THE NATURE CONSERVANCY

VM0035: METHODOLOGY FOR IMPROVED FOREST MANAGEMENT THROUGH REDUCED IMPACT LOGGING (RIL-C) AND VMD0047 PERFORMANCE METHOD FOR REDUCED IMPACT LOGGING IN EAST AND NORTH KALIMANTAN

Document Prepared By: Rainforest Alliance

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Methodology Title	Methodology: VM0035 Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Module: VMD0047 Performance Method for Reduced Impact Logging in East and North Kalimantan	
Version	Methodology: Version 3.1, December 7, 2015 Module: Version 3.1, December 7, 2015	
	Methodology	X

Methodology Category	Methodology Revision	
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	Tool	
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Summary:	

The assessment of this new methodology framework and module evaluates whether or not the methodology and module have been prepared consistent with the guidance provided by the VCS Program, including Section 3 (project level requirements) and Section 4 (methodologies) of the VCS Standard and VCS AFOLU Requirements Version 3.

The project activities associated with the methodology that aims to reduce GHG emissions includes the implementation of reduced impact logging practices (hereafter termed RIL-C practices) in one or more of three GHG emission source categories: timber felling, skidding and hauling. RIL-C practices may entail a range of improved logging and harvest planning practices, such as, directional felling, improved log bucking (to permit greater recovery), improved harvest planning via pre-harvest inventory, skid trail planning and/or monocable winching, and reduction in area of haul roads and size of log landings.

Upon the acceptance of the Rainforest Alliance proposal for the VCS Second Methodology Assessment of the TNC RIL-C Methodology, the Rainforest Alliance audit team requested copies of the methodology documents which were provided by VCS on January 15, 2014 with additional documentation provided by TNC on February 3, 2015. An initiation call was held with the Audit Team and VCS on January 21, 2015. A separate initiation call was scheduled with development team and the auditors on February 5, 2014. Additional calls interviewing the development team covering auditor questions on the methodology were held on February 17 & 25, 2015.

The Rainforest Alliance auditors identified 17 findings of nonconformances (NCRs) against the applicable VCS standard criteria, as well as 16 Observation (OBS) findings. In response to the NCR & OBS findings the developers submitted multiple updated versions of the methodology framework and methodology module, along with supporting information to demonstrate conformance with the VCS standard requirements.

Based on the updated methodology framework and performance module documents provided for auditor review, it was determined that this methodology is in full conformance with the VCS Standards. All 17 NCRs were closed with satisfactory evidence. Nine OBSs remain open but this does not pose an obstacle to approval of the methodology or module as OBSs are non-binding nonmaterial findings. The final approved methodological documents are the VM0035 Methodology for Improved Forest Management Through Reduced Impact Logging (RIL-C), version 3.1, 7 December 2015 and VMD0047 Performance Method for Reduced Impact Logging in East and North Kalimantan, version 3.1, 7 December, 2015.

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1 INTRODUCTION

Rainforest Alliance certification and auditing services are managed and implemented within its RA-Cert Division. All related personnel responsible for audit design, evaluation, and certification/verification/validation decisions are under the purview of the RA-Cert Division, hereafter referred to as Rainforest Alliance or RA. Rainforest Alliance is an ANSI ISO 14065:2007 accredited validation and verification body; additionally, Rainforest Alliance is a member of the Climate Community and Biodiversity Alliance (CCBA) standards, and an approved verification body with a number of other forest carbon project standards. For a complete list of services provided by the Rainforest Alliance, see http://www.rainforest-alliance.org/climate.cfm?id=international_standards.

Dispute resolution: If Rainforest Alliance clients encounter organizations or individuals having concerns or comments about Rainforest Alliance and our services, these parties are strongly encouraged to contact the local Rainforest Alliance regional office or the RA-Cert Division headquarters directly. Formal complaints or concerns should be sent in writing.

1.1 Objective

The assessment of a new methodology will evaluate whether or not the methodology has been prepared consistent with the guidance provided by the VCS Program, including Section 3 (project level requirements) and Section 4 (methodologies) of the VCS Standard Version 3.

The scope of this assessment includes, as a minimum:

i. Applicability conditions: Assessment of whether the proposed methodology's applicability conditions are appropriate, adequate and in compliance with the VCS rules.

ii. Project boundary: Assessment of whether an appropriate and adequate approach is provided for the definition of the project's physical boundary and sources and types of GHGs included.

iii. Procedure for determining the baseline scenario: Assessment of whether the approach for determining the baseline scenario is appropriate, adequate and in compliance with the VCS rules.

iv. Procedure for demonstrating additionality: Assessment of whether the approach/tools for determining whether the project is additional are appropriate, adequate and in compliance with the VCS rules.

v. Baseline emissions: Assessment of whether the approach for calculating baseline emissions is appropriate, adequate and in compliance with the VCS rules.

vi. Project emissions: Assessment of whether the approach for calculating project emissions is appropriate, adequate and in compliance with the VCS rules.

vii. Leakage: Assessment of whether the approach for calculating leakage is appropriate, adequate and in compliance with the VCS rules.

viii. Quantification of net GHG emission reductions and/or removals: Assessment of whether the approach for calculating the net GHG benefit of the project is appropriate, adequate and in compliance with the VCS rules.

ix. Monitoring: Assessment of whether the monitoring approach is appropriate, adequate and in compliance with the VCS rules.

x. Data and parameters: Assessment of whether the specification for monitored and not monitored data and parameters is appropriate, adequate and in compliance with the VCS rules.

xi. Adherence to the project principles of the VCS Program: Assessment of whether the methodology adheres to the VCS Program principles set out in the *VCS Standard*.

xii. Relationship to approved or pending methodologies: Assessment of whether any existing methodology could reasonably be revised to serve the same purpose as the proposed methodology, determined in accordance with Section 5.2 of the VCS Methodology Approval process Version 3.

xiii. Public Review: Under the double approval process, new methodologies must be posted for public comment prior to the first assessment. Any comments made during this process will be reported here and addressed.

The methodology will be assessed against these thirteen criteria, in addition to those criteria required by the VCS Standard Version 3. Criteria one through twelve are outlined in the VCS Methodology Approval Process Version 3, and criterion 13 is an additional criteria required by the VCS Standard as part of the Double Approval Process. The following project level principles, based upon ISO 14064-2:2006, from Section 2.4 of the VCS Standard Version 3, shall form the principles considered in evaluating the methodology against the checklist criteria:

i. Relevance: Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.

ii. Completeness: Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.

iii. Consistency: Enable meaningful comparisons in GHG-related information.

iv. Accuracy: Reduce bias and uncertainties as far as is practical.

v. Transparency: Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence; and

vi. Conservativeness: Use conservative assumptions, values and procedures to ensure that GHG emission reductions or removal enhancements are not overestimated.

1.2 Summary Description of the Methodology

Additionality and Crediting Method	
Additionality	Performance Method
Crediting Baseline	Performance Method

The project activity constitutes the implementation of one or more reduced impact logging practices to reduce carbon emissions (hereafter termed RIL-C practices) in one or more of three GHG emission source categories: timber felling, skidding and hauling. RIL-C practices may entail

a range of improved logging and harvest planning practices, including, but not limited to, directional felling, improved log bucking (to permit greater recovery), improved harvest planning via pre-harvest inventory, skid trail planning and/or monocable winching, and reduction in width and length of haul roads and size of log landings.

The effectiveness of RIL-C practices, and accounting of emission reductions attributable to those practices, is assessed on the basis of their impacts post-harvest. Emission reductions are accounted for by applying a performance method approach, whereby an emission reductions (net of baseline and project emissions) are assigned as a function of the difference in measured impact (proxy) parameter between the project and a set crediting baseline for each emission source category (felling, skidding and hauling).

To ensure credible application of emission reductions, the impact parameters applied are quantitative and outcome-based, rather than process-based criteria that are typically limited to demonstrating that the practice is in place (but may provide no information on how successful the implementation of the practice is). Further, emission reductions are estimated as a continuous function with the (proxy) impact parameter values with which they correspond, providing better resolution of outcomes than a flat default factor. It has been ensured that emissions reductions achieved based on one impact parameter are not reversed by excessive emissions with respect to another impact parameter by requiring that all impact parameters must be at or below the crediting baseline in order for credits to be generated based on any one impact parameter.

Accounting is further simplified by incorporating the assumption that leakage equals zero and the wood products pool can be excluded because the methodology requires that there is no reduction in harvest levels.

Accounting is focused on emissions at the time of harvest from operations including felling, skidding and hauling, and delayed emissions from belowground biomass. Any net sequestration from comparatively improved growth post-RIL-C harvest is conservatively ignored.

Accounting of emissions reductions begins on the project start date and is accounted on all harvests through the project crediting period. Application of the methodology requires conservative accounting of *ex ante* emissions via processes to be developed and applied at the level of the module and/or project as appropriate. The methodology acknowledges the significant uncertainty inherent in *ex ante* projections as they are based on estimated harvest amounts for 10 years into the future, which are necessarily heavily influenced by annual weather conditions, management decisions, and regulatory decisions. However, *ex ante* procedures shall be applied in order to determine appropriate materiality thresholds for auditors to apply and to ensure projects do not provide overestimations of credit generation to potential investors and funders.

Methodology structure: This document is the framework for the methodology and outlines core accounting procedures. Key parameters (additionality benchmarks, crediting baseline, impact parameters and emission reduction equations) and monitoring procedures are provided in corresponding geographic-specific RIL-C performance method.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

Rainforest Alliance's Assessment of the VM0035 Methodology and VMD0047 Performance Method Module (the second assessment in the VCS methodology approval process) was guided by the VCS Methodology Approval Process document (Version 3.5), and included an evaluation of the applicable criteria in the VCS Standard (Version 3.4), and the VCS AFOLU Requirements (Version 3.4).

The audit team included a VCS Approved Standards Methods Expert, whose evaluation focused on the standardized methods aspect of the methodology. The Assessment consisted of an evaluation of all applicable methodology documents provided (see section 2.2 below), as well as multiple interviews with the development team via conference calls and email communications. The audit was carried out entirely as a desk based evaluation, and no field inspections of the eligible geographic area applicable to the performance method module took place.

