors, client’s staff, and ER Program participants. The audit team determined that multiple audit activities can be conducted in a remote manner as the evidence needed to reach reasonable assurance is primarily digital in nature for this specific review. Regular coordination is handled via email and MS Teams, Skype or similar internet-enabled calling with the appropriate parties. An assessment of risk (on an ER Program basis) as to whether a virtual site visit can be conducted or if local subcontractors can be added to the validation/verification team is captured by the SARA table embedded within the Audit Plan. The following subset of topics are assessed for Virtual Site Visit:

What is being assessed	Type of ICT Used	Techniques Required to Reach Reasonable Assurance
Monitored Data and Parameters	Hard copy and screen-share of calculation worksheets, remotely sensed data, live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs, conference calls	Confirm appropriate default factors, parameters, formulae, and related inputs for calculations through independent data checks, professional judgement.  Aster Global met with the NCC ER Program on October 12 <sup>th</sup> and 26 <sup>th</sup> of 2021 to discuss the monitored parameters. Specifically, the

		monitoring system in place, remote sensed based activity data, and sampling designs.
Quantification of Emission Reductions	Hard copy and screen-share calculation worksheets, live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs, conference calls	<p>Confirm appropriate default factors, parameters, formulas, and related inputs for calculations through independent data checks, professional judgement.</p> <p>Aster Global met with the NCC ER Program on October 26<sup>th</sup> of 2021 to discuss the quantification of emission reductions.</p>
Reference Level	Calculation worksheets, remotely sensed data, live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs, conference calls	<p>Confirm appropriate parameters, formulas, and related inputs for calculations through independent data checks, professional judgement.</p> <p>Aster Global met with the NCC ER Program on October 12<sup>th</sup> and 26<sup>th</sup> of 2021 to discuss different aspects of the estimation of Reference Level emissions.</p>
Uncertainty	Calculation worksheets, remotely sensed data, live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs, conference calls	<p>Confirm appropriate default factors, parameters, formulas, and related inputs for calculations through independent data checks, professional judgement.</p> <p>Aster Global met with the NCC ER Program on October 26<sup>th</sup> of 2021 to discuss the estimation of uncertainty and to observe the R-code run.</p>
Remote Sensing	Calculation worksheets, remotely sensed data, live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs, conference calls	<p>A walk-through may or may be necessary as this review is primarily desktop based and is combination qualitative/quantitative.</p> <p>Aster Global met with the NCC ER Program on October 12<sup>th</sup> of 2021 to discuss the remote sensing related to activity data in the Reference Level and monitoring data.</p>
Process for QA/QC and Standard Operating Procedures (SOPs)	Live stream video teleconferencing (MS Teams, WebEx, Zoom, related) walkthroughs	Aster Global met with the NCC ER Program on October 12 <sup>th</sup> and 26 <sup>th</sup> of 2021 to discuss many different aspects of the NCC ER Program. Throughout these meetings, the validation team was able to see the process for the QA/QC of data and see if SOPs relating to data collection, etc., were followed.

#### In-Country Site Visit:

As previously discussed in this Section of the report, the core Aster Global Team was unable to perform the in-country site visit due to the global Covid-19 Pandemic. As a result, Aster Global contracted two sub-contractors (listed in Section 3.1 of this Report) within Vietnam to perform the in-country site visit as part of the VVB.

An in-country site visit plan was developed for the ER Program validation, as the in-country site visit is a tool to help the VVB reach reasonable assurance for various items within the scope of the validation. It also allowed the VVB to better understand the application of the carbon inventory methodology on-site, confirm the implementation of ER Program activities, and to identify possible sources of error to focus desktop validation efforts.

For the field sampling effort, direct measurement, observation of measurement, and review of any carbon losses in the key areas were determined to be the greatest risk. Plot re-measurement locations were selected and sampled based on access and safety.

The pool for measurement during the in-country site visit included Above Ground Biomass, specifically live trees. The VVB did not measure standing dead or lying dead as these pools have been conservatively excluded. Members of the VVB visited the pre-selected plots to observe re-measurement of the forest inventory plots to assess whether the stated forest inventory methodology and SOPs were implemented consistently and appropriately. Effort was made to ensure plot re-measurement was performed in an unbiased manner using the inventory methodology and best practices for forest measurement. The VVB watched inventory teams conduct re-measurement to ensure SOPs were implemented appropriately and consistently. The VVB also selected inventory plots where QAQC procedures were implemented and watched the QAQC team remeasure these plots to ensure QAQC SOPs were implemented appropriately and consistently.

Based on in-depth discussions with the ER Program, the audit team understood that the Covid-19 situation in Vietnam worsened prior to the site visit, and there were substantial in-country travel restrictions and quarantine times that needed to be considered for the site visit. Additionally, the site visit was conducted during the rainy season, making plot access more difficult and impossible for certain plot clusters. As a result, the audit team was able to collect data on 3 different clusters for a total of 7 plots. The following table shows the resulting plots and clusters visited.

Plot Count	Cluster ID	Plot ID
1	1358	2
2	1358	1
3	1358	4
4	1341	2
5	1341	3
6	1252	4
7	1252	1

#### Ground-truthing Remotely Sensed Data:

During the site visit various points were opportunistically sampled by the audit team at ground level. The audit team reviewed the sampled points (utilizing georeferenced photos) to assess the accuracy of stratification and LULC classification.

#### Interviews:

The majority of interviews were conducted virtually to minimize safety concerns as a result of the Covid-19 pandemic. However, the audit team conducted some in-person interviews to assess various criteria referenced in the Validation and Verification Guidelines Version 2.3. Specifically, the audit team interviewed the inventory crews to assess their qualifications and training that they received and inventory crews who conducted the QA/QC assessments of the forest inventory.

## 4. VALIDATION OF ER PROGRAM DESIGN

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### 4.1 Completeness of Report

After review of all ER Program information, procedures, calculations, and supporting documentation, Aster Global confirms that Annex 4 contains the required updated information, specific to the validation. As directed by the scope of the validation, an audit of the ERPD was outside the scope of the validation.

### 4.2 Start date of the crediting period

The Start Date of the Crediting Period is 01 January 2018. The audit team confirmed that the selected date and evidence provided is in compliance with the definition of the Start Date of the Crediting Period provided in the *FCPF Glossary of Terms*.

### 4.3 Sources and Sinks

As this is outside the scope of the validation, this section is intentionally left blank.

### 4.4 Carbon pools and GHG

As this is outside the scope of the validation, this section is intentionally left blank.

### 4.5 Reference Period

As this is outside the scope of the validation, this section is intentionally left blank.

### 4.6 Forest Definition

As this is outside the scope of the validation, this section is intentionally left blank.

### 4.7 Calculation of average annual historical emissions

After review of all ER Program information, procedures, calculations, and supporting documentation, Aster Global confirms that the NCC ER Program made a systematic and step-by-step assessment of the methods, assumptions, and approaches used for the calculation of historical emissions, i.e., the Reference Level. Furthermore, Aster Global confirms that all equation parameters and fixed data are appropriately linked to the equations used for the quantification of the Reference Level.

### 4.8 Activity data and emission factors

#### 4.8.1 Activity data

Aster Global confirmed the reliability of the source and nature of the reported evidence justified the selection of the monitored data and parameters and that all parameters related to activity data and described below have been reported in line with guidelines provided in the template. Further, Aster Global confirmed the correctness of each step of monitoring, from measurement to data transfer and calculation, and confirmed the information for each parameter is complete and also that the stated parameters are free of error and material misstatements. Aster Global further confirmed that methodological steps and data were publicly available in accordance with applicable criteria. Aster Global confirms that the evidence provided by the ER Program to is sufficient and appropriate to determine the GHG reductions and removals.

The Activity Data comes from a series of historical forest cover maps for 2005, 2010, and 2015. Land use changes are estimated by overlaying successive time series maps and adjusted for bias with the accuracy assessment by following the method of Olofsson et al. (2014). Publicly available sources for Activity data and Accuracy Assessment are available at <http://vnff.vn/> by selecting "Data" under "ERPA PROGRAM" within the webpage's primary menu. Assessment details are as follows:

<b>Parameter</b>	$AD_{t1,t2,i,j}$
<b>Description</b>	Area of land use and land cover conversion from type $i$ in year $t1$ to type $j$ in year $t2$ . Types $i$ and $j$ run from 1 to 6 and mean as follows: 1. Evergreen broadleaf forest, rich (EBF_R); 2. Evergreen broadleaf forest, medium (EBF_M); 3. Evergreen broadleaf forest, poor (EBF_P); 4. Other forests (OFO); 5. Plantation (PLA); and 6. Non-forest lands (NOF)
<b>Free of Material Misstatement (Yes/No)</b>	Yes
<b>Reported Appropriately (Yes/No)</b>	Yes
<b>Assessment Details</b>	<p>Activity data that form the basis of this parameter are based on annual historical time series analysis of land-use and forest type change across the Accounting Area. The validation team conducted an independent land cover classification analysis on Google Earth Engine (GEE) with similar remotely sensed data to confirm that the source data was reliable and appropriate. Additionally, the audit team was able to ensure that LULC classification was appropriate and followed the pre-defined classification system.</p> <p>The validation team conducted independent data checks for each step necessary for the quantification of this parameter. Independent data checks were used to ensure that the quantification of the parameter was performed correctly. This included an independent review of the literature cited in reference to the applied equations.</p> <p>Spatial analyses conducted in ESRI ArcGIS confirmed the geographical boundary, ensuring that all activity data fell within the Accounting Area and that the Accounting Area was computed correctly. The calculation of uncertainty applied the methodology from Olofsson, et al. (2014). A sample of accuracy points were examined within the Collect Earth program to check the uncertainty associated with land use and land cover conversion.</p>

#### 4.8.2 Emission Factors

Aster Global confirmed the reliability of the source and nature of the reported evidence justified the selection of the monitored data and parameters that all parameters related to activity data and described below have been reported in line with guidelines provided in the template. Further, Aster Global confirmed the correctness of each step of monitoring, from measurement to data transfer and calculation, and confirmed the information for each parameter is complete and that the stated parameters are free of error and material misstatements. Aster Global also confirmed that methodological steps and data were publicly available in accordance with applicable criteria. The source of emission factors is from field collected data and IPCC Guidance and Guidelines, and emission factors were calculated based on a set of equations from scientific literatures. Publicly available sources can be accessed at <http://vnff.vn/erpa-program/data/emission-factors?hl=en>. Assessment details are as follows.

<b>Emission Factors</b>	$AGB_{t,i}$ ( $t = 2005, 2010$ or $2015; 1 \leq i \leq 5$ )
<b>Description</b>	Forest above-ground biomass densities of LULC type $i$ in year $t$ . The values of $i$ mean: 1. EBF_R; 2. EBF_M; 3. EBF_P; 4. Other forests; and 5. Plantation.
<b>Free of Material Misstatement (Yes/No)</b>	Yes

<b>Reported Appropriately (Yes/No)</b>	Yes
<b>Assessment Details</b>	<p>Carbon density for the NCC ER Program is estimated by total biomass of individual trees and bamboos, where Above Ground Biomass (AGB) and Below Ground Biomass (BGB) define total biomass. Calculation of AGB is based on DBH for individual trees and DBH &amp; HT for bamboos from existing literature (Huy, 2014; Phuong <i>et al.</i>, 2014), whereas IPCC 2006 default values are applied to estimate Below Ground Biomass (BGB). Calculation of AGB uses datasets from the National Forest Inventory Monitoring and Assessment Program (NFIMAP), which received funding from FAO-Finland and of which the sampling design was audited by the United States Forest Service and the World Bank. As part of the Field Visit and described in Section 3.5 of this report, the validation team witnessed the inventory crews re-sample forest inventory plots to ensure the inventory SOPs and measurements were conducted in-line with the stated SOPs. Additionally, the validation team interviewed various members of the inventory team to determine their level of qualification and ensure that minimum qualifications were satisfied.</p> <p>The validation team conducted independent data checks for each step necessary in the quantification of this parameter and an independent review of the literatures cited in reference to each equation in the calculation procedure. The uncertainty associated with this parameter was also independently calculated after a thorough review of the quantification code. The validation team confirmed that the uncertainty was correctly calculated in line with the sampling design. In addition, the validation team reviewed sampling design protocol, QA/QC SOPs, and QA/QC results and confirmed the appropriateness of each.</p>

## 4.9 Adjustments to the average annual historical emissions over the reference period

As stated in Section 8.5 of Annex 4 of the MR, the ER Program has not applied any adjustment to the Reference Level. Therefore, this section is intentionally left blank.

## 4.10 Estimated Reference Level

As stated in Section 4.8 (Activity data and emission factors) of this report, the validation team conducted a validation of Reference Level (e.g., activity data, emission factors) using similar historical time series remotely sensed data of land-use change and forestry across the Accounting Area. The validation team conducted an independent land cover classification analysis on Google Earth Engine (GEE) with similar remotely sensed data to confirm the source data was reliable and appropriate. Additionally, the audit team was able to ensure that LULC classification was appropriate and followed the pre-defined classification system. A sample of accuracy points were examined within the Collect Earth program to check the uncertainty associated with land use and land cover conversion.

Crediting Period year <i>t</i>	Average annual historical emissions from deforestation over the Reference Period (tCO <sub>2</sub> e/yr)	If applicable, average annual historical emissions from forest degradation over the Reference Period (tCO <sub>2</sub> e/yr)	If applicable, average annual historical removals by sinks over the Reference	Adjustment, if applicable (tCO <sub>2</sub> e/yr)	Reference level (tCO <sub>2</sub> e/yr)

			Period (tCO <sub>2</sub> e/yr)		
2018	2,646,198	10,263,974	-6,648,726	NA	6,261,446
2019	2,646,198	10,263,974	-6,648,726	NA	6,261,446
<b>Total</b>	<b>5,292,396</b>	<b>20,527,948</b>	<b>-13,297,452</b>	<b>NA</b>	<b>12,522,892</b>

## 4.11 Consistency of the Program's Reference Level with national FREL/FRL and GHG Inventory

As this is outside the scope of the validation, this section is intentionally left blank.