2.2 Document Review

The following documents were viewed as a part of this methodology assessment:

Ref	Title, Author(s), Version, Date	Electronic Filename
1	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C), The Nature Conservancy, Version 2.0, 15 January 2015	RIL-C Methodology v2.0 JAN 2015.docx
2	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) with VCS Comments, The Nature Conservancy, Version 2.0, 15 January 2015	RIL-C Methodology v2.0 JAN 2015 + VCS.docx
3	VMD00XX Performance Method for Reduced Impact Logging in East Kalimantan, The Nature Conservancy, Version 2.0, 15 January 2015	RIL-C Performance Method Module v2.0 15 Jan 2015.docx
4	VMD00XX Performance Method for Reduced Impact Logging in East Kalimantan with VCS Comments, The Nature Conservancy, Version 2.0, 15 January 2015	RIL-C Performance Method Module v2.0 15 Jan 2015 + VCS.docx
5	Carbon Emissions Performance of Commercial Logging in East Kalimantant, Indonesia, Griscom/Ellis/Puts, Global Chance Biology, 2 August 2013	Griscom Ellis Putz 2014_logging emissions performance Ekali_GCB.pdf

6	Carbon Emissions Performance of Commercial Logging in East Kalimantant, Indonesia Supplemental Information, Griscom/Ellis/Puts, Global Chance Biology, 3 February 2015	Griscom Ellis Putz 2014_logging emissions performance Ekali_GCB_SuppInfo.docx
7	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Summary Source Data Workbook, The Nature Conservancy, 3 February 2015	Summary Source Data.xlsx
8	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Collateral Damage Workbook, The Nature Conservancy, 3 February 2015	Collateral damage.xlsx
9	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) First Assessment Report, ESI, 15 October 2014	026-TNC-Tropical Forest Methodology Assessment Report_Final_0.pdf
10	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Overview Presentation, TNC, 15 February 2015	Overview for launch call with RA.pptx
11	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Largo Stakeholder Comment, Simon Largo, 15 January 2014	RIL C Comment Largo.pdf
12	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Bronson Griscom CV, Griscom, 2014	Griscom_CV_2014.docx
13	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Griscom et al Responses to Editor and Reviewer Comments, Griscom, 6 July 2013	Griscom et al_Responses to Editor and Reviewer Comments_RI_GCB July 6 2013.docx
14	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Peter Ellis CV, Ellis, 2014	PeterEllisResume.pdf
15	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Shapefiles, TNC	RIL-C Methodology Shapefiles.zip (7 files)
16	VM00XX Methodology for Improved Forest	VCS RIL-C methodology_submission

	Management through Reduced Impact Logging (RIL-C) VCS Map Submission Form, TNC, December 16, 2013	form_tnc tff signature page.pdf

2.3 Interviews

The following interviews were conducted as part of the field audit:

Audit Date	Name	Organization, Title
21 January 2015	Andrew Beachamp	VCS, Program Officer
5, 25 February 2015	Bronson Griscom	TNC, Director, Forest Carbon Science
5, 17 February 2015	David Shoch	TerraCarbon, Director, Forestry and Technical Services

2.4 Assessment Team

Audit Team Composition:

Auditor Team Members (names, positions, and roles)	**Audit Tem Member Qualifications**
Campbell Moore, Associate Manager, Carbon services Rainforest Alliance, Lead Auditor	Campbell is a tropical forestry and REDD+ expert with international professional experience in Africa, Central America, South America and Southeast Asia. He is Carbon Expert with Rainforest Alliance where he conducts audits against six forest carbon standards, supervises methodology assessments, and acts as technical expert on carbon for RA-Cert globally. Campbell has experience on both the technical and policy sides of REDD+. Previous professional experience includes consulting work for GIZ Philippines performing carbon stock assessments of different forest types including agroforestry and plantation systems, as well as work centered on reforestation in Sri Lanka for the Environmental Leadership and Training Initiative. He additionally has worked for Climate Focus on LULUCF policy issues. From 2009-2011 Campbell pursued his Master of Forestry from the Yale University School of Forestry and Environmental Studies. This period included a variety of forestry projects including developing a management plan for Connecticut

	forest preserve, planning timber sales in a New England hardwood forest, and designing and modeling carbon sequestration potential of agroforestry systems for the Nature Conservancy's Global Climate Team. Prior to his time at Yale, Campbell worked in The Gambia for over two years as a Peace Corps Volunteer designing and implementing a wide variety of forestry, agroforestry, and agricultural projects. In addition to his Master of Forestry degree, he holds a M.A. in Environmental Studies from St. Mary's College. Campbell is fluent in Pulaar and Wolof and has experience with Spanish.
Lawson Henderson, Staff Auditor, Rainforest Alliance, Audit Team Member	Carbon Coordinator with Rainforest Alliance (2012 – current). Education: B.S.F. in forest management from University of New Hampshire, 2005. Experience, Forest Management Associate with Rainforest Alliance, US Region (2008 to 2012). Chain of Custody Associate with Rainforest Alliance, US Region (2007-2008). Forest Land Surveyor for a private forest/civil engineering firm in Western Oregon for two years. Auditor on more than 20 FSC forest management and chain of custody audits and assessments. Lead auditor or auditor on 16 forest carbon projects, including 14 IFM projects. Performed VCS audits of ARR, IFM, & REDD forest carbon projects. Project manager on over 250 forest management and chain-of-custody projects. Completed Rainforest Alliance CoC Auditor Training in April 2008, Rainforest Alliance Carbon Verification and Validation Audit Training in March 2009, and Rainforest Alliance Lead Forest Management Auditor Training in June 2009. Successfully completed the Climate Action Reserve Lead Verifier Training for the Forest Project, and Urban Forest Project Protocol in September 2010, CAR Lead Verifier credentials renewed in June 2014. Successfully completed the ISO Quality Management Systems Lead Auditor Training Course (ISO 9001) in December 2010. ARB Lead Verifier credentials obtained in October 2012. Member of the Society of American Foresters and the Forest Guild.
Luis de la Torre Vivar, Rainforest Alliance Contract Auditor, VCS Approved Standardized Methods Expert	Luis is climate financing and technology expert with international experience in mitigation projects globally due to his working experience at UNFCCC since 2007 as Meth Panel member and also WG CCS member; most of his work has been related to methodologies review, field assessments of CDM projects, financial assessment of projects, and tools for the mechanism. His professional experience is related to extractive industries, steel production and energy generation in LAM; actually he is EHS head of the largest oil refinery of Repsol Group in Peru and before that he worked in the gas downstream division as financial planning head in the same multinational since 2004. Additionally he contributes as member of working groups at Verified Carbon Standard, technical committees at UNDP and consultant for NIRAS in NAMAs development for waste and cement. Luis holds degrees in mechanical engineering and applied statistics from Catholic University of Peru, a MBA from Universidad del Pacifico, and higher studies at International Energy Agency

	(Paris, 2013), Energy Economics at U. of Houston (Houston, 2003) and Air Pollution from SMHI (Norrköping, 1998). His native language is Spanish but he is also fluent in English and German.
Janice O'Brien, Associate Manager, COC, RA-Cert Canada	Janice has a Master's Degree in Forest Conservation from the University of Toronto and has been with Rainforest Alliance for over 8 years. She is a certified ISO lead auditor, Carbon Forest Offset Project Auditor, and Chain of Custody Auditor. She has completed a training program in GHG Accounting for Forests and participated as lead auditor for Chain of Custody audits in Canada, the US and Mexico, and Carbon audits in Canada, the US, Africa, India, Central and South America, and Australia. She has coordinated approximately eight hundred Chain of Custody audits and assessments, conducted approximately fifty assessments/audits, completed nine Forest Carbon audits, and participated in one Forest Management audit. Prior to joining Rainforest Alliance she worked in operational and financial risk management for 13 years, and has extensive experience as a Manager, Customer Service and Administration with one of the top financial service providers in Canada.

Auditor(s)	Responsibilities							
	Lead	**Desk Review**	**On-site visit**	**Climate Specialist**	**Biodiversity Specialist**	**Social Specialist**	**Report**	**Senior Internal Review**
Campbell Moore	☒	☒	☐	☒	☐	☐	☒	☐
Lawson Henderson	☐	☒	☐	☒	☐	☐	☒	☐
Luis de la Torre Vivar	☐	☒	☐	☒	☐	☐	☐	☐
Janice O'Brien (technical reviewer)	☐	☐	☐	☐	☐	☐	☐	☒

2.5 Resolution of Findings

In response to the nonconformances (NCRs) and Observations (OBS) raised in the draft assessment report, the Developers submitted updated methodology documents and additional evidence to the auditors on 21 May 2015. The auditors conducted a second review of the methodology and conformance with the NCRs initially raised in the draft report. All NCRs were successfully closed. See associated findings in Appendix A of this report as well as the assessment conclusions in section 4 of this report.