## 4.12 Uncertainty of the Reference Level

### 4.12.1 Identification and assessment of sources of uncertainty

Uncertainty was assessed as required by the FCPF Validation and Verification Guidelines. The validation team recalculated the uncertainty statistics independently to confirm the accuracy of the reported precision, reviewed assumptions and sources associated with parameters used in the quantification, and reviewed uncertainty of the emission reductions. Aster Global confirms that the sources of uncertainty are systematically identified and correctly assessed in the Reference Level, Monitoring, and Reporting. Additionally, Aster Global confirms that there is an appropriate process of reducing uncertainty in the activity data and emission factors, where possible.

### 4.12.2 Uncertainty of the estimate of the Reference Level

The uncertainty estimate for the Reference level strictly follows the guidelines of Approach 2: Monte Carlo simulation from 2006 IPCC Volume 1 General Guidance and Reporting Chapter 3. Random samples were generated from Monte Carlo simulation using Excel program for both activity data and emission factors. The distributions of activity data and emission factors were assumed to be normal.

To ensure the accuracy of uncertainty estimates for the Reference Level, the Monte Carlo simulation was based on 10,000 random permutations. Additionally, carbon fraction and root-to-shoot ratio were randomly generated, but the ratio of molecular weights was fixed to 3.67. Finally, the distribution of the Reference Level was determined by multiplying activity data, emission factors, carbon fraction, and ratio of molecular weights to generate distribution of total emissions. The uncertainty was evaluated at 90% confidence interval.

The validation team reviewed and confirmed the above-mentioned elements related to the estimation of uncertainty for the Reference Level were all addressed in the provided quantification code. The validation also confirmed that the quantification code ran without any error and that the results matched the Reference Level included in the Monitoring Report. Therefore, Aster Global concludes that the application of Monte Carlo simulation for the quantification of Uncertainty of the Reference Level was performed correctly.

### 4.12.3 Sensitivity analysis and identification of areas for improvement of the MRV system

Sensitivity analysis was conducted by fixing the following parameters: AGB, activity data, root-to-shoot ratio, and carbon fraction. These parameters were fixed to generate emission reductions, and the emission reductions were compared against the emission reduction from the Monte Carlo simulation. The widths of confidence intervals for each fixed parameter emission reduction and the emission reduction from Monte Carlo simulation were compared. Fixing AGB appeared to have the highest reduction of confidence interval, meaning that a large portion of the emission reduction uncertainty is explained by the AGB uncertainty followed by activity data.

The validation team reviewed and confirmed the above-mentioned elements related to the sensitivity analysis were all addressed in the provided quantification code. The validation team also confirmed that the quantification code ran without any error, and the results matched the sensitivity analysis included in the monitoring report. Therefore, Aster Global concludes that the application of the sensitivity analysis was performed correctly.

#### **4.13 Data quality and availability**

The validation team closely followed the steps and re-calculated the Reference Level described in the monitoring report and related calculations files (e.g., Excel spreadsheets, R script) and confirmed that the steps were described in detail to reconstruct the Reference Level without any difficulty. The validation team also confirmed that the quantification code to reconstruct the Reference Level ran without any error, and the results matched the output included in the monitoring report.

Additionally, the validation team confirmed that the publicly available online sources related to the Reference Level were included in the monitoring report. The addresses for websites are provided in the monitoring report, e.g., <http://vnff.vn/?hl=en>. While some information such as forest inventory data (e.g., individual tree data), R script, or materials containing confidential information is not publicly available online, this information has been fully provided to the validation team to be reviewed as part of the validation.

Therefore, Aster Global concludes that the quality and description of the documented data and methods are detailed enough to enable the reconstruction of the Reference Level.

## 5. NON-COMPLIANCES AND OBSERVATIONS

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During the validation process, there was a risk that potential errors, omissions, and misrepresentations would be found. The actions taken when errors, omissions, and misrepresentations were found included notifying the client of the issues identified and expanding our review/sample to the extent that satisfied the Team Leader's professional judgment.

This validation involved four (4) formal rounds of assessment by the validation team and resulted in a Reference Level and Monitoring Report that is in conformance with FCPF rules. Where findings were noted by the validation team, the NCC ER Program implemented corrective actions by amending the MR and supporting documentation/calculations and providing written clarification responses. Types of findings were characterized in the following manner:

Major Correction Action Requests (MCARs) were, in general, issued as a response to material discrepancies when:

- the evidence provided to demonstrate conformity is insufficient, unclear or not transparent and may lead to a material error, omission or misstatement, and/or a breakdown in the systems delivery;
- underlying assumptions used to develop the reported estimates are not supported by data;
- material errors, omissions or misstatements have been made in applying assumptions, in data or calculations;
- non-compliance with Validation and Verification criteria;
- the REDD+ Country Participant has failed to implement or made inadequate progress with the mCARs from the previous verifications;

Minor Correction Action Requests (mCARs) were, in general, issued when:

- the evidence provided to demonstrate conformity is insufficient, unclear or not transparent, but does not lead to a material error, omission or misstatement, and/or a breakdown in the systems delivery;
- non-material errors, omissions or misstatements have been made in applying assumptions, in data or calculations;

Observations (OBS) were issued when:

- there is no objective evidence to prove that there is a non-conformity, but the VVB observes practices and/or methods that could result in future MCARs and mCARs;
- the VVB wishes to identify an area of the Forest Monitoring System that requires attention and/or adjustment in future monitoring and reporting.

During the course of the validation and verification, 25MCARs, 1 mCARs, and 0 observations were identified. All MCARs were satisfactorily addressed by the NCC ER Program, while the NCC ER Program opted not to respond to the mCAR. Per the FCPF Validation and Verification Guidelines, the ER Program has until the time of the next verification to close out the 1 mCAR issued. These findings provided necessary clarity to ensure the ER Program adhered to the requirements of the FCPF for GHG programs. For a complete list of all findings and their resolutions, please refer to Appendix 1.

## APPENDIX 1: OVERVIEW OF NON-COMPLIANCES & OBSERVATIONS ISSUED DURING THE VALIDATION BY THE VALIDATION TEAM

<b>Finding Number</b>	1
<b>Carbon Methodological Framework Version 3, April 2020</b>	Criterion 6: Key data and methods that are sufficiently detailed to enable the reconstruction of the Reference Level, and the reported emissions and removals (e.g., data, methods and assumptions), are documented and made publicly available online. In cases where the country's or ER Program's policies exempt sources of information from being publicly disclosed or shared, the information shall be made available to the third party validation and verification body and a rationale is provided for not making these data publicly available. In these cases, reasonable efforts shall be made to make summary data publicly available to enable reconstruction.
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	EF_2010_2019.xlsx / 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx / Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf
<b>Aster Global Findings - Round 1</b>	The provided files "EF_2010_2019.xlsx / 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx" are insufficient to enable the reconstruction of the Reference Level, and the reported emissions and removals. Some relevant information is documented and made publicly available online at the FCPF website but the VNFOREST/MMR system stated in the MR does not suggest any specific documents or publicly available website.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please specify any documents or publicly available websites in "Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf".
<b>Round 1 Response from Client</b>	We have re-arranged the information related to the ERPD and MMR1 and they are all published on VNFF's website (English page: QUỸ BẢO VỆ VÀ PHÁT TRIỂN RỪNG VIỆT NAM: <a href="http://vnff.vn/?hl=en">http://vnff.vn/?hl=en</a> . The information containing all data for RL, and MR is arranged (under ERPA PROGRAM) in the following folders: <ul style="list-style-type: none"> <li>•ERPD: include the documents: submitted ERPD, annexes of ERPD, cover letter and emission reduction payment agreement.</li> <li>•MMR1 2018-2029 (typo): include the documents: MMR1, activity data (including maps in shape files), EF (excel files and report), MC analysis (excel file)</li> <li>•Safeguard</li> </ul>
<b>Aster Global Findings - Round 2</b>	The Audit team reviewed the MR and notes that the links on page 6 and 7 of the MR appear not to work.  Similarly, it appears that only the EF data for 2019 is publicly available and it is unclear why the rest of the data that is needed to create the EF for the Reference Level are not made publicly available.

<b>Round 2 NCR/CL/OFI</b>	MCAR: Please ensure that all links within the MR work and that all the data in-line with this criteria are made publicly available.
<b>Round 2 Response from Client</b>	We have fixed the link errors and they are now working. All the links are updated in the MMR1.  For convenience, <b>we have prepared the doc file named "15.12.22_ Weblinks to ERP data"</b> which provides all weblinks to VNFF homepage in English and specific information.
<b>Aster Global Findings - Round 3</b>	The VVB further confirmed that EF data from 2005 to 2019 including EF reports, and QA/QC data and reports are publicly available via the link included in the MR. However, The audit team found broken links within Vietnam MMR1_Final 20.12.2022.docx, including: <a href="http://sis.vietnam-redd.org/">http://sis.vietnam-redd.org/</a> ; <a href="http://vnff.vn/erpa-program">http://vnff.vn/erpa-program</a> ; <a href="https://www.usaid.gov/vietnam/documents/vietnam-forests-and-deltas-program">https://www.usaid.gov/vietnam/documents/vietnam-forests-and-deltas-program</a> ; <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis">http://vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis</a> ; <a href="https://snv.org/cms/sites/default/files/explore/download/vfd_sl_success_story_climate_smart_livelihoods.pdf">https://snv.org/cms/sites/default/files/explore/download/vfd_sl_success_story_climate_smart_livelihoods.pdf</a> .
<b>Round 3 NCR /CL/OFI</b>	MCAR: Please ensure all hyperlinks in the MR are navigable.
<b>Round 3 Response from Client</b>	We have corrected and all links have been corrected and they are fully operational
<b>Aster Global Findings - Round 4</b>	The VVB confirmed all links have been corrected and are functioning.

<b>Finding Number</b>	2
<b>Carbon Methodologi cal Framework Version 3, April 2020</b>	Indicator 6.2: For the following spatial information, maps and/or synthesized data are displayed publicly, and reasonable efforts are made to explain how these were derived from the underlying spatial and other data, and to make key data sets or analyses publicly available:
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents</b>	Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf
<b>Aster Global Findings - Round 1</b>	Some relevant information is documented and made publicly available online at the FCPF website but the VNFOREST/MMR system stated in the MR does not suggest any specific documents or publicly available website.

<b>Round 1 NCR/CL/OFI</b>	CL: Please specify any documents or publicly available websites in "Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf" regarding this requirement.
<b>Round 1 Response from Client</b>	We have re-arranged the information related to the ERPD and MMR1 and they are all published on VNFF's website (English page: QUỶ BẢO VỆ VÀ PHÁT TRIỂN RỪNG VIỆT NAM: <a href="http://vnff.vn/?hl=en">http://vnff.vn/?hl=en</a> . The information containing all data for RL, and MR is arranged (under ERPA PROGRAM) in the following folders: <ul style="list-style-type: none"> <li>•ERPD: include the documents: submitted ERPD, annexes of ERPD, cover letter and emission reduction payment agreement.</li> <li>•MMR1 2018-2029 (typo): include the documents: MMR1, activity data (including maps in shape files), EF (excel files and report), MC analysis (excel file)</li> <li>•Safeguard</li> </ul>
<b>Aster Global Findings - Round 2</b>	The Audit team reviewed the MR and notes that the links on page 6 and 7 of the MR appear not to work.  Similarly, it appears that only the EF data for 2019 is available and it is unclear why the rest of the data that is needed to create the EF for the Reference Level are not made publicly available.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please ensure that all links within the MR work and that all the data in-line with this criteria are made publicly available.
<b>Round 2 Response from Client</b>	Yes, we have fixed and all data are available on VNFF website.  For convenience, <b>we have prepared the doc file named "15.12.22_Weblinks to ERP data"</b> which provides all weblinks to VNFF homepage in English and specific information.
<b>Aster Global Findings - Round 3</b>	The VVB further confirmed that EF data from 2005 to 2019 including EF reports, and QA/QC data and reports are publicly available via the link included in the MR. This finding is closed.
<b>Round 3 NCR /CL/OFI</b>	MCAR: Please ensure all hyperlinks in the MR are navigable.
<b>Round 3 Response from Client</b>	We have corrected and all links have been corrected and they are fully operational
<b>Aster Global Findings - Round 4</b>	The VVB confirmed all links have been corrected and are functioning.

<b>Finding Number</b>	<b>3</b>
<b>Carbon Methodologi cal Framework Version 3, April 2020</b>	Criterion 14: Robust Forest Monitoring Systems provide data and information that are transparent, consistent over time, and are suitable for measuring, reporting and verifying emissions by sources and removals by sinks, as determined by following Criterion 3: within the proposed Accounting Area.
<b>Requirement Met</b>	Y

<b>(Y, N, or Pending)</b>	
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf
<b>Aster Global Findings - Round 1</b>	<p>Robust Forest Monitoring Systems are maintained, and "Figure 1, Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf" provides the organizational structure, responsibilities and competencies of agencies associated with the Measurement, Monitoring, and Reporting Emission and Removals.</p> <p>The audit team reviewed the MR to better understand the QA/QC procedures of the field measurements. The audit was not provided QA/QC results of the field measurements. The audit team is requesting the QA/QC data that was collected. Additionally, the MR states ". Differences in measurements between QA/QC team and field team are stated, and unclear issues are clarified. It must be taken into account that every field team is controlled. The reports can be used for evaluating reliability of the field data. Measurements that were found to be difficult shall be emphasized in future training." The VVB is requesting to view these reports.</p> <p>Transparency in the calculation of the Emissions Reductions, including the Reference Level are critical pieces to the audit process. However, the audit team noted that sources for reference level calculations were not provided. Additionally, the calculations for this crediting period (e.g. R coding and 2019 AGB in the MR) do not match the numbers in the MR. Please provide the exact sources or update the calculations so that calculations be matched to the numbers in the MR.</p>
<b>Round 1 NCR/CL/OFI</b>	<p>MCAR: Please provide the evidence requested in the finding.</p> <p>MCAR: Please provide all necessary files to recreate the RL, all Efs (2005, 2010, 2015), all Activity Data (and associated maps), and the emissions reductions calculations.</p>

**Round 1  
Response  
from Client**

The QA/QC data and reports (only in Vietnamese) for field data of NFIMAP cycle 5 are available on the VNFF website: <http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-> (item “QAQC data and reports”). All QA/QC reports can be downloaded from this link:

[https://drive.google.com/drive/folders/1Aiq7qA\\_nVQz4\\_xziW7hZkvOxfOW-PLcV?usp=sharing](https://drive.google.com/drive/folders/1Aiq7qA_nVQz4_xziW7hZkvOxfOW-PLcV?usp=sharing) or: Emission factor (including QA/QC): <http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-/ef-data-2019?hl=en>.

**Regarding the transparency it is explained as follows:**

- The MR has been updated with new AGB densities and uncertainties to match which the results from the R code. All the data, R code, excel worksheet and reports related to FREL/FRL development as well as ER calculations for the crediting period are available on VNFF website: <http://vnff.vn/>. In particular:
  - The ERPD is available at: <http://www.vnff.vn/erpa-program/erpd/erpd> (item “Emission Reduction Program Document (ERPD)”).
  - The annexes on AD, EF, and FREL/FRL development are available at: <http://vnff.vn/erpa-program/erpd/annex-of-erpd> (items “Annex 4\_AD report”, “Annex 5\_EF report” and “Annex 6\_FREL report”).
  - The first MR reports are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/mmr1> (items “ER Monitoring report (ER-MR) updated 12.4.22” and “2021\_Vietnam FCPF 1st ER monitoring report”).
  - The maps for generating the AD for FREL/FRL development as well as ER calculations for the crediting period are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019> (items “NCC\_AD\_REL\_MMR revised” and “NCC\_map”).
  - The AD for period 2015-2019 are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-data> (item “AD\_data”).
  - The uncertainties assessment worksheet is available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/accuracy-assessment-data> (item “NCC\_AD\_accuracy\_final\_hung\_v3\_11.4.22”).
  - The SOPs for AD generation and SAE implementation are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/sop-data> (item “SOP”).
  - The report on calculation of AGB densities and their associated uncertainties for FREL/FRL development as well as ER calculations for the crediting period are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-> (item “Emission Factor 2010-201\_v5\_s5\_Eng 11.4.22”).
  - The field data and R code for calculating the AGB densities and their associated uncertainties for FREL/FRL development and ER calculations for the crediting period, as well as the calculated results are available at: <http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-> (item “Emission Factor (EF)\_excel file”). The QA/QC data and reports (only in Vietnamese) for field data of NFIMAP cycle 5 are available on the VNFF website: <http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-> (item “QAQC data and reports”).
- The Excel worksheet for calculating the FREL/FRL, the ER for the first reporting period and the integrated uncertainties using Monte-Carlo analysis is available at: [www.vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis?hl=en](http://www.vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis?hl=en)

The latest file named “01\_Updated Vietnam\_M.C Analysis Phuong 22 April 2021 - Final\_Auto sensitivity analysis\_28.03.2022 Hung\_10.04.2022\_v2\_Phuong 01.06.22”

<b>Aster Global Findings - Round 2</b>	<p>MCAR: Thank you for your response. In “NCC_AD_accuracy_final_Hung_v3_11.04.22, tabs (5.Accuracy_assessment_15-19_new, 5.Accuracy_assement_05-10, and 5.Accuracy_assement_10-15)” it is not clear to the audit team how the error matrices are generated.</p> <p>The audit team reviewed the additional files related to the quantification of EF. However, the audit team notes that the plot data is only available for 2017-2019 and not the earlier cycles that are used in the quantification of the RL.</p>
<b>Round 2 NCR/CL/OFI</b>	<p>MCAR: Please provide the audit team with the necessary files (including accuracy point shapefiles) to reproduce the error matrix shown in the worksheet.</p> <p>MCAR: Please ensure that all files needed to recreate the RL are provided to the audit team and made publicly available.</p>
<b>Round 2 Response from Client</b>	<p>MCAR 3.2.1: MCAR 3.2.1: The accuracy point shapefiles and other relevant files to reproduce the error matrix are available at: <a href="http://vnff.vn/erpa-program/data/accuracy-assessment?hl=en">http://vnff.vn/erpa-program/data/accuracy-assessment?hl=en</a>.</p> <p>MCAR 3.2.2: The plot data for cycles 3, 4 and 5 that are used in the quantification of the RL are available available at: <a href="http://vnff.vn/erpa-program/data/emission-factors?hl=en">http://vnff.vn/erpa-program/data/emission-factors?hl=en</a>. The weblinks to maps is: <a href="http://vnff.vn/erpa-program/data/maps?hl=en">http://vnff.vn/erpa-program/data/maps?hl=en</a>; and weblinks to AD is <a href="http://vnff.vn/erpa-program/data/activity-data?hl=en">http://vnff.vn/erpa-program/data/activity-data?hl=en</a>.</p> <p>For convenience, <b>we have prepared the doc file named "15.12.22_Weblinks to ERP data"</b> which provides all weblinks to VNFF homepage in English and specific information.</p>
<b>Aster Global Findings - Round 3</b>	<p>MCAR 3.2.1: Accuracy assessment files are provided to the audit team. Error matrix in the activity data calculation worksheet has been confirmed. <b>This finding is closed.</b></p> <p>MCAR 3.2.2: The audit team confirmed that plot data are provided to the audit team and publicly made accessible at <a href="http://vnff.vn/erpa-program/data/emission-factors?hl=en">http://vnff.vn/erpa-program/data/emission-factors?hl=en</a>. <b>This finding is closed.</b></p>

<b>Finding Number</b>	<b>4</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	<p>Indicator 14.1: The ER Program monitors emissions by sources and removals by sinks included in the ER Program’s scope (Indicator 3.1:) using the same methods or demonstrably equivalent methods to those used to set the Reference Level.</p>
<b>Requirement Met (Y, N, or Pending)</b>	<p>Y</p>
<b>Evidence Used to Assess</b>	<p>Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf</p>

<b>(Location in PD, MR or Supporting Documents</b>	
<b>Aster Global Findings - Round 1</b>	<p>The same monitoring systems is maintained for this reporting period equivalent to reference period, and "Figure 1, Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf" provides the organizational structure, responsibilities and competencies of agencies associated with the Measurement, Monitoring, and Reporting Emission and Removals.</p> <p>1. The audit team reviewed the LUC 2019 tab of the NCC_AD_accuracy_final.xlsx workbook and was unable to confirm the values.</p> <p>2,3. During the course of interviews with the ER Program, it was described that multiple different inventory plot sampling designs have been utilized. There is not mention these changes in the MR. Additionally, the audit team was unable to confirm that this Indicator is satisfied.</p> <p>4. The audit team recreated the NCC tab of the NCC_AD_accuracy_final.xlsx workbook using the NCC_BD_2015_2019_final.shp shapefile. The audit team found significantly different values than what are reported in the NCC tab of the NCC tab of the NCC_AD_accuracy_final.xlsx workbook.</p> <p>5. The audit has not been provided the activity data for the Reference Level.</p>
<b>Round 1 NCR/CL/OFI</b>	<p>MCAR 1: Please clarify where these values come from and how they are calculated. If there is a reference shapefile/raster file that uses these calculations please provide it.</p> <p>MCAR 2: Please add additional information the MR so the audit team can better understand how the Inventory sampling design has changed overtime.</p> <p>MCAR 3: As a result of the Inventory Sampling design changing overtime it is unclear to the audit team how this criteria is satisfied.</p> <p>MCAR 4: Please recalculate the values noted in finding 4 or clarify which shapefile should be used for this calculation. If the ER Program finds that values have been miscalculated, please update all downstream calculations.</p> <p>MCAR 5: Please provide all relevant activity data, maps, and calculations for the audit team to recreate the Reference Level (including Emission Factors).</p>

<b>Round 1 Response from Client</b>	<p>For MCAR 1: Client has re-uploaded the shapefile of AD 2015-2019 that corresponds with the value coming from the file NCC_AD_accuracy_final.xlsx and 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx. The file is available at: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019">http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019</a> (item "NCC_map").</p> <p>As for MCAR2: Descriptions of multiple different inventory plot sampling designs utilized in NFIMAP have been added to the MR (in the field "Source of data and description of measurement/calculation methods and procedures applied:" of the AGB densities parameter on pages 18-19 of the MR).</p> <p>MCAR3: The above explanation has been added to the MR (Section 3.2 Monitored Data and Parameters =&gt; Monitoring emission factors: =&gt; Source of data and description of measurement/calculation methods and procedures applied:) to demonstrate that the indicator 14.1 is still satisfied.</p> <p>MCAR 4: Similar to Q4.1., the Client has recalculated and re-provided the AD data related with calculation to be consistent with all spatial data and worksheet provided. The shape file of AD 2015-2019 is available at: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019">http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019</a> (item "NCC_map"). The original NCC_AD_accuracy_final.xlsx workbook has been replaced by the file NCC_AD_accuracy_final_hung_v3_11.4.22.xlsx workbook at <a href="http://vnff.vn/erpa-rogram/mmr1-2018-2029/activities-data-ad-/accuracy-assessment-data">http://vnff.vn/erpa-rogram/mmr1-2018-2029/activities-data-ad-/accuracy-assessment-data</a> (item "NCC_AD_accuracy_final_hung_v3_11.4.22")</p> <p>MCAR5: All relevant AD, maps, and calculations used for construction Reference Level are available on the VNFF's website. The provided link to this is provided above:</p> <ul style="list-style-type: none"> <li>o AD: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-data">http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-data</a></li> <li>o Maps: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019">http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019</a></li> <li>o EF: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-/ef-data-2019">http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-/ef-data-2019</a></li> </ul>
<b>Aster Global Findings - Round 2</b>	<p>MCAR 1, 4 and 5: Thank you for your response. The audit team reviewed AD 2015_2019 shapefile and calculated the change in stratum area independently using the same Projection System in which the shapefile is based (i.e., WGS 1984 UTM Zone 48N). However, the audit team computed different areas than what is reported. This also applies to the years 2005_2010 and 2010_2015.</p> <p>MCAR 2 and 3: Thank you for the additional information. The audit team reviewed the updated MR and found that although the sampling designs. These findings are marked pending of other findings related to the quantification of EFs.</p>
<b>Round 2 NCR/CL/OFI</b>	<p>MCAR: Please explain why this discrepancy occurred in area computation when using the same Projection System as the shapefile. In addition, please provide the audit team with change shapefiles for 2005-2010 and 2010-2015 in order to generate the "time series forest cover change table".</p>

<b>Round 2 Response from Client</b>	<p>MCAR 4.2.1: - When the client worked with spatial data from different sources (forest cover maps of 2005, 2010, and 2019 and the change map) observed different area calculations (due to forest cover data in different periods). The difference was 25.000 ha approx. (0.04% per total area of NCC), so to keep consistency (total area of NCC in 2005, 2010, 2015 and 2019 and the change map), the area has been adjusted to the same value of 5.144.520 ha; and this leads to the discrepancy occurred in the area computation and the 'Dtich' field used in the reporting. Please confirm what differences the audit team found by year and by stratum to confirm the responses provided is accurate.</p> <p>Maps (forest cover map and Activity Data map) available at: <a href="http://vnff.vn/erpa-program/data/maps?hl=en">http://vnff.vn/erpa-program/data/maps?hl=en</a></p> <p>Activity data (AD 2005-2010; AD 2010-2015; AD 2015-2019) available at: <a href="http://vnff.vn/erpa-program/data/activity-data?hl=en">http://vnff.vn/erpa-program/data/activity-data?hl=en</a></p>
<b>Aster Global Findings - Round 3</b>	<p>The audit team acknowledges the area adjustment as the source of the disparity in the area computed based on the provided shapefiles and confirmed that the difference was approx. 25000 ha.</p> <p>Additionally, the audit team noted that the template was not follow or has been changed in multiple sections. Specifically, in Section 5.2 the uncertainty discount referenced in line F appears to be incorrect. In Section 8, the current MMR changes the template language where it specifies the section references. The ER Program also reports 3-4 values in each of the boxes in the chart in Section 8. Only a single value is allowed and required for each of these boxes.</p>
<b>Round 3 NCR /CL/OFI</b>	<p>MCAR: Please provide a description (e.g. analysis document or workbook) of the adjustment procedure.</p> <p>MCAR: Please ensure that all values are accurate and follow the template.</p> <p>MCAR: Please ensure that the MR Template as written by the FCPF Carbon Fund is followed and the NCC ER Program does not change the template.</p>