Action Taken by Project Proponent following the issuance of the Draft Report		**Date**
Additional documents submitted to audit team (additional documents listed below)	☒ Yes ☐ No ☐ N/A	21 May 2015 12 June 2015
Additional stakeholder consultation conducted (evidence described below)	☐ Yes ☐ No ☐ N/A	
Additional clarification provided	☒ Yes ☐ No ☐ N/A	21 May 2015 12 June 2015
Documents revised (document revision description noted below)	☒ Yes ☐ No ☐ N/A	21 May 2015 12 June 2015 7 December 2015

Included in the actions taken by the Developers to address NCRs was the submission of the following revised files & supporting evidence:

Ref	**Title, Author(s), Version, Date**	**Electronic Filename**
1a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) NCR Responses, The Nature Conservancy, 21 May 2015	NCR responses RIL-C Apr2015valid2.docx
2a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Revised Methodology	RIL-C IFM Methodology DRAFT Apr2015 valid2 revision.docx

	Framework, The Nature Conservancy, 21 May 2015	
3a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Revised Performance Method Module, The Nature Conservancy, 21 May 2015	RIL-C Performance Method Module DRAFT Apr2015 valid2 revision.docx
4a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Justification for Revision of HAUL Impact Parameter, The Nature Conservancy, 21 May 2015	Justification for Revision of HAUL Impact Parameter.docx
5a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) Revised HUAL Impact Parameter Calculation Workbook, The Nature Conservancy, 21 May 2015	Revised calculations of HAUL.xlsx
6a	Carbon Emissions from Tropical Forest Degradation Caused by Logging, Pearson et al, 31 March 2014	Pearsonetal2014_CO2emissionsfrom logging.pdf
7a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) 2nd Revised Performance Method Module, The Nature Conservancy, 12 June 2015	RIL-C Performance Method Module DRAFT apr2015 valid2 revision 2.docx
8a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C) 2nd Revised Methodology Framework, The Nature Conservancy, 12 June 2015	RIL-C IFM Methodology DRAFT Apr2015 valid2 revision 2.docx
9a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C), Version 2.0, 23 June 2015	RIL-C IFM Methodology DRAFT June2015.docx
10a	VM00XX Performance Method for Reduced Impact Logging in East and North Kalimantan, Version 2.0, 23 June 2015	RIL-C Performance Method Module DRAFT June2015.docx
11a	VM00XX Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C), Version 3.0, 21 September 2015	RIL-C IFM Methodology DRAFT clean 21Sep2015.docx
12a	VM00XX Performance Method for Reduced Impact Logging in East and North Kalimantan, Version 3.0, 21 June 2015	RIL-C Performance Method Module DRAFT clean 21Sep2015.docx

13a	VM0035 Methodology for Improved Forest Management through Reduced Impact Logging, Version 3.1, 7 December 2015	RIL-C IFM Methodology DRAFT 7Dec2015.dox
14a	VMD0047 Performance Method for Reduced Impact Logging in East and North Kalimantan	RIL-C Performance Method Module DRAFT 7Dec2015.docx

3 ASSESSMENT FINDINGS

This evaluation involved a review of the methodology documents and supporting materials as well as interviews with the developers. While several nonconformances with the applicable VCS Standard requirements were raised in the draft assessment report, these were successfully addressed by the Developers and subsequently closed out by the auditors. Based upon the final methodology framework, performance module and supporting documents provided, auditor assessment of the VM0035 methodology and VMD0047 module found that they were developed in conformance with the applicable VCS standard requirements, including the VCS principles of relevance, completeness, consistency, accuracy, transparency and conservativeness. The defined applicability conditions were generally found to be appropriate for the associated project activities and all required and relevant carbon pools are included within the project boundary. Determination of the baseline scenario is in conformance with the VCS standards utilizing a performance method. The process for projects to demonstrate additionality also appropriately utilizes a performance method.

3.1 Relationship to Approved or Pending Methodologies

The methodology developer asserts that as of the date of submission, no approved or pending methodology under the VCS Program, or any other approved GHG program, is available accounting emission reductions from Reduced Impact Logging as a project activity.

Auditor investigations of the approved and pending methodologies under the VCS program found that there are no similar methodologies available that account for emission reductions from Reduced Impact Logging project activities. While there are approved Improved Forest Management (IFM) methodologies under the VCS program none have been developed to include Reduced Impact Logging (RIL) as an eligible IFM activity. Further, VM0035 and VMD0047 were confirmed to be the first VCS AFOLU methodology that follows a standardized method approach.

Auditor review of the IFM protocols and methodologies under the other major voluntary carbon standards/programs (e.g. CAR, GS, ACR, CCB) that could become an approved GHG program under VCS, confirmed that there currently exists no methodologies that include RIL as an eligible project activity.

Auditor assessment revealed that there are no similar methodologies or approved GHG programs that could have been reasonable revised to meet the objectives of VM0035 and VMD0047. No other approved or pending VCS AFOLU IFM methodologies include RIL as an eligible project activity, and therefore the auditors found the development of this methodology to be appropriately justified.

3.2 Stakeholder Comments

The VM0035 methodology and VMD0047 was open for public comment from 14 January 2014 through 13 February 2014. During this time period a total of three stakeholder comments were received, including two comments on the methodology, and one comment on the associated Performance Method Module. A web-based presentation on the draft methodology was also given by the development team on 22 January 2014, which was recorded and is available for viewing on the VCS website. This web-based presentation also provided an avenue for interested individuals and organizations to raise comments and questions on the draft methodology. Solicitation of feedback from this presentation was taken into consideration by the development team with the overall goal of improving the outcome of the methodology.

Further, a workshop was developed with participation of four international scientists and local operators of the applicable region. This expert consultation process described in the module (Appendix A) covered enough expert judgement of the Methodology and the validity of the factors used. The auditors found that the mixture of experts involved in this workshop was sufficient to cover the main parameters of the module.

The table below outlines the comments received, the developer's response to the comments, and the associated auditor findings.

Individual & Organization submitting comments	Comment received	Developers response	Auditor findings
Bruce French U.S.A	I respectfully suggest you explore linking-up with the International Biochar Initiative: http://www.biochar-international.org/ and possibly Cornell University: http://www.css.cornell.edu/faculty/lehmann/research/terra%20preta/terrapr	An interesting idea; however, biochar is beyond the scope of our draft VCS RIL-C methodology. We have conservatively excluded the soils pool from calculations of baseline and avoided emissions.	No action has been taken by the developer in response to this comment. The auditors found that the developers took this comment into consideration, and based on their response, have demonstrated the insignificance and/or irrelevance of the comment

	etamain.html. Doing so could enhance your efforts regarding the "New Reduced Impact Logging Methodology" by incorporating biochar and terra preta into this (and other) VCS project(s).		in accordance with the VCS Methodology Approval Process. In response to the comment, the developer has confirmed that biochar is outside the scope of the proposed methodology, and that soils pool has been conservatively excluded from calculations of baseline and avoided emissions.
Simon Largo Silva Ecosystem Services, LLC Chile	Reduced Impact Logging practices that reduce Carbon Emissions (RIL - C) must include harvest planning practices (skids/roads) associated with an improved logging system such as: a non-guy line yarding combined with a Cut-to-Length for a medium topographic condition (35 - 100 %). This combined yarding/forwarding method could be the optimum logging method for the maximum environmental protection in timber harvesting operations. I would like that you can consider this proposal as a part of the RIL - C methodology.	We agree with this observation. Appropriate impact parameters will need to be developed and calibrated for each logging landscape through the development of geography specific modules. In the case of East Kalimantan (the first geography-specific module included with the framework methodology), our skidding impact parameter (SKID) would capture the emissions reductions from the improved skidding technologies – specifically long-ling winching systems, which are the principle reduced impact skidding technology available in this region. As a more general observation, it is important to understand that RIL-C involves both "RIL-C MRV" (i.e. the draft VCS methodology, including geography-specific modules), and "RIL-C Practices". Our RIL-C MRV methodology is designed to	The auditors concur with the developer's response to this stakeholder comment received, in that the skidding impact parameter applied (SKID) will capture the emission reductions from improved skidding technologies, in which, long-ling winching systems are currently the primary reduced impact skidding technology available in this region (East Kalimantan, Indonesia). The auditors found that the developers took this comment into consideration, and based on their response, have demonstrated the insignificance and/or irrelevance of the comment in accordance with the VCS Methodology Approval Process.

		be “open source” – that is, it is designed to verify emissions reductions from a wide range of RIL practices, both those already exist (e.g. TFF RIL standard©) and those emerging to more specifically target emissions reductions (e.g. “RIL-C Practice guidelines” in development – which are not formally related to VCS RIL-C methodology). Also, it is important to be aware of a qualifier: there are limitations to the detection of emissions reductions by our initial set of impact parameters. In other words, our initial set of impact parameters for the East Kalimantan module are conservative and will not detect all of the benefits from all potential RIL-C practices. While our impact parameters will detect most emissions reductions (e.g. those achieved by use of long-line winching technology), new impact parameters will need to be developed to detect some more nuanced emissions reductions practices (e.g. cutting lianas).	
Anonymous Technological Research Institute – IPT - São Paulo Brazil	Interesting method to estimate and reduce emissions from logging operations. Has it been tested? How does it work in tropical forests other than those of East	We are testing the draft VCS RILC East Kalimantan module with logging concessionaires in East Kalimantan now. While the draft framework VCS RIL-C methodology provides a	No action has been taken by the developer in response to this comment. The auditors found that the developers took this comment into consideration, and based on their

	Kalimantan, such as in Central and South America and Africa? Have specialists assessed it? Will such issues be addressed to in the coming webinar?	framework for the development of modules for other logging landscapes (i.e. other countries and ecoregions), other modules have yet to be formally drafted. We are aware of initial efforts towards developing such modules in southern Mexico and eastern Peru.	response, have demonstrated the insignificance and/or irrelevance of the comment in accordance with the VCS Methodology Approval Process.

3.3 Structure and Clarity of Methodology

The auditors found the methodology to be generally written in a clear, logical, concise and precise manner. As permitted by VCS, VM0035 employees a modular approach in which the framework document provides the overall structure of the methodology, and includes a separate module (RIL-C Performance Method Module) to be used to perform specific methodological tasks. The methodology clearly uses performance methods for the categories of felling, skidding and hauling activities included in the RIL-C project activities. The methodology clearly explains how to assess factors for the baseline and project activities and appropriately sets the conditions for additionality. The developer has correctly used the VCS Methodology Template for the framework document, and the VCS Module Template for the associated module.

However, the following concerns pertaining to the structure and clarity of the methodology have been raised.

Section 5.1 of the methodology module provides a description of the sampling approach that was followed for derivation of the impact parameters, crediting benchmarks, and additionality benchmarks. This description indicates that a stratified random sample was used, but also implies the sample was biased towards logging concessions in which TNC had an existing relationship and concessions that were FSC certified. The study used for the development of the module discusses the use of a stratified random sample with one exception, which is that the sample included a greater number of FSC certified concessions in order to be conservative. This sampling approach results in lower baseline levels compared to what is actually expected to occur on the ground. This should be clarified and as a result an Observation has been raised.

Several figures throughout section 5 of the module (procedures) do not include a title identifying the contents of the figure. For increased clarity, the developers should include a title on each figure throughout the module. As a result an Observation has been raised.

3.4 Definitions

The auditors found the methodology to properly utilize the definitions outlined in the VCS Program Definitions document (v3.5). Section 3 of the methodology provides the definitions for the relevant terms that apply to the methodology which were found to be clearly defined. The key definitions identified are outlined in alphabetic order and do not include any terms already defined in the VCS Program Definitions document (v3.5). The terms defined in section 3 of the methodology were also found to be consistently used throughout the methodology.

Both the carbon pools "aboveground tree biomass" and "deadwood" are includes in what appears to be an overarching pool "aboveground carbon." This overarching term "aboveground carbon" is not a term included in the definitions in either the methodology framework or performance module. As a result an Observation has been raised.

All scientific references used in the methodology framework and the performance module have been appropriately cited in the methodology and the sources reviewed in the course of this methodology assessment have been appropriate and from reputable sources.

3.5 Applicability Conditions

Project – Specific Applicability Conditions from the Methodology Framework:

Applicability Conditions	Auditor findings
1. The project activity does not involve a deliberate reduction in harvest levels. The criteria to demonstrate no intentional reduction in harvest levels are provided in the applicable RIL-C performance method module.	As described to the auditors, this applicability condition was included to simplify application of the methodology, exclude the possibility of significant leakage (no leakage), and also allows for the exclusion of the harvested wood products pool (inputs into harvest wood remain the same). The approach of devolving the creation of applicability criteria to prevent leakage from occurring to the level of performance method modules is in conformance with the VCS principles as this is more accurate than attempting to create overarching quantifiable methods for demonstrating no reduction in harvest across the potentially global scale of future module locations.
2. The project activity and the baseline scenario do not involve conversion of forest to non-forest land use/land cover (i.e. Both represent forest remaining as forest, *sensu* IPCC GL 2006).	This applicability condition was found to be appropriate by the auditors, and will ensure that eligible projects will adhere to the requirements of section 4.2.3 of the VCS AFOLU Requirements stipulating that for AFOLU IFM methodologies, "The baseline and project scenarios for the project area shall qualify as *forests remaining as forests*…".

3. In every year credited, the project proponent must hold legal authorization, for all logging activities referenced in the project, from the relevant government authority through the crediting period.	As discussed with the developers, the intent behind this applicability condition is to ensure that the IFM project and related RIL-C harvest activities are legally permissible. The auditors determined this applicability condition to be appropriate and consistent with section 4.4.4, item 2) of the VCS AFOLU requirements that stipulate the need to adhere to the legal requirements of forest management and land use in the area (unless verifiable evidence is provided demonstrating that common practice in the area does not adhere to such requirements). This applicability condition which requires the Project Proponent to hold legal authorization, for all logging activities referenced in the project, from the relevant government authority, *in every year credited* addresses the initial concern that the original applicability condition would prevent certain types of situations and/or concessions from being eligible from using this methodology, when this was not the specific intent by the developers. As communicated by the Developers, the intent behind this applicability condition is to ensure that the IFM project and related RIL-C harvest activities are legally permissible, and the auditors find the revised applicability condition to fulfil this intent.
4. The project area must be located in a logging landscape developed for a corresponding region-specific RIL-C performance method. It must be demonstrated with GIS analysis that the entire project area is contained within the applicable logging landscape.	The geographic limits set by this applicability condition (a logging landscape developed for a corresponding region-specific RIL-C performance method) was found to be appropriate and consistent with the requirements of section 4.3.5 of the VCS Standard, which stipulates that "the applicability conditions shall establish the scope of validity of the methodology…, including the geographic scope." Currently the methodology is accompanied by a single region specific performance method module for a defined logging landscape in East Kalimantan, Indonesia.
5. The entire project area meets the definition of forest, either host country-specific UNFCCC or FAO definition.	While this applicability condition does not appear to address any specific VCS requirement (this is an explicit requirement for REDD methodologies under section 4.2.5 of the VCS AFOLU Requirements, but this is not specified for IFM methodologies), the auditors found it to be appropriate and consistent with the requirements of 4.2.3 of the VCS AFOLU Requirements stipulating that for AFOLU IFM methodologies, "The baseline and project scenarios for the project area shall qualify as *forests remaining as forests*…". This applicability condition is also considered to be complementary with the first applicability condition of the methodology framework.

New Region-Specific Performance Method Applicability Conditions from the Methodology Framework:

Applicability Conditions	Auditor findings
1. The performance method must conform to all relevant VCS requirements[1] for performance methods.	The auditors find this to be an appropriate new region-specific performance method applicability condition, as it is clear that any new region-specific performance methods that are developed and to be applied with this methodology framework need to be in full conformance with the applicable VCS requirements for performance methods. The auditors however note that the foot note in this performance method applicability condition is missing from the methodology framework document. As a result an Observation has been raised.
2. The performance method must clearly specify the logging landscape, and timeframe within which the values/relationships are applicable (i.e., the sample population). The logging landscape must be defined by broad parameters of consistent forest structure and composition, for example the WWF Forested Ecoregions (Olson et al. 2001).	This applicability condition appears to be consistent with the requirements of the VCS standard, section 4.3.5 & 4.3.6, and the requirements that; (4.3.5) "the applicability conditions shall establish the scope of validity of the methodology, and where multiple benchmarks are established, each performance benchmark, including the geographic scope…" and (4.3.6) "the applicability of the methodology or performance benchmark shall be limited to the geographic area for which data are available…". With regards to the need for the performance method to clearly specify the "…timeframe within which the values/relationships are applicable (i.e., the sample population)", and if this is meant to refer to the time period before the benchmark needs to be reassessed. When discussed with the developer, they indicated that the intent was for this to be included in the module, and that the default values and proxy factors have 5 year default values. However, this was based upon their assumption that the performance method requirements do not allow values to be used for longer than 5 years. The audit team, including the standardized methods expert, understand the requirement such that the benchmarks do not need to be updated if the analysis of trends demonstrates that the baseline scenario is not leading to decreasing emissions over time. If so, an adjustment factor shall be included in the benchmarks reflecting this. The analysis of trends provided in the module Section 5.1.1 demonstrates that the inclusion of the three FSC certified concessions results in a sample significantly more conservative with regards to the baseline than the population of concessions. FSC certification is used, appropriately based on auditor expert judgment, as a proxy for increased probability of using new technologies which generate less emissions. Thirty percent of the sample used to develop the crediting and additionality benchmarks was FSC certified concessions, which at current rates of uptake of FSC

	certification in the region, is more than could be expected by 2024 when the 10 year AFOLU baseline revision requirement would come into effect. Conformance has been demonstrated.
3. The performance method must define additionality and crediting baseline in terms of impact parameters. Impact parameters must cover the following three sources of logging emissions: felling, skidding and hauling. One or more impact parameters may be identified for each of the three emissions source categories (felling, skidding, and hauling). When more than one impact parameter is identified for an emissions source category, they must be measures of distinct (non-overlapping) components of that emissions source category.	This performance method applicability condition and the need to define additionality and crediting benchmarks in terms of impact parameters that cover these 3 sources of emissions (felling skidding and hauling), was found to be appropriate. Impact parameters associated with these emission sources are consistent with section 4.2.4 of the VCS AFOLU requirements and associated activities that increase carbon stocks. The condition that "when more than one impact parameter is identified for an emissions source category, they must be measures of distinct (non-overlapping) components of that emission source category" is also appropriate and is will ensure that the relevant components of any one of the given emission source categories are not over estimated.
4. The performance method must relate emission reductions to impact parameters and quantify and discount uncertainty in the dependent variable (emission reductions). Emission reductions are calculated from (base) emissions associated with the crediting baseline value. Relationships between impact parameters and emission reductions must be developed for above and belowground tree biomass for each emission category (logging, felling and hauling)	This performance method applicability condition and requirement to quantify and discount uncertainty in the dependent variable (emission reductions) was found to be appropriate. It is clear that any new region-specific performance methods that may be developed will need to establish relationships between impact parameters and emission reductions for the carbon pools affected by the project activities, including aboveground and belowground tree biomass under each emission category (logging, felling and hauling). Consistent with the requirements of the VCS standard section 4.8, the units of measurement for the impact parameters in section 8.2 of the methodology framework have been defined and are identified as t CO2e/ha.

and expressed in units of t CO_2/ha (aboveground tree biomass) and t CO_2e/ha/year (belowground tree biomass, fully decomposing in 10 years at a constant rate).	
5. The performance method must specify monitoring procedures for all defined impact parameters.	This performance method applicability condition was found to be appropriate. Defined monitoring procedures for all defined impact parameters will ensure that these parameters that serve as a proxy for emissions can be consistently measured and quantified in the field.

Methodology Performance Module Applicability Conditions:

Applicability Conditions	Auditor findings
1. This module must be applied in conjunction with VM035 Methodology for Improved Forest Management through Reduced Impact Logging (RIL-C).	It is clear that this is an appropriate applicability condition for the module, and consistent with the requirements of the VCS Standard section 4.1.3, indicating that "methodologies may employ a modular approach in which a framework document provides the structure of the methodology and separate modules and/or tools are used to perform specific methodological tasks."
2. Projects must be located in the logging landscape within which parameters set out in this module are applicable, as shown in Figure 1, and characterized as: • Commercial logging concessions located in East and North Kalimantan, Indonesia, in standing Bornean *Dipterocarp* forest on latosols. • The class of	It is clear that it is appropriate to have a methodology module applicability condition that requires projects to be located in the logging landscape for which the parameters established in the module are applicable. In terms of how the applicable logging landscape is characterized, the module states that it applies to "commercial logging concessions located in East Kalimantan, Indonesia, of Bornean Dipterocarp forest on latosols." And "the class of actors/sector is commercial concession holders." These characterizations do not specify what is considered a commercial logging concession in terms of ownership, size, or management practices etc. When this was discussed with the developers, the auditors were told that the intent was that the applicable logging landscape was to match the study used for the development of the module (documents 5 & 6) which included a comprehensive sample of all commercial logging concessions in East Kalimantan, Indonesia.

actors/sector is commercial concession holders. • The major logging system is diameter limit selective harvest in which lower diameter does not fall below 50 cm DBH, or diameter above buttresses. Newly designated legal logging concessions within East and North Kalimantan – that may be outside of the zone depicted in Figure 1 – may be included in the applicable logging landscape if it can be demonstrated that the new concession is consistent with the three characteristics of the mapped logging landscape depicted in Figure 1. It must also be demonstrated that the project areas of new concessions do not occur in previously un-accessed (i.e. "virgin") forests.	The developer indicated that a legal term for commercial logging concessions does exist, and was used in the study. This legal term for commercial logging concessions should be incorporated into the applicability condition or elsewhere in the module. As a result an Observation has been raised. Figure 1 of the module clearly displays the geographic location of the logging landscape. Based on this applicability condition, and the defined logging landscape in figure 1 of the module, the auditors originally questioned if there would be limitations to applying the module on any newly designated dipterocarp forest on logging concessions on latisol soils. The developers' response was that they did not want to prevent such new concessions from being eligible to apply this methodology & module, but that they did want to prevent crediting of projects in virgin forests. This intent is now clearly described in the updated performance module reviewed by the auditors.
3. Projects must consist of logging concession during years when the average harvest intensity within the annual cutting block does not fall below 16 m^3/ha, below which it is assumed that a deliberate reduction in harvest level has occurred. Projects may be eligible for crediting during years that harvest intensity falls above 16 m^3/ha, while being ineligible for crediting during years that harvest intensity falls below	This methodology module applicability condition appears to have the intension of restricting projects from having an average harvest intensity within the annual cutting block below 16 cubic meters per hectare in a given year. This is based on the harvest intensity, one standard deviation below the mean harvest intensity in the sample that the Griscom et al 2014 paper and the performance benchmarks are based upon. This approach is an appropriate means of mitigating any risk that RIL-C projects could attempt to generate credits by simply harvesting less timber and also serves to ensure that concessions applying the module are comparable to those the performance benchmarks are based upon. Should the harvest intensity fall below the defined thresholds in any given year, the project won't automatically become ineligible, but will rather just be ineligible for crediting for that year.