<p><b>Round 3 Response from Client</b></p>	<p>"The forest cover maps in 2005, 2010, 2015 and 2019 were generated by object-based segmentation and classification. The total area of these maps are 5,118,607 ha, 5,118,612 ha, 5,118,646 ha, and 5,118,646 ha, respectively. The total area of the forest cover change maps periods 2005-2010, 2010-2015 and 2015-2019 (generated by overlaying the forest cover maps) are 5,118,788 ha, 5,118,788 ha, and 5,118,646 ha, respectively. There are small disparities in total area among the forest cover maps and the forest cover change maps. In addition, in the Emission Reductions Program Document (ER-PD) Submission on January 5, 2018, the total area of the NCC region was reported as 5,144,520 ha. This area is approximately 25.000 ha larger than the total areas of the forest cover maps and forest cover change maps.</p> <p>To be consistent with the reported area of the NCC region, the value of 5,144,520 ha was used as the reference area to compute ratio for adjustment using the following equation:</p> $\text{Ratio} = (\text{Reference area})/(\text{Total map area})$ <p>All map-based area were then adjusted by using the following equation:</p> $\text{Adjusted area} = (\text{Map-based area}) * \text{Ratio}$ <p>An description of the above-mentioned adjustment procedures has been added to the ER-MR1 (Section 3.1, page #15).</p> <p>We corrected and all values now are consistent between worksheet and MMR1</p> <p>Yes, we corrected by using the provided MMR1 template (Section 8, page #43)</p>
<p><b>Aster Global Findings - Round 4</b></p>	<p>The VVB reviewed forest cover maps for 2005, 2010, 2015, and 2019 and confirmed that respective areas are 5,118,607 ha, 5,118,612 ha, 5,118,646 ha, and 5,118,646 ha. However, the VVB noted the change area values (Area_ha) for 2015-2019 period in the workbook are different than values (Dtich) obtained from "NCC_MMR1_AD_2015_2019.shp".</p> <p>The VVB conducted an independent change analysis for 2005-2010 and 2010-2015 period while following the area adjustment procedures described in the response based on shapefiles (NCC_REL_FCM_2005.shp, NCC_REL_FCM_2010.shp and NCC_REL_FCM_2015.shp) provided. But the values obtained by the VVB do not match with the change area values used for accuracy assessment in the workbook.</p> <p>Additionally, the audit team noted a discrepancy in table numbers in Annex 1. Table A1.2 is incorrectly written A1.8. As this does not result in a material error, the VVB is issuing an Observation.</p>
<p><b>Round 4 NCR /CL/OFI</b></p>	<p>MCAR: Please make sure the values used in the workbook match with values obtained from shapefiles provided and make necessary corrections in PD and MR as applicable.</p> <p>Additionally, please provide the change shapefiles and workbook detailing the change area for the periods of 2005-2010 and 2010-2015, similar to the one provided for 2015-2019 (NCC_MMR1_AD_2015_2019.shp) in the accuracy assessment workbook.</p> <p>*The audit team is available to arrange a discussion call to provide further clarification on the finding issued.</p> <p>OBS: Please ensure all references within the MR are correct and appropriate.</p>

<b>Round 4 Response from Client</b>	<p>Revisions:</p> <p>1) The values in the “accuracy-assessment.xlsx” workbook, “vietnam-mm1_mc-analysis.xlsx” workbook and MMR1 have been corrected to match with the values obtained from the individual forest cover map shapefiles provided on the VNFF website (i.e., using AD3).</p> <p>2) The “accuracy-assessment.xlsx” workbook has been revised to provide clearer AD calculation process and now renamed as “accuracy-assessment_v2.xlsx”.</p> <p>3) The “vietnam-mm1_mc-analysis.xlsx” workbook has been revised to match with the new AD and now renamed as “vietnam-mm1_mc-analysis_v2.xlsx”.</p> <p>OBS:</p> <p>Table A1.2 (incorrectly written as A1.8) in Annex 1 has been corrected. All references within the MMR1 have been checked to ensure they are correct and appropriate.</p>
<b>Aster Global Findings - Final</b>	<p>The VVB reviewed the revised workbook “accuracy-assessment_v2.xlsx” and confirmed that values have been updated to match with the values obtained from the individual forest cover map shapefiles provided on the VNFF website. The VVB reviewed “vietnam-mm1_mc-analysis_v2.xlsx” workbook and confirmed that ER quantification has been appropriately updated based on revised activity data. This item is closed.</p> <p>The VVB confirmed that Table A1.2 (incorrectly written as A1.8) in Annex 1 has been corrected.</p>

<b>Finding Number</b>	5
<b>Carbon Methodological Framework Version 3, April 2020</b>	<b>Indicator 17.3:</b> By the time of verification, the ER Program has implemented its strategy to mitigate and/or minimize potential Displacement.
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0
<b>Aster Global Findings - Round 1</b>	No mention of the strategy to mitigate/minimize potential displacement is described in the MR. It is unclear to the audit team what the implementation status of this strategy is.

<b>Round 1 NCR/CL/OFI</b>	<p>MCAR: Please add sufficient detail to the MR to allow the audit team to understand the implementation status of the strategy to mitigate/minimize potential displacement.</p> <p>MCAR: Please provide verifiable evidence to support the statements added to the MR regarding the implementation status of the strategy to mitigate/minimize potential displacement.</p>
<b>Round 1 Response from Client</b>	We had provided text describing our strategy to mitigate potential displacement in Section 1.1, page 2 of MMR1
<b>Aster Global Findings - Round 2</b>	<p>The audit team reviewed the updated MR. Section 1.1 of the MR states that there are three components of the ER Program's strategy to mitigate displacement which are 1. Strengthen collaboration between local provinces and line departments in Vietnam and Lao monitor and protect the forests and illegal timber logging and trading; 2. Strengthen law enforcement; 3. Support agricultural crops improvement and livelihood for forest dependents to control encroachment into forest areas. However, no evidence nor narrative was provided to describe the specifics of each of these components that has been implemented.</p>
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please provide additional details within the MR to describe specific actions that have been implemented in-line with the strategy to minimize displacement. Additionally, please provide verifiable evidence to support this additional detail.
<b>Round 2 Response from Client</b>	<p>The revised text (below) was moved from Section 7 to Section 1.1 (description of activities to date in the ER program). Section 7 is 'Not Applicable' for this first ER monitoring report because there cannot be any reversals yet.</p> <p>The key actions are: (1) Propagate to local people and communities on forest protection and development; (2) Set up collaborate mechanism between line forces, including forest rangers, border guard forces, policy, customs, local authorities and forest owners in protecting the forests and controlling illegal logging and forest conversion; (3) Working closely with bordering provinces to jointly implement forest protection activities in the bordering areas; (4) Organize annual meeting for review and improvement of forest management and protection; (5) Review land use conversion plan, focusing on hydro power plant construction for replanning and monitoring; and (6) Sign and implement MoUs between the line agencies in Vietnam and Lao (Bolikhamsay and Khammoune provinces) to joint forest protection activities, control illegal wood trading and other illegal issues. All details and results of these activities are reported by all 6 provinces in NCC and these reports are available in Vietnamese. As the results of emission monitoring reported in technical REDD+ report attached to BUR3 of Vietnam (submitted on 16 April 2021, available at UNFCCC website), reveals reduced emissions and enhanced removal eco-regions in Vietnam over the period 2014-2018.</p>
<b>Aster Global Findings - Round 3</b>	Thank you for the additional elaboration on policy with regard to 6 key actions outlined in Directive 13/CT-TW , Resolution 71/NQ-CP, Directive 13/CT-TW to mitigate both reversals and displacements. However, the audit team is requesting verifiable evidence to demonstrate that mechanisms to mitigate displacements that have been described in the MMR correctly. The response mentioned reports are available in Vietnamese, as well as a report issued to the UNFCCC but those are not hyperlinked.

<b>Round 3 NCR /CL/OFI</b>	MCAR: Please provide verifiable evidence to support the the description of the ER Program's implementation of the strategy to mitigate/minimize potential Displacement.
<b>Round 3 Response from Client</b>	<p>"The revised text regarding the strategy to mitinize potential displacement was provied in section 1.1 (page #2) and verifiable evidence was presented in Table 3 (page #4).</p> <p>Section 1.1 has been edited to justify better the actions that have been implemented to minimize displacement"".We will send the reports on Directive 13 implementation via email and they are only available in Vietnamese"</p>
<b>Aster Global Findings - Round 4</b>	Thank you for providing the updated MR and supporting documents. The VVB reviewed the updated MMR and assocaited documents and is reasonably assured this criterion is satisfied. This finding is closed.

<b>Finding Number</b>	<b>6</b>
<b>Carbon Methodologi cal Framework Version 3, April 2020</b>	Indicator 18.2: The ER Program demonstrates how effective ER Program design and implementation will mitigate significant risks of Reversals identified in the assessment to the extent possible, and will address the sustainability of ERs, both during the Crediting Period, and beyond the Crediting Period.
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents</b>	MR
<b>Aster Global Findings - Round 1</b>	There is no discussion or analysis in the MR that satisfies Indicator 18.2.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please add additional language to the MR so that the VVB can understand if the ER Program is in compliance with Indicator 18.2.
<b>Round 1 Response from Client</b>	We had added text with information on mitigation strategy for reversal in Section 1.1, page 2 of MMR1

<b>Aster Global Findings - Round 2</b>	<p>Thank you for providing additional information in the MR related to the mitigation of potential reversals. The audit team reviewed the updated MR and confirmed that four components of the strategy to mitigate reversals are briefly described in the MR. The audit team is requesting additional information with specific actions that have been implemented as part of this strategy and additional information to that "demonstrates how effective ER Program design and implementation will mitigate significant risks of Reversals identified in the assessment to the extent possible, and will address the sustainability of ERs, both during the Crediting Period, and beyond the Crediting Period."</p> <p>Furthermore, the audit team is requesting that the ER Program provide additional supporting documents to demonstrate that these different components of this strategy have been implemented and support the actions that have been taken.</p>
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please clarify in line with the finding, provide additional information in the MR so the VVB can assess this criteria, and provide supporting documentation as needed to support statements within the MR.
<b>Round 2 Response from Client</b>	The revised text was moved from Section 7 to Section 1.1 . There were no major events (forest fires, natural disasters etc.) causing deforestation and other program interventions that lead to higher emissions and lower removals compared to emission and removals reference level. The results of emission and removals estimates reported in MR demonstrate the results. We also provided statistical data to this section.
<b>Aster Global Findings - Round 3</b>	Thank you for the additional elaboration on policy with regard to 6 key actions outlined in Directive 13/CT-TW , Resolution 71/NQ-CP, Directive 13/CT-TW to mitigate both reversals and displacements. The audit team has also reviewed text in Section 1.1 describing the strategy for reversal management. However, the audit team is requesting for verifiable evidence to demonstrate that mechanisms to mitigate reversals have occurred or are occurring. Section 1.1 mentioned reports are available in Vietnamese, as well as a report issued to the UNFCCC but those are not hyperlinked.
<b>Round 3 NCR /CL/OFI</b>	MCAR: Please provide additional details within the MR to describe specific actions that have been implemented in-line with the strategy to minimize reversals. Additionally, please provide verifiable evidence to support this additional detail.
<b>Round 3 Response from Client</b>	A reversal risk assessment has been included as part of section 7.3. Such assessment includes the specific actions that have been implemented to mitigate reversals".
<b>Aster Global Findings - Round 4</b>	The VVB reviewed the reversal risk assessment provided in Section 7.3 and is reasonably assured that the ER Program has provided sufficient information and supporting documentation to satisfy this requirement. This finding is closed.

<b>Finding Number</b>	<b>7</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	Indicator 37.1: Based on national needs and circumstances, the ER Program host country has made a decision whether to maintain its own comprehensive national REDD+ Program and Projects Data Management System, or instead to use a centralized REDD+ Programs and Projects Data Management System managed by a third party on its behalf. In either case of a country's use of a third party centralized REDD+ Programs and Projects Data Management System, or a country's own national REDD+ Programs and Projects Data Management System, the indicators below apply.