16 m^3/ha.	

3.6 Project Boundary

Carbon Pools	Included in the project and baseline scenarios?	Justification/Explanation	Auditor findings
Aboveground tree biomass (included in aboveground carbon, AGC)	Yes	Must be included – represents a significant pool affected by the project activity	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has included aboveground tree biomass. The methodology has also included aboveground deadwood in this pool and refers to the pool using the term "aboveground carbon" (AGC). The auditors find the inclusion of this carbon pool to be appropriate in the methodology. The term aboveground carbon has not been explicitly defined however, and should be incorporated into the definitions section of the methodology. As a result an Observation has been raised.
Aboveground non-tree biomass	No	Conservatively excluded – this pool is expected to increase relative to the baseline as a result of the project activity (from reduced skidding damage)	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has excluded the aboveground non-tree biomass pool from the project boundary. The auditors find the exclusion of this pool to be appropriate, and conservative, given that this pool is expected to increase relative to baseline levels as a result of the project activities.

Belowground biomass	Yes	Must be included – represents a significant pool affected by the project activity	According to Table 2, in section 4.3.1 of the VCS AFOLU Requirements, the inclusion of this pool is optional, and may be excluded from the project boundary. The developer has elected to include this pool, and asserts that this pool must be included as it represents a significant pool affected by the project activity. The auditors concur. The justification/explanation for the inclusion of this pool has however been expanded to state; "Must be included in all cases – represents a significant pool affected by the project activity." The Developer's asserts their position that for VCS AFOLU methodologies, the methodologies may be more stringent than the methodological guidance, and that by requiring this pool "in all cases" they have essentially set a criterion for when projects shall or may include the pool. In this case, they are explicitly requiring the inclusion of the belowground biomass pool, and that this pool is not being treated as an optional pool in the methodology. The auditors concur with these assertions made by the Developers. The expanded justification/explanation for the mandatory inclusion of this pool in the project and baseline scenario (*Must be included in all cases*) was found to be appropriate to the auditors.
Dead wood (included in aboveground	Yes	Standing and lying dead wood produced by harvest are included. Changes in stocks of pre-existing	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has included

carbon, AGC)		dead wood are conservatively ignored (further explained below).	the deadwood pool. The elements of the deadwood pool included are limited to standing and lying dead wood produced by harvesting activities (i.e. Slash and new standing dead wood from harvest and collateral damage). Changes in stocks of pre-existing deadwood are said to be conservatively ignored, and the developer asserts that these stocks are expected to be greater in the with-project case post-harvest due to less impact from RIL-C practices. Assurance that this assumption is correct is supported by the applicability condition that requires that the project activities do not include slash management, salvage harvesting or other planned removal of dead wood. The deadwood pool is included in what the developer is calling aboveground carbon (AGC) which includes both live and dead (standing and lying) pools.
Harvested wood products	No	The applicability condition "The project activity involves no change in harvest levels from the baseline practice" allows for exclusion of the wood products pool because there is no difference in harvest levels between baseline and project scenarios.	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has excluded the harvested wood products pool. The auditors find the exclusion of this pool to be appropriate given the applicability condition that requires the project activities to have no changes in harvest levels from the baseline scenario.
Litter	No	No significant change is expected in this pool as a result of the project activity	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has excluded the litter pool. Further, the

			auditors find the exclusion of the litter pool appropriate given the applicability condition that there is no difference in harvest levels between the baseline and project scenarios, and therefore no changes in the litter pool are expected.
Soil	No	No significant change is expected in this pool as a result of the project activity	In accordance with Table 2, in section 4.3.1 of the VCS AFOLU Requirements, VM0035 has excluded the soil carbon pool. Further, the auditors find the exclusion of the soil carbon pool appropriate given the applicability condition that there is no difference in harvest levels between the baseline and project scenarios, and therefore no changes in the soil carbon pool are expected.

Geographic boundaries:

The methodology framework defines the geographic area of the project boundaries (Project Area) as the area over which the project proponent holds legal authorization from the relevant government authority to conduct timber harvest over the length of the project crediting period. It is not clear if the Project Area has to be the whole area in which the proponent has authority to conduct logging or if the Project Area can be a subset of this area that is defined by the proponent. Discussions with the developer indicated that the Project Area doesn't have to be the entire ownership of the proponent, but that the Project Area needs to be defined at validation. Clarity in this regard should be incorporated into the methodology. As a result an Observation has been raised.

3.7 Baseline Scenario

As specified in the methodology, the baseline scenario to be applied in this methodology is set by the region specific RIL-C performance method, represented by aggregate logging operations that are operating at a specified level of performance within the applicable logging landscape. The associated performance methodology module outlines the process for determination of the baseline scenario which is established by impact parameters that set the crediting and additionalilty benchmarks. The developers have clearly opted for specific standardized method approach for the applicable region.

The performance module, section 5.1, presents the impact parameters for the applicable geographic area (East Kalimantan, Indonesia) used for establishing the crediting and additionality benchmarks for the impact parameters. Performance benchmarks outlined in the module, consisting of impact parameters, crediting benchmarks and additonality benchmarks were found to be relevant to the RIL-C project activities. A peer-reviewed region specific scientific study (documents #5 & 6) were appropriately used for the establishment of the performance benchmarks and the associated analysis was used to establish the baseline scenario in conformance with the VCS requirements. Data was directly taken from logging concessions in the applicable region and analysed with appropriate statistical techniques including expert review and consultation.

Sampling methods for the establishment of the performance benchmarks are generally outlined in the module (section 5.1) and covered in more detail in the associated study (documents #5 & 6). This study (Griscom et al. 2014) involved an analysis of nine logging concessions in East Kalimantan, Indonesia that was carried out in 2012. The developers note that although the sample was random, it was biased toward concessions that were FSC certified. The developers assert that this approach was taken to ensure conservativeness in the sample and performance benchmarks established, as it resulted in a lower baseline than what was actually expected to be occurring within the logging landscape. The auditors accept this sampling approach. The sampling approach should clearly indicate that the stratified random sample had one exception; a greater number of FSC certified concessions in order to be conservative, and as a result an Observation has been raised.

The developer supplied spreadsheets with detailed calculations on samples used, main parameters, statistical analysis (ANOVA), determination of factors and main correlations. The confidence levels expressed in the analysis is at the 90-95% confidence interval. The assumptions and analysis of uncertainties is covered in the methodology and supporting papers. In general the baseline setting is conservative and authors have taken into account the potential mixture of FSC and non FSC concessions among other elements and slopes in terrain. The methodology and module are based on two documents, the first is a study by K. Mokany et al (2006) which supports the calculation of root/shoot ratios for estimation of biomass; the second is a paper by Griscom et al (2014) that reports in detail the case of East Kalimantan for adoption of RIL-C. The Griscom study reviews effects of practices such as FSC and use of mono cable winching for timber extraction. The author(s) of this paper have knowledge of no significant technological changes the last 10 years. No further radical changes are expected in technologies used in the sector for felling, skidding or hauling. Specific options such as mono cable winching have been checked. The timber extraction practices applied have been unchanged in the last decade.

3.8 Additionality

Additionality is demonstrated using performance Method exceeding the region specific performance benchmark. This is done independently for each component of the project activity or categories: felling impacts, skidding impacts and hauling impacts. The methodological

requirements pertaining to demonstration of additionality are in conformance with the VCS standard as it requires projects to demonstrate additionality through both regulatory surplus and a performance benchmark. Section 7 of the methodology clearly states that project proponents must demonstrate regulatory surplus in accordance with the VCS standard. For the performance benchmark, the methodology appropriately requires that projects must exceed the region specific performance benchmark for each impact parameter (i.e. proxy factor), as outlined in the applicable RIL-C performance method. Impact parameters are defined for three categories, felling, skidding and hauling. Additionality is demonstrated for a given impact parameter if it is below the additonality benchmark defined for that impact parameter. The crediting baseline is based on mean values and the Additionality Benchmark is based on first quartile.

Additionality benchmarks have been set conservatively as demonstrated by the fact that all additionality benchmarks are below the bottom end of the 95% confidence interval and that only two of the nine concessions sampled in Griscom et al (2014) had mean values below the additionality benchmark. The fact that three of the nine sampled concessions were FSC certified further lends conservativeness to the benchmarks since 1/3 of the sample was represented by concessions which are already certified to be conducting good practice to some degree. Further, the methodology stipulates that projects can only be credited emission reductions if all impact parameters are at or below their respective crediting benchmarks. The process used to establish the performance benchmarks are adequately detailed in the methodology module and all data utilized is based on a satisfactory scientific study carried out (documents #5 &6). The auditors find that additionality is very stringent and the baseline is also conservative.

3.9 Quantification of GHG Emission Reductions and Removals

3.9.1 Baseline Emissions

The methodology takes a different approach than most existing AFOLU methodologies in that *ex post b*aseline emissions are not quantified separately from project emissions, but are rather addressed as part of a simultaneous analysis. As the methodology uses a performance benchmark method, this approach is feasible. Emissions reductions are calculated as a function of the difference between a given impact parameter, which serves as a proxy for emissions, and the corresponding crediting benchmark for that proxy variable in a given emissions source category. For example with the category of hauling emissions, impact parameters (for example, the area of haul roads) with associated crediting benchmarks is developed which represents the baseline scenario. An additionality benchmark is set conservatively lower than the crediting benchmark and the project scenario must demonstrate performance beyond this more conservative benchmark to be credited. The *ex post* performance in the given impact parameter in the project scenario as compared to the crediting benchmark, is used to calculate emissions reductions. The reduction of emissions is calculated by calculating the proportional reduction of biomass impacted (i.e. converted from biomass to emissions) by the given impact parameter (area of haul roads for example) in the project scenario as compared to the crediting benchmark. This proportional reduction in impact is then multiplied by the carbon stocks of the pool impacted. No equations, formulae, or default factors are identified in the methodology for the calculation of the baseline emissions. This is because i) emissions representing the baseline scenario are not

calculated independently from the project scenario and ii) the specific crediting and additionality benchmarks which in effect represent the baseline scenario, are developed at the level of the performance method module. As new performance method modules are developed these shall be evaluated through the VCS methodology approval process. Below is an evaluation of the first performance method module developed for Kalimantan.

As described above in the Baseline Scenario section of this report, the baseline scenario is represented by the crediting benchmark for each specific impact parameter identified in the methodology in general and in detail in the module. The impact parameters identified are those from hauling (*HAUL*), those from skidding (*SKID*), and those from felling (*FELL*). Each of these harvesting activities produces emissions beyond those represented by the merchantable biomass that is removed. The RIL-C methodology and module quantifies reduced emissions from improvements in the impact parameters due to implementation of reduced impact logging technologies and measures such as installation of cable systems rather than skid trails, etc. To establish additionality and crediting benchmarks in the module for each impact parameter the developer relies on published scientific literature assessing these impacts and associated emissions in the logging landscape. The additionality benchmarks for each impact parameter are defined as the first quartile value from the sample in Griscom et al (2014), rounded down to the nearest whole number. The appropriateness of this value is assessed in the Additionality section above. The crediting benchmark for each impact parameter represents the specific baseline scenario for that parameter and is defined as the grand mean value across sampled concessions from Griscom et al (2014). As described previously, for emissions reductions from any given impact parameter to be credited, that specific impact parameter shall be below (representing less emissions from non-merchantable biomass destroyed) the additionality benchmark and all other impact parameters shall be below the crediting benchmarks. This measure serves to ensure that projects are not credited for emissions reductions in one specific impact parameter while generating emissions in another impact parameter.

Table 2 of the module transparently summarizes the sampling results and the crediting benchmarks.

$FELL_{1B}$ was set at 25.1%, representing the grand mean proportion of logs abandoned at logging sites, due to improper felling techniques which damaged logs and/or failing to do testing plunge cuts for hollows in the logs.

$FELL_{2B}$ was set at 18.8%, representing the grand mean proportion of harvested log length abandoned.

$SKID_B$ was set at 19, representing the grand mean number of trees >20cm dbh destroyed per hectare by damage from equipment along skid trails.

$HAUL_B$ was set at 323.3m^2/ha, representing the mean area of haul roads and log landing corridors (in aggregate per hectare) observed across a subset of the sample in Griscom et al (2014). This benchmark was determined across a subset of five of the nine concessions used for

the full sample for the Griscom et al paper. The original versions of the methodology only quantified reductions in emissions associated with haul road width under the assumption that haul road length would be neither negatively or positively impacted by RIL-C measures. TNC and both methodology assessment teams had no reason to suspect this would not be the case. However, in the latter stages of the methodology assessment process, TNC observed in an initial trial usage of the methodology and RIL-C practices in an actual concession in East Kalimantan, that the desire of operates to reduce the emissions from the SKID parameter (by relying on cable logging systems) tended to result in longer haul roads being built. TNC appropriately alerted the audit team of this and used LiDAR to measure the actual area of Haul roads in five of the nine concessions, resulting in a new additionality baseline of 298.4m^2/ha (representing the 1st quartile measurement) and a new crediting baseline of 323.3m^2/ha (representing the mean). The audit team has determined that this sample is both more conservative and more accurate than the initial sample that the haul road widths were based upon. First, the dataset is much larger as the sample of area was measured via LiDAR, resulting in samples of haul road area across entire cutting blocks in the concessions rather than randomly allocated width measurements. Secondly, there is reason to believe this subset is more conservative than the entire nine concession sample as the mean haul road widths originally measured in this subset of five concessions is less than that in the remaining four concessions which were not resampled. This supports the assumption that haul road areas have been measured across the concessions which are "better actors" and hence that benchmarks are more conservative.

The module offers flexibility for some baseline default values used to estimate emissions reductions from $FELL_1$ and $FELL_2$. to be calculated at the level of the specific concession (project area) rather than to use the default values provided. These are assessed below:

Default values for $FELL_1$ and $FELL_2$:

FTB_t which represents the average felled tree biomass per ha, can be calculated independently using the following equation:

$$FTB_t = FTH_t * (((0.57* EXP(-1.499+(2.148*LN(FTD_t))+(0.207*(LN(FTD_t))^2)-(0.0281*(LN(FTD_t))^3))) + (0.489*((0.57* EXP(-1.499+(2.148*LN(FTD_t))+(0.207*(LN(FTD_t))^2)-(0.0281*(LN(FTD_t))^3))))^{0.89}) \div 2000)$$

Where:

FTH_t Average number of trees felled per ha with a chainsaw with the intent of commercial harvest (including those felled with no log extracted) (number)
FTD_t Average DBH of felled trees (cm)

The audit team confirms that application of the above equation is appropriate. The equation integrates field observations collected by the methodology user with a pantropical allometric equation for moist forest stands from Chave et al's (2005) *Tree allometry and improved*

estimation of carbon stocks and balance in tropical forests. This is one of the best regarded allometric equations for tropical application and has been used in several VCS projects and referenced in existing approved VCS AFOLU methodologies. The equation additionally integrates an appropriate root to shoot ratio from Mokany et al (2006), a VCS and IPCC referenced source for root to shoot ratios. The default wood density value used in the equation (0.57) was also used in the peer reviewed publication Griscom et al (2014) and is comparable to other mean values for wood density in tropical Asia, as confirmed by the audit team.

CDB_t which represents the mean collateral damage of biomass per ha from year t.

$$CDB_t = FTH_t * CDF_t$$

Where:

CDB_t Mean collateral damage biomass per ha from year *t* (t C/ha)
FTH_t Average number of trees felled per ha with a chainsaw with the intent of commercial harvest (including those felled with no log extracted) (number)
CDF_t Mean collateral damage biomass (t C) per felled tree is 1.74 t C/tree.

The audit team confirms the appropriateness of this equation. FTH_t simply represents the average number of trees felled in a given year and is easy for proponents to calculate. The value CDF_t (1.74tC/tree) is derived from the Griscom et al (2014) paper on which much of this module is based. The module clarifies that this is the bottom end of the 95% confidence interval among concessions sampled and that little variance was observed in this value, which is already conservative. As such the developer does not provide flexibility for this value to be updated which the audit team finds to be appropriate.

The final default value which proponents have the opportunity to update is FLB_t which represents mean felled tree log biomass per ha (representing the aggregate of all harvested portions of all logs per hectare), and is used to calculate emissions reductions from $FELL_{2.}$

$$FLB_t = FTH_t * ((0.099*FTD_t)-5.275)$$

The equation for FLB_t is based on the statistically significant linear relationship (R^2=0.9418, P<0.001) reported in Griscom et al (2014) between the average dbh of trees felled (FTD_t) and the actual aggregate mean harvested biomass per hectare. The audit team finds this equation to be appropriate as it is based on a statistically significant equation reported in published scientific literature.

The audit team has found the above equations for adjusting baseline default factors to be based on appropriate published data and to be without error.

3.9.2 Project Emissions

Ex ante estimation of project emissions/emissions reductions

This methodology differs from existing AFOLU methodologies in that there is no separate accounting of baseline and project emissions from which the reduction or removal of GHGs is quantified. The methodology rather relies on proportional improvements in impact parameters associated with forest management activities in order to derive emissions reductions at the time of verification. This difference is rooted in the fact that the annual volume of harvested timber is not reliably predictable prior to the year of harvest. However, to demonstrate conformance with VCS AFOLU Requirement 3.1.10, the developer has created *ex ante* emissions reductions procedures, as described in Section 8.2 of the methodology. These procedures involve estimation of the parameter *(At)* at validation, which is the anticipated annually harvested area for the 10 year baseline, based on project management operation documents. The proponent shall then make and justify conservative estimates of the level of effectiveness for interventions designed to improve each impact parameter corresponding to values < 1.0, and justified to auditor satisfaction based on specific planned operational procedures and/or infrastructure. The equations in Section 8.2 of the methodology are then used with these estimated values to develop *ex ante* emissions reductions estimates. The procedures as detailed are sufficient for this purpose and were developed with ongoing input of the VCS. Conformance has been demonstrated.

Ex post estimation of project emissions/emissions reductions

The procedures for calculating project emissions reductions are appropriate for the methodology. The methodology and module do not account for emissions removals as any increased growth rates from implementation of RIL-C measures is conservatively ignored.

Evaluation of the methodology:

Step 1: Determine harvest area

This step is appropriately implemented. The methodology requires that the harvest area be delineated on the basis of GIS shapefiles and/or paper maps specifying the annual harvest areas. Unstocked and inaccessible areas are appropriately removed from the delineation of the parameter *At.*

Step 2: Calculate emission reductions based on measured impact parameters

As described above, the methodology calculates emissions reductions based on improvement in certain impact parameters compared to the performance benchmarks representing the baseline. Impact parameters are categorized into emissions from felling, skidding, and hauling. Specific crediting and additionality benchmarks for each impact parameter shall be defined at the level of the module. The theoretical description in Step 2 of the methodology is sufficient in light of this.