<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Section 2
<b>Aster Global Findings - Round 1</b>	Based on the description in the Monitoring Report it appears that the ER Program has decided to maintain its own comprehensive national REDD+ Program and Projects Data Management System. However, this is not clearly stated.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please clearly state in the MR the type of Program and Projects Data Management System that is used.
<b>Round 1 Response from Client</b>	All data and information related to ERP is managed by VNFOREST and they are all uploaded on the website of VNFF. We had added text for this in Section 6.2, page 37.
<b>Aster Global Findings - Round 2</b>	Thank you for the clarification, <b>this finding is closed.</b>

<b>Finding Number</b>	<b>8</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	Indicator 37.2: A national REDD+ Programs and Projects Data Management System or a third party centralized REDD+ Programs and Projects Data Management System needs to provide the attributes of ER Programs, including: <ul style="list-style-type: none"> <li>i. The entity that has Title to ERs produced;</li> <li>ii. Geographical boundaries of the ER Program or project;</li> <li>iii. Scope of REDD+ activities and Carbon Pools; and</li> <li>iv. The Reference Level used.</li> </ul>
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Section 2

<b>Aster Global Findings - Round 1</b>	The section titled "The Management of GHG related data and information" in Section 2 of the MR provides a list of the information that will be made publicly available and is therefore contained within the management system. However, the VVB was unable to find in the MR statements indicating if 1. The entity that has Title to ERs produced and 2. Scope of REDD+ activities and Carbon Pools is stored within the REDD+ Programs and Projects Data Management system.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please add clarifying language to MR to satisfy Indicator 37.2
<b>Round 1 Response from Client</b>	We checked and updated the link in Section 2.1, page 6.
<b>Aster Global Findings - Round 2</b>	The audit team reviewed the updated MR, specifically the links in Section 2.1. The audit team was unable to access the links and received an error message.  Similarly, it appears this information is included for the NCC ER Program but it is unclear if there are other ER Programs/Projects within NCC and Vietnam where this information is tracked.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please ensure that all links within the MR are functioning correctly.  MCAR: Please clarify how the information within the criterion are tracked for other ER Program/Projects and where this information will be stored.
<b>Round 2 Response from Client</b>	As explained above, all links work well and data are available on VNFF website. <b>We have prepared the doc file named "15.12.22_ Weblinks to ERP data" which provides all weblinks to VNFF homepage in English and specific information.</b>  All information on FCPF ER program in North Central Coast Region is managed by VNFOREST and the relevant information (FREL/REL, MMR, project documents, other admin papers etc.) is stored at VNFF website. A specific Decree on ER program (focusing on ER title, benefits sharing etc.) is ready for GoV's official approval)
<b>Aster Global Findings - Round 3</b>	The audit team found broken links within Vietnam MMR1_Final 20.12.2022.docx, including: <a href="http://sis.vietnam-redd.org/">http://sis.vietnam-redd.org/</a> ; <a href="http://vnff.vn/erpa-program">http://vnff.vn/erpa-program</a> ; <a href="https://www.usaid.gov/vietnam/documents/vietnam-forests-and-deltas-program">https://www.usaid.gov/vietnam/documents/vietnam-forests-and-deltas-program</a> ; <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis">http://vnff.vn/erpa-program/mmr1-2018-2029/mc-analysis</a> ; <a href="https://snv.org/cms/sites/default/files/explore/download/vfd_sl_success_story_climate_smart_livelihoods.pdf">https://snv.org/cms/sites/default/files/explore/download/vfd_sl_success_story_climate_smart_livelihoods.pdf</a> .  It is unclear if there are other ER Programs/Projects within NCC other than the FCPF.
<b>Round 3 NCR /CL/OFI</b>	MCAR: Please ensure that all links within the MR are functioning correctly.  MCAR: Please clarify how the information within the criterion are tracked for other ER Program/Projects and where this information will be stored.
<b>Round 3 Response from Client</b>	"We have corrected and all links have been corrected and they are fully operational  The government is currently working on the framework to register and approve such initiatives if they were to happen in the near future. The current version of the DMS only includes existing initiatives (eg, the FCPF Program)."

<b>Aster Global Findings - Round 4</b>	The VVB further confirmed that EF data from 2005 to 2019 including EF reports, and QA/QC data and reports are publicly available via the link included in the MR. This finding is closed.
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<b>Finding Number</b>	<b>9</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	Indicator 37.3: The information contained in a national or centralized REDD+ Programs and Projects Data Management System is available to the public via the internet in the national official language of the host country (other means may be considered as required).
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Section 2
<b>Aster Global Findings - Round 1</b>	<p>The audit team reviewed the MR which states "All the GHG related data and information are managed by VNFOREST using an information system. This information system has a GIS database that store all the maps and data collected by the MMR as well as information about the methods, and a web-based information portal to provide information to stakeholders, users and reviewers. Detailed information on key data and methods to enable the reconstruction of the Reference Level, and the reported emissions/removals are documented and made publicly available online via this web-based portal." It is unclear what the link to this web portal is.</p> <p>The MR mentions <a href="http://vnff.vn">http://vnff.vn</a>, which the VVB inspected. It doesn't appear any of the spatial information, AD data, and other links on the website have any information attached to them.</p>
<b>Round 1 NCR/CL/OFI</b>	<p>MCAR: Please provide the web based portal referenced in the finding.</p> <p>MCAR: Please ensure that all links on the <a href="http://vnff.vn/">http://vnff.vn/</a> website are functioning in line with this Indicator.</p>
<b>Round 1 Response from Client</b>	<p>As explained above, we checked the web link and made correction at Section 2.1, page 6. The weblink to VNFF containing the data and information on ERP is here: QUỸ BẢO VỆ VÀ PHÁT TRIỂN RỪNG VIỆT NAM (vnff.vn), direct link to several folders are as follows:</p> <ul style="list-style-type: none"> <li>o AD: <a href="http://www.vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-data">www.vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-data</a></li> <li>o Maps: <a href="http://www.vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019">www.vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/ad-map-2015-2019</a></li> <li>o EF: <a href="http://www.vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-/ef-data-2019">www.vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-/ef-data-2019</a></li> </ul>

<b>Aster Global Findings - Round 2</b>	Pending response to the finding related to Indicator 37.2.
<b>Round 2 NCR/CL/OFI</b>	
<b>Round 2 Response from Client</b>	The REDD+related information (activities, projects) up to 2021 is now available on VNFF website. You can find that when you access to the VNFF homepage at: <a href="http://vnff.vn/?hl=en">http://vnff.vn/?hl=en</a>
<b>Aster Global Findings - Round 3</b>	The audit team notes that Section 2.1 of the MR has been revised to include the hyperlink to the web-based portal, <a href="http://vnff.vn/?hl=en">http://vnff.vn/?hl=en</a> which includes relevant data. <b>This finding is now closed.</b>

<b>Finding Number</b>	<b>10</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	Indicator 37.4: Administrative procedures are defined for the operations of a national or centralized REDD+ Programs and Projects Data Management System; and an audit of the operations is carried out by an independent third party periodically, as agreed with the Carbon Fund.
<b>Requirement Met (Y, N, or Pending)</b>	N
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR
<b>Aster Global Findings - Round 1</b>	The ER Program is required to demonstrate that "Administrative procedures are defined for the operations of a national or centralized REDD+ Programs and Projects Data Management System; and an audit of the operations is carried out by an independent third party periodically, as agreed with the Carbon Fund." The VVB has not been provided with any evidence to satisfy this criteria.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please provide evidence to satisfy the requirements in Indicator 37.4.
<b>Round 1 Response from Client</b>	Administrative procedures for the operations of a national or centralized REDD+ Programs and Projects Data Management System are mentioned in the Decision No. 419/QĐ-TTg dated 5 April 2017 of the Prime Minister on Approval of the National Action Programme on the Reduction of Greenhouse Gas Emissions through the reduction of Deforestation and Forest Degradation, Sustainable Management of Forest Resources, and Conservation and Enhancement of Forest Carbon Stocks (REDD+) by 2030. There was a Steering Committee taking a lead in coordinating the implementation of REDD+ programs and initiatives in Vietnam. VNFOREST is an agency to directly assist the Steering Committee in coordinating and implementing the REDD+ related activities.

<b>Aster Global Findings - Round 2</b>	Thank you for the clarification. However, the audit team was not provided copies of the Administrative Procedures.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please provide the administrative procedures related to the nation REDD+ Programs and Projects Data Management System.
<b>Round 2 Response from Client</b>	<p>In 2016, VNFOREST issued a legal document on administration of REDD+ portal (document is available in Vietnamese). It clearly indicates that VNFOREST is a focal point for running and managing REDD+ portal linking to Forest Management Information System (FORMIS). This focuses on REDD+.</p> <p>Currently, Vietnam is developing a domestic carbon market (including database) and a national MRV for monitoring the implementation of Vietnam's NDC and carbon trading as regulated by Environment Protection Law 2020 and Decree 06 (2022). A sectoral MRV is under development for emissions mitigation monitoring.</p>
<b>Aster Global Findings - Round 3</b>	<p>Thank you for providing additional clarifying information with regards to the roles of VNFOREST. However, we are requesting defined administrative procedures to be provided to the audit team.</p> <p>Additionally, please provide the link to the document referenced in the ER Program's Round 2 Response.</p> <p>In addition, evidence of an audit of the operations is required for indicator 37.4. However, this is not being issued as a finding as the VVB has reached out to FCPF Secretariat for further clarification.</p>
<b>Round 3 NCR /CL/OFI</b>	<p>MCAR: Please provide the administrative procedures related to the nation REDD+ Programs and Projects Data Management System.</p> <p>MCAR: Please provide a link to the "legal document on administration of REDD+ portal" and a copy of the document referenced in the ER Program's Round 2 Responses.</p>
<b>Round 3 Response from Client</b>	<p>"Currently there are no administrative procedures in place for the Data Management System. However, those procedures will be in place during the subsequent reporting period, The FMT has instructed the VVB to issue an mCAR covering this finding. Consequently, this finding will be addressed during the subsequent verification.</p> <p>It is a Decision 419 on national REDD+ program toward 2030. REDD+ portal is a part of REDD+ M&amp;E. The link to this is:  <a href="https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Quyet-dinh-419-QD-TTg-Chuong-trinh-quoc-gia-giam-phat-thai-khi-nha-kinh-qua-han-che-mat-rung-2017-345551.aspx">https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Quyet-dinh-419-QD-TTg-Chuong-trinh-quoc-gia-giam-phat-thai-khi-nha-kinh-qua-han-che-mat-rung-2017-345551.aspx</a> "</p>
<b>Aster Global Findings - Round 4</b>	Thank you for the clarification that there are no administrative procedures in place. Based on specific guidance provided from FMT, the VVB is issuing a mCAR to require that the ER Program prepare and have in place for the subsequent reporting period the administrative procedures of the DMS and to demonstrate the operability of the DMS in order to comply with criterion 37 of the FCPF Methodological Framework.

<b>Round 4 NCR /CL/OFI</b>	mCAR: As the ER Program does not have administrative procedures in place, the ER Program should prepare and have in place for the subsequent reporting period the administrative procedures of the DMS and to demonstrate the operability of the DMS in order to comply with criterion 37 of the FCPF Methodological Framework.
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<b>Finding Number</b>	<b>11</b>
<b>Carbon Methodological Framework Version 3, April 2020</b>	General calculation Review
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	EF_2010_2019.xlsx / 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx
<b>Aster Global Findings - Round 1</b>	<p>1. As discussed in the meeting on OCT 26, 2021, it would be appreciated if the reference for variance <math>t2\\$Var &lt;- (t2\\$n\_psu * t2\\$dif\_sq) / ((t2\\$n\_psu - 1) * (t2\\$area^2))</math> in the R coding "BiomassCalc_erp_cycle5_v3.R" could be provided. Is <math>t2\\$Var &lt;- (t2\\$n\_psu * t2\\$dif\_sq) / ((t2\\$n\_psu - 1) * (t2\\$area^2))</math> an equation for variance of the weighted mean and <math>t2\\$SE &lt;- sqrt(t2\\$Var)</math> an estimate for the standard error of the weighted mean?</p> <p>2. What is the exact number of clusters? The number of clusters in Table 2. in "Result, EF_2010_2019.xlsx" doesn't match the numbers in "Table 3: The number of clusters and plots by provinces in the NCC region, Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx".</p> <p>3. Although discussed in the meeting on OCT 26, 2021, for additional clarifications: where does the hectare in Table 3. from "Result, EF_2010_2019.xlsx" come from? Where exactly do Cells B23&amp;C23 feed into in the simulation spreadsheet "01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx"?</p> <p>4. What is the formula for calculating uncertainties in the Table "Page 17, Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx" in relation to "Std. Error (Column F)" in "MC_Input-RL, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx"? Have correct equations been applied for the uncertainty calculation? Please double-check.</p> <p>5. In "MC_Input -Result, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx", from which file the numbers for activity data - Mean, Std. Error - come?</p> <p>6. In "AD_EF, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx", where do the numbers for Cells E6:10 come from?</p> <p>7. Where does the table in "Available ER, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx" feed into in "Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx"?</p>

<p><b>Round 1 NCR/CL/OFI</b></p>	<p>MCAR: Please address in line with findings.</p>
<p><b>Round 1 Response from Client</b></p>	<ul style="list-style-type: none"> <li>•A supporting document (see “Report on calculation of above-ground biomass densities for forest types in the North Central Coast region” (available at item “Emission Factor 2010-201_v5_s5_Eng 11.4.22” on <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-">http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-</a>) has been supplemented to explain the formula of the variance “<math>t2\\$Var &lt;- (t2\\$n\_psu * t2\\$dif\_sq)/((t2\\$n\_psu - 1) * (t2\\$area^2))</math>” in the R coding. Equation (12) in this report (page 9) shows the formula for calculating the SE and by applying <math>Var = SE^2</math>, we will have the formula for the variance.</li> <li>•Yes, “<math>t2\\$Var &lt;- (t2\\$n\_psu * t2\\$dif\_sq)/((t2\\$n\_psu - 1) * (t2\\$area^2))</math>” is an equation for variance of the weighted mean and “<math>t2\\$SE &lt;- sqrt(t2\\$Var)</math>” is an estimate for the standard error of the weighted mean.</li> <li>•The exact number of clusters in the NCC is 453 as indicated in "Table 3: The number of clusters and plots by provinces in the NCC region, Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx". The reason that the number of clusters in Table 2. in "Result, EF_2010_2019.xlsx" doesn't match the numbers in "Table 3: The number of clusters and plots by provinces in the NCC region, Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx" is because one cluster may have different plots located in different forest types so it will be counted more than one time. For example, if five plots in one cluster are located in five different forest types, this cluster will be counted five times in Table 2 in "Result, EF_2010_2019.xlsx".</li> <li>•The hectares of bamboo and mangrove forests in Table 3 from "Result, EF_2010_2019.xlsx" come from the data of Forest Protection Department. However, these data are not officially published. Therefore, we have changed these hectares to the values derived from forest cover maps (See detailed explanation on the “Report on calculation of above-ground biomass densities for forest types in the North Central Coast region” available at <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-">http://vnff.vn/erpa-program/mmr1-2018-2029/emission-factor-ef-</a> ). In this report, we also re-calculated the AGB densities of the “other forest” category in 2005 using updated hectares of bamboo and mangrove forests derived from the 2005 forest cover map. This results in a slightly different AGB densities/carbon densities for the “other forest” category as compared to previous reported values.</li> <li>•The carbon densities of "other forests" in cell B23&amp;C23 were used to calculate the AGB of "other forests" in the spreadsheet “01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx”. Now, we have directly used AGB densities instead of C stock densities as inputs for the above-mentioned spreadsheet.             <ul style="list-style-type: none"> <li>•The formula for calculating “Std. Error (Column F)” in "MC_Input-RL, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx" in relation to the uncertainties in the Table "Page 17, Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx" is <math>SE = Mean * Uncertainties</math>. This is a wrong formula; we have revised this formula as <math>SE = (Mean * Uncertainties)/1.64</math>, where 1.64 is the z-score of normal distribution at 90% CI. Moreover, this formula is applied throughout the spreadsheet to calculate the SE of other parameters. See the updated spreadsheet for the detailed calculations.</li> </ul> </li> <li>•The Mean, Std and Error come from Sample based analysis to calculate the AD and their uncertainties at the 90% CI as reported in the “NCC_AD_accuracy_final.xlsx” workbook and following the SOP of sample-based accuracy assessment. Both the “NCC_AD_accuracy_final.xlsx” workbook and the SOP of sample based accuracy assessment are available on the VNFF website: <a href="http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/accuracy-">http://vnff.vn/erpa-program/mmr1-2018-2029/activities-data-ad-/accuracy-</a></li> </ul>

assessment-data. •The numbers for Cells E6:10 in "AD\_EF, 01\_Vietnam\_M.C Analysis Phuong 22 April 2021 - Final\_Auto sensitivity analysis.xlsx" are carbon densities in the unit of tCO<sub>2</sub>/ha and are calculated from the biomass densities in Cells E12:E16 using the formula: C\_density (Cells E6:E10) = Biomass (Cells E12:E16) \* 0.47 (Cell E1) \* 3.667 (Cell E2).

•The table in "Available ER, 01\_Vietnam\_M.C Analysis Phuong 22 April 2021 - Final\_Auto sensitivity analysis.xlsx" feed into the table in Section 8 – "Emission Reductions available for transfer to the Carbon Fund" (page 39) of the "Vietnam\_1st ER Monitoring Report\_18May,2021\_final\_without Annex 1-3.docx".

<b>Aster Global Findings - Round 2</b>	<p>1. The audit team confirms the receipt of the document for variance "Methods for calculation of mean value and variance.docx" and checked that the R coding was in line with the formula presented in the document. <b><u>This item is closed.</u></b></p> <p>2. The audit team re-checked the number of clusters in "Tree, EF_2010_2019.xlsx" but found that "cluster_id (Column B)" has 436 unique IDs (not 453). Please clarify where the discrepancy in the numbers comes from. Is this because no data was collected for the plots (453-436=17 plots)?</p> <p>3. The audit team confirmed the receipt of the sources for area and AGB: emission-factor-2010-201_v5_s5_eng-11-4-22.pdf/Emission Factor 2010-2019 Eng V5_s1.docx and checked that AGBs were correctly applied to M.C. simulation. <b><u>This item is closed.</u></b></p> <p>4. The audit team confirmed in "01_Updated Vietnam_M.C Analysis Phuong 22 April 2021...xlsx" that the correct standard error calculation was applied for every parameter for M.C. simulation. <b><u>This item is closed.</u></b></p> <p>5. The audit team confirmed the source of Mean/Std. Error: NCC_AD_accuracy_final_Hung_v3_11.04.22.xlsx and checked that the numbers were correctly sourced. <b><u>This item is closed.</u></b></p> <p>6. The audit team confirmed the formula 'C_density (Cells E6:E10) = Biomass (Cells E12:E16) * 0.47 (Cell E1) * 3.667 (Cell E2)' was correctly applied for Cells E6:10. <b><u>This item is closed.</u></b></p> <p>7. The audit team confirmed that "Available ER" tab has been correctly reflected with the correct calculations. This tab is also correctly pasted into the front page of "er-monitoring-report-er-mr-updated-12-4-22.pdf". <b><u>This item is closed.</u></b></p>
<b>Round 2 NCR/CL/OFI</b>	<p>MCAR: For #2 findings, please clarify the discrepancy in the number of clusters.</p>
<b>Round 2 Response from Client</b>	<p>MCAR 11.2.1: The correct number of clusters is 453 as reported in the MR. However, you are correct that there are 436 clusters having only tree data. Of the 17 clusters that do not have tree data, two clusters have bamboo data. Therefore, the remaining 15 clusters neither have tree data nor bamboo data and all plots in these clusters are assigned non-forest land use type. The IDs of those 15 clusters are: 1141, 1198, 1218, 1323, 1378, 1392, 1475, 1505, 1548, 1575, 1598, 1615, 1623, 1625, 1667. A footnote has been added on page 21 of the MMR1 to clarify this discrepancy.</p>
<b>Aster Global Findings - Round 3</b>	<p>MCAR 11.2.1: The audit team confirmed the response provided here to be accurate and is reasonably assured that this addresses the finding. <b><u>This finding is closed.</u></b></p>

<b>Finding Number</b>	12
<b>Forest Carbon Partnership Facility (FCPF) Carbon Fund ER</b>	Number of net ERs generated by the ER Program during the Reporting Period covered in this report:

<b>Monitoring Report (ER-MR)</b>	
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf
<b>Aster Global Findings - Round 1</b>	Where does the calculation for the front page of "Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx", so "Number of FCPF ERs: 13,811,121 tCO <sub>2</sub> -e, etc..." come from? The matching numbers cannot be found in "01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx".
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please address in line with findings
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>•We follow the template provided by FCPF for calculation of ER. In the excel file you mentioned, you can find this at sheet name "Available ERs". We checked the numbers and made correction since the update of EF.</li> <li>•The "Number of FCPF ERs:" on front page of field "Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx" is now updated to be 15,921,089 tCO<sub>2</sub>e. This number comes from the last row (row L) in the table in "Available ER, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx". Other calculated values on the front page of the MR also come from the table in "Available ER, 01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx".</li> </ul>
<b>Aster Global Findings - Round 2</b>	The audit team confirmed the calculation of "Available ER, 01_Updated Vietnam_M.C Analysis Phuong 22 April 2021...xlsx" and the numbers were correctly reflected in the front page of "er-monitoring-report-er-mr-updated-12-4-22.pdf". <b><u>This item is closed.</u></b>

<b>Finding Number</b>	13
<b>FCPF Glossary of Terms V2.1 - August 2021 - Definition/Criteria</b>	<p><b>Crediting Period Start Date: Is the date that complies with the following conditions:</b></p> <ol style="list-style-type: none"> <li>1. It is not earlier than the date the first ER Program Measure(s) (including any Sub-Project(s)) begins generating ERs, i.e. first implementation<sup>2</sup> .</li> <li>2. It is justified with objective evidence by the ER Program Entity and it is independently assessed by a Validation Verification Body during Validation.</li> <li>3. It is not earlier than January 1<sup>st</sup> 2016<sup>3</sup> .</li> <li>4. It does not fall within the Reference period.</li> <li>5. It is demonstrated that the ER Program complies with requirements since the start date on safeguards<sup>4</sup> , carbon accounting and double-counting as specified in the MF.</li> </ol>

<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf
<b>Aster Global Findings - Round 1</b>	The audit team reviewed the MR and noted that there is no discussion as to what the crediting period start date is or why it is appropriate in line with the requirements in the FCPF program.
<b>Round 1 NCR/CL/OFI</b>	<p>MCAR: Please add additional information to the MR so the audit team can assess whether the crediting period start date satisfies the requirements of the FCPF Program.</p> <p>MCAR: Please provide verifiable evidence to support the new statements in the MR that discuss why the crediting period start date is appropriate.</p>
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>•This is decided when we prepare ERPD, including start and end dates for reference level and for crediting period. We corrected this and mentioned this in the first page of MMR1.</li> </ul>
<b>Aster Global Findings - Round 2</b>	<p>The audit team reviewed the er-monitoring-report-er-mr-updated-12-4-22.pdf and found no description of how the start date of the crediting period is complies with the requirements set out in the FCPF Glossary of Terms</p> <p>Furthermore, the FCPF Carbon Fund has published an updated Monitoring Report Template which the ER Program has not used.</p>
<b>Round 2 NCR/CL/OFI</b>	<p>MCAR: Please add additional information to the MR so the audit team can assess whether the crediting period start date satisfies the requirements of the FCPF Program.</p> <p>MCAR: Please provide verifiable evidence to support the new statements in the MR that discuss why the crediting period start date is appropriate.</p> <p>MCAR: Please ensure that the ER Program is using the most recently published MR Template and if necessary provide an updated MR that uses the most recent MR Template.</p>
<b>Round 2 Response from Client</b>	We provided this information in section 4.3, page 27. The start date we use was 1 January 2018. The document "FMT Note 2020-3" dated Novemver 4, 2020 provides guiding on "Crediting Period start Date under FCPF Program" with 2 options: (1) option 1 - start date back to date of presentation of final ERPD; (2) option 2 - Start date back to start date of ER program. We think option 2 is suitable for Vietnam; and even option 1, we may need to deduct ER amount for 1 month. We would like to seek for your advise

<b>Aster Global Findings - Round 3</b>	<p>Thank you for providing the revised narrative which states that the selected crediting period start date is in compliance with the 5 criteria in FCPF "Glossary of Terms". However, it is not clear how the demonstrations in this document were satisfied. Specifically:</p> <ul style="list-style-type: none"> <li>- Item 1. "It is not earlier than the date the first ER Program Measure(s) (including any Sub- Project(s)) begins generating ERs, i.e. first implementation2. ". footnote 2 the date of measures described in the Final ERPD could not be located.</li> <li>- Item 2. The MMR states "The start date is justified by Government of Vietnam policy and practice in terms of forest inventory implementation." However no subsequent discussion of the Vietnam Policy, implemented activities, or forest inventory implementation could be located to provide the VVB verifiable evidence, as required by FMT Note 2020-3.</li> </ul> <p>Item 3. The MMR states "The ER program is in compliance with all requirements since the start date including Safeguards (see Annex I of this report), carbon accounting practices (section 4 of this report), and double counting (section 6 of this report)." However, no clear start dates have been described in the MMR and the VVB has not received specific supporting evidence to support the start dates of these various actions.</p> <p>Additionally, the discussion of crediting period in the MMR is listed both in Annex 4 and also in an incorrect location as required by the template.</p> <p>Thirdly, the first mention of the credit period is stated as "1 January 2018-31 December 2019 " which is the duration of this ER-MR. However, the Glossary defines crediting period as "The period between the Crediting Period Start Date and the end date of the last Reporting Period under the ER Program which consists of at least two (2) Reporting Periods. ". It is unclear if the defined crediting period meets the glossary's definition.</p> <p>Similarly, the ER Program MR reports the first reporting period as 01 January 2016 - 31 December 2019, which is after the reported start date of the crediting period, 01 January 2018.</p>
<b>Round 3 NCR /CL/OFI</b>	<p>MCAR: Please provide sufficient description to allow the audit team to assess whether the crediting period start date satisfies the requirements of the FCPF program and provide verifiable evidence to support these assertions.</p> <p>MCAR: Please place the crediting period start date in the correct position, per the template.</p> <p>MCAR: Please provide clarity as to the duration of the period to be defined as the crediting periods.</p> <p>MCAR: Please clarify using specific normative FCPF CF documents that is allowable to have a crediting period start date that is after the start of the 1st reporting period or update the crediting period as allowed.</p>
<b>Round 3 Response from Client</b>	<p>The justification of the start of the crediting period has been improved as part of Annex 4 to ensure compliance with the requirements listed in the FCPF Glossary of Terms.</p> <p>Also please refer to FMT's letter</p>
<b>Aster Global Findings - Round 4</b>	<p>Thank you for the updated MMR. The VVB reviewed the guidance provided by the FMT and the updated MMR and confirmed that the start has been justified and the VVB is reasonably assured the start date is in compliance with the FCPF Carbon Fund requirements.</p>

<b>Finding Number</b>	<b>14</b>
<b>Guideline on the application of the Methodological Framework Number 1 On the use of interpolation of data in relation to the Reference Period of an ER program</b>	a. The effect of such an interpolation on the Reference Level shall be clearly documented;
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Annex 4
<b>Aster Global Findings - Round 1</b>	The audit team reviewed Annex 4 of the MR and although there is mention of the interpolation of carbon stocks, the effect of the interpolation on the Reference Level is not clearly documented.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please update the MR to include clear documentation on the effect of the interpolation on the Reference Level.
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>•The effect of the interpolation of 2015 AGB densities is discussed in Section 8.3 of Annex 4 (page 94) as follows: "The updated annual reference level for ERP for 2018-2025 is 12.8 million tCO<sub>2</sub>-e of emissions and -6.6 million tCO<sub>2</sub>-e of removals. Comparing to the reference level presented in ERPD, the updated annual emission and removal reference levels are higher than that of ERPD. Annual emission reference level is 1.9 million tCO<sub>2</sub>-e (or 17%) higher (in ERPD it was 10.9 million tCO<sub>2</sub>-e) and it is -0.3 million tCO<sub>2</sub>-e (or -5%) higher in the updated removal reference (-6.3 million tCO<sub>2</sub>-e for removal reference in ERPD)."</li> </ul>
<b>Aster Global Findings - Round 2</b>	<p>The audit team noted that calculation of Emission Factors and Activity Data worksheets for Cycles 3 &amp; 4 were not available to confirm the response. Please provide the relevant calculation of Emission Factors and Activity Data worksheets for Cycles 3 &amp; 4.</p> <p>Similarly, no quantification files have been provided that show these different cycles are aggregated/interpolated to generate the emission factors used in the Reference Level.</p>