Step 3: Sum emissions reductions

This step aggregates emissions reductions from improvements in each impact parameter (noting that to be credited, performance on all impact parameters shall be below the crediting benchmark) into an estimation of combined emissions reductions for both aboveground and belowground carbon in a given year. The equations provided are complete and appropriate, and complement the more specific calculations stipulated in the accompanying module.

Step 4: Determine emissions reductions by harvest area

All biomass from which emissions reductions are generated is converted from the live aboveground and belowground tree biomass pools to the dead wood pool in the baseline. Hence the total emissions reductions is the sum of the living pools multiplied by annual decomposition rates which have been appropriately selected for the aboveground and belowground pools in conformance with VCS AFOLU 4.5.3. The developer elects to provide methodology users with flexibility to choose an appropriate decay model for dead aboveground biomass or to use the 10 year linear decay function for the dead belowground biomass pool (both consistent with AFOLU 4.5.3 1). Both options are in conformance, and appropriate equations for implementing both options are included.

Evaluation of the module:

Section 5.1.1 of the module provides a sufficiently detailed overview of the process for quantifying emissions reductions. This section describes the basic linear equation form of the equations that follow in the module for calculating emissions reductions as:

ER= (baseline impact parameter – measured impact parameter) * (emissions coefficients).

This form of the equation matches the detailed equations provided later and is appropriate. The two coefficients described are the ratio for conversion from C to CO_2 which is correctly provided and consistent throughout subsequent equations. The additional coefficient provided is the fraction of above and belowground biomass (root to shoot ratio). As described elsewhere in this report the developer uses the appropriate root to shoot ratios from Mokany et al (2006) for tropical forest of high biomass which is an accurate description of forests in Kalimantan. The root to shoot parameter has been appropriately included in the data and parameters tables. Values for key defaults used in the equations throughout the module were conservatively identified by consistently using the value at the lower end or higher end of the 95% confidence intervals. These defaults include

-*FTB,* the average felled tree biomass per hectare (23.23 tC/ha),

-*CDB,* mean collateral damage of biomass per hectare (8.55 tC/ha)

-*FLB, average* felled tree log biomass per hectare representing the merchantable section removed (9.85tC/ha)

-*FB,* the forest biomass prior to haul road clearing, minus roundwood extracted (232.7 tC/ha)

Section 5.1.1 clearly provides the crediting benchmarks and additionality benchmarks to facilitate accurate comparison between baseline and project emissions.

Section 5.1.2 describes the procedures for quantifying emissions reductions in the project scenario for the parameter *FELL1,* representing reduction in the percent of felled trees abandoned. Equations 1 and 2 are used to calculate the emissions reductions in the project scenario from a reduction in the percent of felled trees abandoned for both aboveground and belowground pools. The equations follow the linear form described in Section 5.1.1, are user friendly, and would serve to quantify accurate emissions reductions.

Section 5.1.3 describes the procedures for quantifying emissions reductions in the project scenario for the parameter *FELL2,* representing reduction in the average percent of a harvested tree log length abandoned in the forest. Equations 3 and 4 are used to calculate the emissions reductions in the project scenario from a reduction in the percent of felled trees abandoned for both aboveground and belowground pools. The equations follow the linear form described in Section 5.1.1, are user friendly, and would serve to quantify accurate emissions reductions.

Section 5.1.4 describes the procedures for quantifying emissions reductions in the project scenario for the parameter *SKID,* representing reduction in the average number of trees greater than 20 cm DBH killed by skidding operations per hectare. Equations 5 and 6 are used to calculate the emissions reductions in the project scenario from a reduction in the percent of felled trees abandoned for both aboveground and belowground pools. The equations follow the linear form described in Section 5.1.1, are user friendly, and would serve to quantify accurate emissions reductions.

Section 5.1.5 describes the procedures for quantifying emissions reductions in the project scenario for the parameter *HAUL,* representing the mean area of haul road and log landing corridors per hectare used to extract timber. Equations 5 and 6 are used to calculate the emissions reductions in the project scenario from a reduction in the percent of felled trees abandoned for both aboveground and belowground pools. The equations follow the linear form described in Section 5.1.1, are user friendly, and would serve to quantify accurate emissions reductions.

The process of calculating emissions reductions and removals covers all GHG sources, sinks, and reservoirs included in the project boundary including aboveground tree biomass, belowground tree biomass, and dead wood. Emissions from non-CO2 GHGs are not included in the project boundary and hence are not accounted for in calculations.

The audit team has not identified any material errors in equations and formulae used in the calculation of project emissions and emissions reductions, with the exception of an observation identified in Section 8.4 of the methodology.

3.9.3 Leakage

Section 8.3 of the methodology, appropriately, does not include procedures for accounting for emissions from leakage. Reduced Impact Logging techniques do not typically involve a reduction in harvest levels, but rather the adoption of new technologies and measures which reduce the amount of damage and emissions per unit volume of timber extracted. The project activities do not involve the shifting of any economic or subsistence activity from the project area so there is no need to account for activity shifting leakage. Additionally, as RIL does not involve a reduction in harvest levels as part of the project activity the risk of market leakage is mitigated. The specific project activities outlined in future performance modules shall be assessed on a case by case basis by future module assessors to confirm that these modules do not involve RIL activities which would lead to a reduction in harvesting. The proponent has implemented applicability condition number 1 in section 4.1 of the methodology framework, requiring that the project activities do not involve a deliberate reduction in harvest levels, which bolsters this requirement. Specific criteria to demonstrate no intentional reduction in harvest area appropriately defined at the level of the module. The East Kalimantan module evaluated as part of this assessment specifies that projects shall demonstrate that harvests in annual cutting blocks in the project area do not fall below 16 m3/ha, a level conservatively identified as a minimum. This applicability condition, combined with the overall low risk of leakage is sufficient to demonstrate that the decision to not include leakage monitoring and measurement is in conformance.

3.9.4 Net GHG Emission Reductions and Removals

The procedures for calculating net GHG emissions reductions are described in detail in section 3.9.2 of this report, project emissions. The structure of the methodology does not involve a specific estimation of baseline emissions and a specific estimation of project emissions. Rather the difference between baseline and project scenarios is calculated as a proportional reduction in the identified impact parameters. Emission reductions are then quantified in the process of quantifying project emissions, and hence the net emission reduction calculation is inseparable from the project emissions calculation, which is reviewed above. The project activities would not promote activity shifting leakage since no activity is shifted from the project area, nor do they reduce the provision of timber resulting in no market leakage. As a result there is no need to calculate the net emissions reductions after deducting for leakage since leakage will not be quantified. The methodology requires via applicability condition 1 that harvesting does not reduce as a result of implementation of the project.

The audit team has reviewed all equations, formulas, and default factors and found them to be in conformance with the VCS requirements.

Section 5.1.4.1 of the module covers the equations for determining the additionality and crediting benchmarks for the Skidding Impact Parameter. Here it clearly states that the skidding impact parameter (SKID) is the number of trees greater than 10.0 cm DBH destroyed by skidding operations per hectare. Section 5.1.4.2 (Calculating Emissions Reductions) however, states; “The equations for estimating emissions reductions associated with reductions in *SKID* are based

on the empirical relationship (R^2=0.89) between mean field measurements for *SKID*, and mean field measurements of total committed emissions from destruction of trees > 10 cm DBH in each of the concessions sampled by Griscom *et al.* (2014)…" The auditors question the reference to the 10 cm DBH threshold cited in this section and if this value is an error and is intended to be 20 cm DBH. As a result of this apparent error, an Observation has been raised.

3.10 Monitoring

The monitoring component of the methodology and related purposes is described in section 9 of the methodology. All impact parameters from all logging emission source categories (felling, skidding and hauling), as identified in the module are to be monitored. Detailed monitoring procedures for each impact parameter are outlined in section 5.2 of the module. The applicable data and parameters to be reported, including the sources of data and units of measurement have been identified. See specific findings or individual data parameters to be monitored below.

Throughout the methodology framework, with respect to monitoring frequency, the Developer has changed the description of the monitoring frequency to read; "Throughout the project crediting period, monitoring must be conducted within five years after each harvest unless otherwise specified in the applicable geographic-specific performance method module. Monitoring shall not be conducted more frequently than once per year." This added text clarifies the issue and provides reasonable requirements which are further adapted appropriately at the level of the module.

In the East Kalimantan performance meth module (section 5.2), the Developer has added the following requirement with respect to monitoring frequency; "monitoring must be conducted within two years after each harvest." The Developer asserts that this requirement was added to reflect the transient nature of the impact parameters used. The monitoring tables, section 6.2 – Data and Parameters Monitored (frequency of monitoring/recording line) have also been updated with "Within two years after each annual harvest."

This requirement is in accord with the new methodology framework requirement and addresses concerns that the audit team has expressed about the rapid rate of decomposition in East Kalimantan and ensuring that evidence of damaged trees, etc. necessary for corroboration of carbon accounting by future audit teams will be preserved.

The auditors note that the parameter tables in section 9 of the methodology framework and section 6 of the module do not utilize the most current version of the VCS parameter table format and that data and parameters are not separated into those available at validation and those monitored for the module. The developer has also received and provided evidence to the audit team, of a waiver from the VCS from 26 November 2013 permitting them to continue to use an older version of the parameter and data tables.

Under some of the data and parameters available at validation in the methodology framework (f_{BGB} *(SKID$_t$),* f_{AGC} *(HAUL$_t$),* f_{BGB} *(HAUL$_t$))*, the description of the data unit/parameter states; "Equation estimating savings factor for emissions from…" The meaning behind the words "saving factor" in these statements is not quite clear, and the auditors question whether the intent for these statements is to simply be "Equation estimating emissions reductions from…" The same words (savings factor) also appear next to the parameter $ER_{fell\_AGC,t}$ in section 8.2, step 2 of the methodology framework. As a result an Observation has been raised.

Detailed procedures for monitoring impact parameters have been provided in Section 5.2 of the module. Table 5.2 identifies appropriate sample size requirements for impact parameters that shall be monitored. These sample sizes are based upon the published work of Griscom et al (2014) and demonstrates conformance with VCS Standard 4.5.6 as an appropriate data source for development of performance methods.