<b>Round 2 NCR/CL/OFI</b>	<p>MCAR: Please provide calculation files of Emission Factors and Activity Data worksheets for Cycles 3 &amp; 4.</p> <p>MCAR: Please provide all necessary quantification and supporting files demonstrating how the emission factors for the reference level are quantified and applied.</p>
<b>Round 2 Response from Client</b>	<p>MCAR 14.2.1: The plot data for cycles 3, 4 and 5 as well as the R code for processing them to calculate the EFs that are used in the quantification of the RL are available at: <a href="http://vnff.vn/erpa-program/data/emission-factors?hl=en">http://vnff.vn/erpa-program/data/emission-factors?hl=en</a>. This link provide 3 files: EF data 2005-2019; EF report and QA/QC data and report. The worksheet for re-calculating FREL/FRL is provided in the tab “RL_2005-2015” of the excel file “01_updated-vietnam_m-c-analysis-phuong-22-april-2021-final_auto-sensitivity-analysis_28-03-2022-hung_10-04-2022_v2_phuong-01-06-22.xlsx” that is available at the weblink: <a href="http://vnff.vn/erpa-program/mmrs/mc-analysis?hl=en">http://vnff.vn/erpa-program/mmrs/mc-analysis?hl=en</a></p> <p>MCAR 14.2.2: The plot data for cycles 3, 4 and 5 as well as the R code for processing them to calculate the EFs that are used in the quantification of the RL are available <a href="http://vnff.vn/erpa-program/data/emission-factors?hl=en">http://vnff.vn/erpa-program/data/emission-factors?hl=en</a>. The report on calculation of AGB densities is also provided in that link. The worksheet for applying the emission factors to re-establish the FREL/FRL is provided in the tab “RL_2005-2015” of the excel file “01_updated-vietnam_m-c-analysis-phuong-22-april-2021-final_auto-sensitivity-analysis_28-03-2022-hung_10-04-2022_v2_phuong-01-06-22.xlsx” that is available at <a href="http://vnff.vn/erpa-program/mmrs/mc-analysis?hl=en">http://vnff.vn/erpa-program/mmrs/mc-analysis?hl=en</a></p>
<b>Aster Global Findings - Round 3</b>	<p>Thank you for providing the calculation of emissions factors for cycles 3, 4 and 5, as well as the linear interpolation for 2015. The audit team was able to reconstruct the interpolation of 2015's AGB densities located in "Result NCC sum.xlsx", by executing the associated R script.</p> <p>However, it is unclear how the uncertainties in 2015 C stock, as calculated in Result_NCC_Sum.xlsx, differ from the uncertainties in 2015 C stock listed in pgs 139-140 in Vietnam MMR1_final 20.12.2022.docx and in the AD_EF tab of the vietnam-mm1_mc-analysis.xlsx.</p> <p>Additionally, it is unclear in the AD_EF tab of the vietnam-mm1_mc-analysis.xlsx, why the calculation of belowground biomass density in each forest type does not consistently apply the same rule to determine the amount of belowground biomass density (this rule is set as 20% or 24% of aboveground biomass density depending on whether the aboveground biomass is less than or greater than 125 tdm/ha).</p>
<b>Round 3 NCR /CL/OFI</b>	<p>MCAR: Please clarify why the uncertainties listed in the MR and MC workbook do not match results provided by the calculation R script.</p> <p>MCAR: Please clarify how the belowground biomass density was determined.</p>

<p><b>Round 3 Response from Client</b></p>	<p>" The reason for slight differences is: the uncertainties of 2015 AGB densities in the ""Result NCC sum.xlsx"" file were calculated from the uncertainties of 2010 and 2019 AGB densities using the error-propagation method while the uncertainties in the MR and MC workbook were calculated using the Monte Carlo simulation method with 10.000 iterations. Actually, the uncertainties of 2015 AGB densities are not used as inputs to randomly generate the 2015 AGB densities but instead the 2015 AGB densities are calculated from the 2010 and 2019 AGB densities using linear interpolation (see formulae in cells W14, X14, Y14, Z14 and AA14 of the MC workbook). Therefore, it is possible to calculate the uncertainties of 2015 AGB densities from Monte Carlo method. Such uncertainties are reported in cells W12, X12, Y12, Z12, and AA12 of the MC workbook. Since the combined uncertainties are reported using Monte Carlo method, the uncertainties of 2015 AGB densities calculated by Monte Carlo method are reported in the MR. An explanation has been added to the MR (Section 3.2, page #19) to clarify for these differences.</p> <p>We used IPCC default value. When the AGB density of one forest type changes from below 125 tdm/ha in one cycle to above 125 tdm/ha in another cycle or vice versa, there will be a suddent change of ~20% in the Root-to-Shoot ratio (RS) between cycles (from 0.20 to 0.24 or vise versa) and this will cause an artifical change in the BGB density between cycles. To avoid such artifical change in the BGB densities, the AGB densities of NFIMAP Cycle 3 were used to determine the RS for each forest type. A footnote has been added to the MR (Section 2.2.2, page #11) to clarify how the RS ratio and the belowground biomass density was determined."</p>
<p><b>Aster Global Findings - Round 4</b></p>	<p>Thank you for clarifying the source of these uncertainties as well as adding clarifying text in the MR. The audit team has closed this portion of the finding.</p> <p>The audit team also understand that the root to shoot ratio is fixed, based on ABB densities of NFIMAP Cycle 3. Otherwise fluctuations in carbon stock changes may be an artefact of the root-shoot ratio. The audit team has clsoed this portion of the finding.</p>

<p><b>Finding Number</b></p>	<p>15</p>
<p><b>Guideline on the application of the Methodological Framework Number 1 On the use of interpolation of data in relation to the Reference Period of an ER program</b></p>	<p>b. It shall be also justified, using secondary data, that the interpolation period does not include any unusual and significant forest loss in terms of forest area or forest carbon emissions and therefore that such interpolation does not lead to an increase in the uncertainty of activity data or emission factors;</p>
<p><b>Requirement Met (Y, N, or Pending)</b></p>	<p>Y</p>

<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Annex 4
<b>Aster Global Findings - Round 1</b>	The audit team reviewed Annex 4 of the MR and although there is mention of the interpolation of carbon stocks there is no justification, using secondary data, that the interpolation does not lead to an increase in the uncertainty of the emission factors.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please provide verifiable evidence in line with the finding. Additionally please add additional language to the MR to satisfy this criterion.
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>The reference level in the ERPD was established using the carbon stocks in 2015 which are assumed to be equal to the carbon stocks in 2010 (because of lacking plot data for period 2011-2015) while the modified reference level in the MR was established using the carbon stocks in 2015 which were interpolated from the carbon stocks in 2010 and 2019. It is commonly believed that interpolated values will have higher accuracy (i.e., less bias) than assumed values. Therefore, the use of interpolated 2015 AGB densities complies with item 1.a in the positive list of acceptable technical corrections, which said: "Replacement of emission or removal factors by others with improved accuracy based on a new National Forest Inventory ...". Additional text has been added to the MR (page 88) to justify the use of interpolation values.</li> </ul>
<b>Aster Global Findings - Round 2</b>	The audit team reviewed the newly submitted files provided by the ER Program and updated MR. However, the audit team was unable to find verifiable evidence and a narrative within the MR regarding how this criterion is satisfied.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please provide verifiable evidence and a narrative within the MR demonstrating that this criterion is satisfied.
<b>Round 2 Response from Client</b>	<p>MCAR 15.2.1: The AGB densities for 2015 were interpolated from AGB densities of 2010 and 2019, which may lead to an increase in the uncertainty of emission factors. Therefore, the following secondary data period 2010-2019 are collected and provided to justify that the interpolation period does not include any unusual and significant forest loss in terms of forest area or forest carbon emissions and therefore that such interpolation does not lead to an increase in the uncertainty of emission factors: (1) annual forest area published by MARD; (2) the annual area of reforestation/afforestation; (3) the annual area of forest fires; and (4) the annual harvest timber volume. These data are provided in tables and charts. It can be observed that: (1) there is no unusual change in the dynamics of forest area of the NCC in the period 2010-2019; (2) there are no unusual changes in the annual area of reforestation/afforestation; (3) the area of forest fires is very small compared to the total area of forest in the NCC; and (4) the harvested timber volume grows almost linearly during the period 2010-2019. Therefore, these data imply that such interpolation does not lead to an increase in the uncertainty of emission factors. This explanation has been added on page 27 of the MMR1. WE PROVIDE REQUIRED INFORMATION IN SEPARATE DOCUMENT NAMED "15.12.22_Justification for interpolation of emission factors"</p>

<b>Aster Global Findings - Round 3</b>	The audit team notes that the technical correction (specifically, assuming a linear interpolation of AGB carbon stocks from 2010 to 2019 to estimate AGB carbon stocks in 2015) has been documented in Annex 4, along with a justification that this interpolation does not lead to an increase in the uncertainty of emissions factors. However, the audit team notes the uncertainty associated with these emission factors from the R script do not match reported uncertainties in the MR (see above finding). This issue is pending resolution of the above finding.
<b>Round 3 NCR /CL/OFI</b>	MCAR: Please clarify why the uncertainties listed in the MR do not match results provided by the calculation R script.
<b>Round 3 Response from Client</b>	As above
<b>Aster Global Findings - Round 4</b>	Thank you for clarifying the source of these uncertainties as well as adding clarifying text in the MR. The audit team has closed this finding.

<b>Finding Number</b>	<b>16</b>
<b>Guideline on the application of the Methodological Framework Number 1 On the use of interpolation of data in relation to the Reference Period of an ER program</b>	c. It shall be demonstrated that methods to estimate emissions outside the Reference Period are consistent with the methods used to estimate emissions within the Reference Period.
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR Annex 4
<b>Aster Global Findings - Round 1</b>	The audit team reviewed Annex 4 of the MR and although there is mention of the interpolation of carbon densities there is no demonstration that satisfies this requirement.

<b>Round 1 NCR/CL/OFI</b>	MCAR: Please provide a demonstration that methods to estimates emissions outside the reference period are consistent with the methods used to estimate emissions within the reference period. Additionally, please add additional language to the MR to satisfy this criterion.
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>Although the inventory plot design in NFIMAP cycle 5 is changed compared with previous NFIMAP cycles 3 and 4, which have been used for establishing the FREL/FRL, the sampling method (i.e., systematic sampling with a grid size of 8 km) is maintained. The changes are mainly in the plot design ((i.e., number of SSUs in one PSU, the shape of the SSUs, the area of the SSUs, and the distance between SSUs in one PSU). From the equation to calculate the mean value of AGB densities for these plot designs, it can be seen that these changes will not affect the mean value of the AGB densities, but only affect the standard errors of the mean values. Consequently, these changes will not cause a bias (i.e., a systematic error) of the change between the means of AGB densities in a period, but only affect the uncertainty of the change. Therefore, it can be said that the Monitoring Period uses an equivalent method of field inventory design with that used to set the Reference Level. This explanation has been added to the MR (page 19).</li> </ul>
<b>Aster Global Findings - Round 2</b>	Thank you for the additional information. It is unclear to the audit team if the plot centers were maintained throughout the changes in the design of the PSUs and SSUs.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please provide additional details within the MR regarding how PSU and SSU centers were moved or not moved throughout the changes of the sampling design.
<b>Round 2 Response from Client</b>	<p>MCAR 16.2.1: The centers of PSU and SSUs of cycles 3 and 4 are theoretically coincided because the plots were established using the same design coordinates. However, when conducting the NFI cycle 4, if the SSUs centers of cycle 3 were found (using center marks), the SSUs of cycle 4 were established on the same centers as cycle 3. In the case the SSUs centers of cycle 3 were not found (due to lost of center marks), the SSUs centers of cycle 4 were established based on the designed coordinates and the GPS. For these cases, due to the errors of GPSs as well as human errors, the SSUs centers of cycle 3 and cycle 4 are not coincided but quite close to each other. The SSUs centers of cycle 5 are totally different from those of cycle 3 and cycle 4 (although the grid size is the same (8 km).</p> <p>This explanation will be added to the MR report to clarify how the plot centers were established throughout the changes in the design of the PSUs and SSUs. Text has been added to the ER MR by Vietnam, Section 3,2 page 21 in the table describing the sampling design.</p>
<b>Aster Global Findings - Round 3</b>	Thank you for the additional clarification in your response and within the MR. <b>This issue is closed.</b>

<b>Finding Number</b>	<b>17</b>
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<b>Guidelines on the application of the methodological framework Number 2 On technical corrections to GHG emissions and removals reported in the reference period</b>	a. The REDD Country Participant provides to FMT a complete description of the revised Reference Level as part of Annex 4 of the Monitoring Report;
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR - Annex 4
<b>Aster Global Findings - Round 1</b>	It is unclear to the audit team if the ER Program has consulted the FMT on the technical corrections applied.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please clarify in line with the finding.
<b>Round 1 Response from Client</b>	<ul style="list-style-type: none"> <li>At first, Vietnam did not intend to revise FREL. However, during the calculation process of the emission reductions for the reporting period, we have used the CO<sub>2</sub> density in 2015 interpolated from 2010 and 2019. As a result, in order to ensure the consistency between the FREL and the MR, we decided to revise the FREL but forgot to update the FMT about this. Nevertheless, the revision of the FREL does not impact much on the ERPA results.</li> </ul>
<b>Aster Global Findings - Round 2</b>	As stated by this criterion, the ER Program is required to notify FMT and provide a complete description of the updated Reference Level to FMT.
<b>Round 2 NCR/CL/OFI</b>	MCAR: Please provide verifiable evidence that FMT has been notified of this change.
<b>Round 2 Response from Client</b>	According to the guidance on technical corrections, paragraph 7, no notification should be submitted to the FMT when the corrections are within the framework of the positive list. The MR has already passed the Completeness Check successfully, which resulted in the FMT having shared the MR with the VVB. This was done in line with the Process Guidelines paragraphs 46 and 47. MCAR 17.2.1: On the "Summary of technical corrections" section of Annex 4 - CARBON ACCOUNTING - ADDENDUM TO THE ERPD", Vietnam provided justifications for the three technical

	<p>corrections made to the Reference Levels setting as follows:</p> <p>1) The activity data for two periods 2005-2010 and 2010-2015: In the ERPD, the activity data (AD) used for setting the Reference Levels are estimated based on area proportions derived from map classification, not from sample classification. Item 2.a.iii in the positive list of technical corrections in the Guidelines on the application of the methodological framework Number 2 - On technical corrections to GHG emissions and removals reported in the reference period (version 2.0, November 2020) states that acceptable technical corrections include: “Use more robust statistical estimator, including the replacement of map-based estimates by sample-based estimates using unbiased estimators, or replace sample-based estimates by more accurate/precise model based estimates.” Therefore, Vietnam has replaced the map-based AD estimates by the sample-based AD estimates for setting the Reference Levels. The detailed calculations of the sample-based AD estimates are provided in the file “Accuracy assessment”, which is available at: <a href="http://vnff.vn/erpa-program/data/emission-factors?hl=en">http://vnff.vn/erpa-program/data/emission-factors?hl=en</a></p> <p>2) The AGB densities/carbon densities for 2015: In the ERPD, AGB densities/carbon densities were assumed to be equal to those in 2010. In the MMR, the AGB densities/carbon densities in 2019 have been estimated based on plot measurement data of NFIMAP cycle 5 (period 2016-2020). With the new available of NFIMAP Cycle 5 data, it is possible to interpolate the 2015 AGB densities/carbon densities from those in 2010 and 2019 using the assumption that AGB densities/carbon densities change uniformly during period 2010-2019. It is commonly believed that interpolated values will have higher accuracy (i.e., less bias) than assumed values. Therefore, the use of the interpolated 2015 AGB densities complies with item 1.a in the positive list of acceptable technical corrections, which said: “Replacement of emission or removal factors by others with improved accuracy based on a new National Forest Inventory or terrestrial inventory or new national/local allometric models.”</p> <p>3) The uncertainties of the AD, emission factors, emissions and removals: In the ERPD, uncertainties for AD, emission factors, emissions and removals are reported at the 95% CI (two-tailed). In addition, the combined uncertainties for emissions and removals were estimated using the error-propagation method. However, Indicator 9.2 of the FCPF’s Carbon Fund Methodological Framework (Version 3, April 2020) requires: “Uncertainty of the estimate of Emission Reductions is quantified using Monte Carlo methods. Underlying sources of error in data and methods for integrated measurements of deforestation, forest degradation and enhancements (e.g., as in a national forest inventory) are combined into a single combined uncertainty estimate and are reported at the two-tailed 90% confidence level.” Item 3 in the positive list of allows “Corrections of material errors, omissions and misstatements identified in assumptions, data or calculations used to estimate the historical GHG emissions and removals reported in the reference period. Acceptable technical corrections include the correction of mistakes in calculations, transfer or transcript errors of data, or wrong application of IPCC default values.”. Therefore, uncertainties of the AD, emission factors, emissions and removals in the Reference Levels are re-estimated using the 90% CI (two-tailed) and the uncertainties of emissions and removals are re-estimated using a Monte Carlo method.</p> <p>We have added to the response that according to the guidance on technical corrections, paragraph 7, no notification should be submitted to the FMT when the corrections are within the framework of the positive list. The MR has already passed the Completeness Check successfully, which resulted in the FMT having shared the MR with the VVB. This was done in line with the Process Guidelines paragraphs 46 and 47.</p>
<b>Aster Global Findings - Round 3</b>	Thank you for the additional clarification. <b><u>This finding is closed.</u></b>

<b>Finding Number</b>	<b>18</b>
<b>Guideline on the application of the Methodological Framework Number 3 On the definition of reporting periods of Emission Reduction Programs</b>	1. REDD Countries are encouraged to propose Reporting Periods <sup>1</sup> aligned to calendar years (January to December) and that are multiple of one year;
<b>Requirement Met (Y, N, or Pending)</b>	Y
<b>Evidence Used to Assess (Location in PD, MR or Supporting Documents)</b>	MR
<b>Aster Global Findings - Round 1</b>	The stated reporting period is 01-02-2018 To 31-12-2019 which appears to violate this criteria.
<b>Round 1 NCR/CL/OFI</b>	MCAR: Please update the reporting period to ensure it is in line with this criteria or appropriately justify the use of the current reporting period in line with the "Guideline on the application of the Methodological Framework Number 3 On the definition of reporting periods of Emission Reduction Programs"
<b>Round 1 Response from Client</b>	•We checked and corrected that the reporting period in from 01/01/2018 to 31/12/2019. In the FCPF methodology framework, it is agreed to take ERPA implementation phase starting from 1 January 2018.
<b>Aster Global Findings - Round 2</b>	The audit team reviewed and confirmed that the reporting period has been corrected to correspond with calendar years (January to December). <u>This item is closed.</u>

## APPENDIX 2: LIST OF DOCUMENTS RECEIVED AND REVIEWED BY ASTER GLOBAL

Documents Received	Date Received
Instructions.pdf	June 15, 2021
00_FINAL ER-PD Vietnam 5 Jan 2018__0.pdf	June 18, 2021
EF_2010_2019.xlsx	November 16, 2021
FIPI_AD_NCC_2015_2019_HD_CE_v1.docx	June 15, 2021
Form 1 template_SAE_Sample_design_revised.docx	June 15, 2021
Form 2 template_SAE_Sample_Respond_revised.docx	June 15, 2021
Form 3 template_SAE_Sample_collection_revised.docx	June 15, 2021
Form 4 template_SAE_Training for Sample_collection_revised.docx	June 15, 2021
Form 5 template_SAE_Data_analysis_revised.docx	June 15, 2021
NCC_AD_2015_2019_final.xlsx	June 15, 2021
NCC_AD_accuracy_final.xlsx	January 5, 2022
SOP_1_Sample design_FCPF_Vietnam_NCC_v1.0_revised.docx	June 15, 2021
SOP_2_Sample respond_FCPF_Vietnam_NCC_v1.0_revised.docx	June 15, 2021
SOP_3_Data collection_FCPF_Vietnam_NCC_v1.0_revised.docx	June 15, 2021
SOP_4_Data analysis_FCPF_Vietnam_NCC_v1.0_revised.docx	June 15, 2021
Vietnam_1st ER Monitoring Report_18May2021_final_without Annex 1-3_0.pdf	June 17, 2021
Vietnam_1st ER Monitoring Report_18May,2021_final_without Annex 1-3.docx	July 2, 2021
01_Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis.xlsx	January 7, 2022
Partial Validation and Verification Sampling Plan signed.pdf	October 15, 2021
Aster Audit Plan 2021.pdf	October 15, 2021
FIPI Field inventory manual.docx	January 4, 2022
FIPI QA_QC protocol.docx	September 7, 2021
FIPI_Cluster_NCC_LL.kml	September 7, 2021
EF_2015_2019_location_shp_kml.kml	September 9, 2021
S2_6tinhh-20211015T023500Z-005.zip	October 14, 2021
BTB_RG_tinh_4_BTBT_S2A_Spectral_2019_2019_mosaic.tif	October 14, 2021
1_NCC_FCPF_AD_2015_2019_map.zip	September 13, 2021
ERP_EF_Data.rar	September 13, 2021
NCC_boundary.zip	September 13, 2021
NCC_BD_2015_2019_final.cpg	September 13, 2021
NCC_BD_2015_2019_final.dbf	September 13, 2021
NCC_BD_2015_2019_final.prj	September 13, 2021
NCC_BD_2015_2019_final.sbn	September 13, 2021
NCC_BD_2015_2019_final.sbx	September 13, 2021
NCC_BD_2015_2019_final.shp	September 13, 2021
NCC_BD_2015_2019_final.shp.xml	September 13, 2021
NCC_BD_2015_2019_final.shx	September 13, 2021
NCC_REDD_2015_2019_Vi.png	September 13, 2021
Bamb_NCC_Cycle5.txt	September 13, 2021
BiomassCalc_erp_cycle5_v3.R	September 13, 2021
QA_QC_Clusters.xlsx	September 13, 2021
Result_NCC_Cycle5_plots.txt	September 13, 2021

Result_NCC_Cycle5_sum.txt	September 13, 2021
SSU_NCC_Cycle5.txt	September 13, 2021
Tree_NCC_Cycle5.txt	September 13, 2021
NCC_boundary.cpg	September 13, 2021
NCC_boundary.dbf	September 13, 2021
NCC_boundary.prj	September 13, 2021
NCC_boundary.sbn	September 13, 2021
NCC_boundary.sbx	September 13, 2021
NCC_boundary.shp	September 13, 2021
NCC_boundary.shx	September 13, 2021
CV 4501SYT ngày 21.9.2021 Phòng chống dịch đối với người về từ vùng dịch.pdf	October 14, 2021
CV 4600UBND ngày 6.7.2021 Qua n lý người về từ vùng dịch.pdf	October 14, 2021
Biểu thống kê điểm kiểm tra.xlsx	January 4, 2022
RE Field trip to Nghe An Province.msg	October 14, 2021
VVB_RS_mtg.pptx	October 15, 2021
18.10.2021_ER validation_Document checklist_Hai.docx	October 25, 2021
Emission Factor 2010-2019 Eng V5_s1.docx	October 28, 2021
ENG_QUY_TRINH_QAQC_14_12_2017.docx	October 28, 2021
HDKTChumOMau_2018_Final_En_V2.2.docx	January 7, 2022
Methods for calculation of mean value and variance.docx	October 28, 2021
01_Updated Vietnam_M.C Analysis Phuong 22 April 2021 - Final_Auto sensitivity analysis_28.03.2022 Hung_10.04.2022_v2_Phuong 01.06.22_0609.xlsx	June 20, 2022
12.04.2022_FCPF verification QA_16Feb2022_responses_WB2_Phuong 01.06_CLE_0609.docx	June 20, 2022
12.04.22_Vietnam_FCPF MMR1 updated_wb_04_04_22_Phuong 01.06_CLE_0609.docx	June 20, 2022
15.06.22_Summary of changes in calculations.docx	June 20, 2022
2021_vietnam-fcpf-1st-er-monitoring-report.pdf	June 22, 2022
21074.00 FCPF Vietnam Round 1 Findings_VN 17.06.22.xlsx	June 21, 2022
annex-4_ad-report.pdf	June 22, 2022
annex-5_ef-report.pdf	June 22, 2022
annex-6_frel-report.pdf	June 22, 2022
emission-factor-2010-201_v5_s5_eng-11-4-22 (1).pdf	June 22, 2022
emission-reduction-program-document-erpd- (1).pdf	June 22, 2022
er-monitoring-report-er-mr-updated-12-4-22.pdf	June 22, 2022
Excel worksheet for calculating the FREL FRL, the ER for the first reporting period and the intergrated uncertainties using Monte Carlo analysis.url	June 22, 2022
NCC_AD_2015_2019_final.xlsx	June 22, 2022
EF_2010_2019.xlsx	August 17, 2022
NCC_AD_accuracy_final_Hung_v3_11.04.22.xlsx	June 22, 2022
NCC_MMR1_AD_2015_2019.cpg	June 22, 2022
NCC_MMR1_AD_2015_2019.dbf	June 22, 2022
NCC_MMR1_AD_2015_2019.prj	June 22, 2022
NCC_MMR1_AD_2015_2019.sbn	June 22, 2022
NCC_MMR1_AD_2015_2019.sbx	June 22, 2022
NCC_MMR1_AD_2015_2019.shp	June 22, 2022
NCC_MMR1_AD_2015_2019.shp.xml	June 22, 2022

NCC_MMR1_AD_2015_2019.shx	June 22, 2022
NCC_MMR1_FCM_2019.cpg	June 22, 2022
NCC_MMR1_FCM_2019.dbf	June 22, 2022
NCC_MMR1_FCM_2019.prj	June 22, 2022
NCC_MMR1_FCM_2019.sbn	June 22, 2022
NCC_MMR1_FCM_2019.sbx	June 22, 2022
NCC_MMR1_FCM_2019.shp	June 22, 2022
NCC_MMR1_FCM_2019.shp.xml	June 22, 2022
NCC_MMR1_FCM_2019.shx	June 22, 2022
NCC_REL_AD_2005_2015.CPG	June 22, 2022
NCC_REL_AD_2005_2015.dbf	June 22, 2022
NCC_REL_AD_2005_2015.prj	June 22, 2022
NCC_REL_AD_2005_2015.sbn	June 22, 2022
NCC_REL_AD_2005_2015.sbx	June 22, 2022
NCC_REL_AD_2005_2015.shp	June 22, 2022
NCC_REL_AD_2005_2015.shp.xml	June 22, 2022
NCC_REL_AD_2005_2015.shx	June 22, 2022
NCC_REL_FCM_2005.cpg	June 22, 2022
NCC_REL_FCM_2005.dbf	June 22, 2022
NCC_REL_FCM_2005.prj	June 22, 2022
NCC_REL_FCM_2005.sbn	June 22, 2022
NCC_REL_FCM_2005.sbx	June 22, 2022
NCC_REL_FCM_2005.shp	June 22, 2022
NCC_REL_FCM_2005.shp.xml	June 22, 2022
NCC_REL_FCM_2005.shx	June 22, 2022
NCC_REL_FCM_2010.cpg	June 22, 2022
NCC_REL_FCM_2010.dbf	June 22, 2022
NCC_REL_FCM_2010.prj	June 22, 2022
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