Section 5.2.1 describes the process for monitoring both *FELL1* and *FELL2. FELL1t* is monitored via random or systematic sampling, or censusing, of >200 felled trees within areas accessed by skid trail sections sampled for monitoring the parameter *SKID*. *FELL1t* is the number of felled trees from which no discernible volume has been extracted divided by the total quantity of felled trees (harvested plus abandoned trees). This approach is appropriate. *FELL2t* is monitored by visual assessment of the proportion of harvested tree log length abandoned, and is derived from the same sample as *FELL1t*, represented by all trees sampled for *FELL1t* which have had some portion of the bole harvested. The specific sampling approach shall be evaluated by auditors at the project level, which is acceptable.

Section 5.2.2 describes the process of measuring the parameter *SKIDt*. This parameter is determined through a count of all trees greater than 20cm DBH which have been destroyed (killed) within a 50m buffer from the sampled skid trail network or 75m of a long line winch system skidding anchorpoints. This sampling map is developed through random selection of a skid trail start point, and subsequent tracking of that entire skid trail network. Subsequently, all trees killed within the buffer zone surrounding the network are tallied, and a per hectare estimate is developed.

Section 5.2.3 describes the process of measuring the parameter *Hault.* This impact parameter is measured using either GIS maps or remote sensing imagery (minimum 30m resolution). Haul road areas must be measured via systematic or random sampling with a minimum sample size of 25 widths measured. Widths shall be measured via field surveys or via high resolution imagery (with a maximum resolution of 2m). The approach described is appropriate, and in conformance.

Data and Parameters available at Validation in the Methodology Framework:

Data and Parameters	Auditor findings
f_{AGC} $(FELL_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from aboveground biomass resulting from felling at year t $(ER_{fell\_AGC,t})$ as a function of felling impacts measured in year *t* $(FELL_t)$.
f_{BGB} $(FELL_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from belowground biomass resulting from felling at year t $(ER_{fell\_BGB,t})$ as a function of felling impacts measured in year *t* $(FELL_t)$.
f_{AGC} $(SKID_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from aboveground biomass resulting from skidding at year t $(ER_{skid\_AGC,t})$ as a function of skidding impacts measured in year *t* $(SKID_t)$.
f_{BGB} $(SKID_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from belowground biomass resulting from skidding at year t $(ER_{skid\_BGB,t})$ as a function of skidding impacts measured in year *t* $(SKID_t)$.
f_{AGC} $(HAUL_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from aboveground biomass resulting from hauling at year t $(ER_{haul\_AGC,t})$ as a function of hauling impacts measured in year *t* $(HAUL_t)$.
f_{BGB} $(HAUL_t)$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it is related to estimations of emission reductions from belowground biomass resulting from hauling at year t $(ER_{haul\_BGB,t})$ as a function of hauling impacts measured in year *t* $(HAUL_t)$.
K	The developer has specified that values (in %/yr) from the scientific literature shall be used for the dead wood annual decomposition rate, and that the rate used shall be derived from a similar climate regime and forest type as the project area. The developer has appropriately clarified that the rate shall be evaluated at the level of the project rather than at the level of modules which are developed. Additionally, the developer has allowed methodology users to select the 10 year linear decay function specified in VCS AFOLU 4.5.3, which is in conformance with the VCS requirements. Valid equations for implementing both options have been provided.

Data and Parameters Monitored in the Methodology Framework:

Data and Parameters	Auditor findings
A_t.	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the actual area harvested in year t. This parameter appropriately excludes any un-stocked areas or areas where skidding or hauling would be infeasible (e.g. due to geographic features). The actual area harvested in year t is a key parameter for quantifying overall emission reductions and QA/QC procedures are specified, which include the need for imagery and datasets that are used to be geo-registered referencing boundary corners, land features or other intersection points.
$FELL_t$	The auditors find this to be an appropriate data/parameter to be monitored as it is a key parameter affected by RIL-C project activities. Monitoring procedures for felling impact parameters are adequately detailed in the methodology module and include both $FELL1_t$ (percentage of felled trees abandoned in annual harvest block from year t) and $FELL2_t$ (average percentage of felled log length left in the forest from trees felled and harvested (with some volume extracted) in annual harvest block from year t).
$SKID_t$	The auditors find this to be an appropriate data/parameter to be monitored as it is a key parameter affected by RIL-C project activities. Monitoring procedures for skidding impact parameters are adequately detailed in the methodology module and include two component parameters; $SKID_{dens,t}$ (average meters length of skid trails per hectare in annual harvest block from year t) and $SKID_{dam,t}$ (average number of trees greater or equal to 20 cm DBH snapped or uprooted per meter skid trail in annual harvest block from year t).
$HAUL_t$	The auditors find this to be an appropriate data/parameter to be monitored as it is a key parameter affected by RIL-C project activities. Monitoring procedures for hauling impact parameters are adequately detailed in the methodology module. The hauling impact parameter includes log landings which are treated as an extension of the haul road network.
$ER_{fell\_AGC,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from aboveground biomass resulting from felling in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring

	is to take place at the completion of annual harvests.
$ER_{skid\_AGC,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from aboveground biomass resulting from skidding in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.
$ER_{haul\_AGC,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from aboveground biomass resulting from hauling in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests. No data/parameter included for emission reductions from belowground biomass resulting from hauling in year t appears to be included and as a result a non-conformance has been raised.
$ERf_{ell\_BGB,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from belowground biomass resulting from felling in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.
$ER_{skid\_BGB,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from belowground biomass resulting from skidding in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.
$RILC_{,AGC,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from aboveground biomass resulting from RIL-C project activities in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.
$RILC_{,BGB,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimations of emission reductions from belowground biomass resulting from RIL-C project activities in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.

$C_{RIL,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to estimation of the total emission reductions achieved from RIL-C project activities in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.
ER_T	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the net GHG emission reductions achieved from RIL-C project activities in year t. Procedures for the assessment of this parameter are covered in the module, and monitoring is to take place at the completion of annual harvests.

Data and Parameters Available at Validation:

Data and Parameters	Auditor findings
R	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the ratio of CO_2 to C molecular weight. This ration is correctly identified as 44/12 (=3.67)
FTB	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents felled tree biomass carbon in units of t C/ha. Justification for use of the fixed default value of 23.23 is provided, and is based on the primary study used for the development of this methodology (Griscom et al 2014). This parameter can also be calculated as outlined in section 5.2.1 of the performance module.
CDB	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents collateral damage biomass carbon in units of t C/ha. Justification for use of the fixed default value of 8.55 is provided and is based on the primary study used for the development of this methodology (Griscom et al 2014). This parameter can also be calculated as outlined in section 5.2.1 of the performance module.
FLB	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the mean felled tree log biomass carbon (excluding trees with no log section removed) in units of t C/ha. Justification for use of the fixed default value of 9.85 is provided and is based on the primary study used for the development of this methodology (Griscom et al 2014). This parameter can also be

	calculated as outlined in section 5.2.1 of the performance module.
F_{AGB}	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the fraction of total tree biomass carbon that is aboveground (fixed value of 0.81). This dimensionless parameter is based on what the auditors consider an appropriate data source (Mokaney et al 2006).
F_{BGB}	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the fraction of total tree biomass carbon that is belowground (fixed value of 0.19). This dimensionless parameter is based on what the auditors consider an appropriate data source (Mokaney et al 2006).
0.0001	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the conversion from square meters to hectares (0.0001).
FB	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the estimate of forest biomass carbon prior to haul road clearing, minus roundwood extracted in units of t C/ha. Justification for use of the fixed default value of 232.7 is provided and is based on the primary study used for the development of this methodology (Griscom et al 2014).
$HAUL_B$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the number of square meters per hectare of cutting block (m^2ha^{-1}), based on table 2 in section 5.1.1 of the performance module.
SEC	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the skidding carbon emissions coefficient, with a fixed value of 0.5249, as derived in section 5.1.4.2 of the performance module.
$SKID_B$	The auditors find this to be an appropriate data/parameter to be available at the time of project validation as it represents the baseline value for skidding impact parameter – mean number of trees > 20 cm DBH destroyed per hectare; with a fixed value of 19.0 (trees/ha) based on table 2 in section 5.1.1 od the performance module.

Data and Parameters to be monitored from the Performance module:

Data and Parameters	Auditor findings
$FELL1_t$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the felling impact parameter an estimations of emission reductions from the percent of intentionally felled trees abandoned in the annual harvest block at year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed, with QA/QC procedures specified.
$FELL2_t$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the felling impact parameter an estimations of emission reductions from the average percent felled log length extracted in the annual harvest block at year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed, with QA/QC procedures specified.
$SKID_{dens,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the skidding impact parameter and estimations of emission reductions from the density component (average meters length of skid trails per hectare in annual harvest block at year t). Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed. This parameter is calculated, with no QA/QC procedures being necessary.
$SKID_{dam,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the skidding impact parameter and estimations of emission reductions from the damage component (average number of trees greater or equal to 20 cm DBH damaged per meters skid trail in annual harvest block at year t). Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed. This parameter is calculated, with no QA/QC procedures being necessary.
$L_{SKIDi,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the skidding impact parameter and estimations of emission reductions from the length of the skid trail network (i) in annual harvest block from year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed with QA/QC procedures specified.

$A_{SKIDi,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the skidding impact parameter and estimations of emission reductions from the area of the skid trail network (i) in annual harvest block from year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed with QA/QC procedures specified.
$Tree_{dam,t,i,j}$	The auditors find this to be an appropriate data/parameter to be monitored as it is related to the skidding impact parameter and estimations of emission reductions from the number of damaged trees greater or equal to 20 cm DBH damaged by skidding that are tallied along skid trail network (i) in annual harvest block at year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed with QA/QC procedures specified.
$Skid_{,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it represents the skidding impact and estimations of emission reductions from the number of damaged trees greater or equal to 20 cm DBH damaged in skid trails per hectare in annual harvest block at year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed. This parameter is calculated, with no QA/QC procedures being necessary.
FTH_t	The auditors find this to be an appropriate data/parameter to be monitored as it represents the felled tree density and estimations of emission reductions from the number of felled trees (both abandoned and harvested) in annual harvest block at year t. This parameter is appropriately derived from the same tally used to monitor $FELL1_t$ and the harvest area used for monitoring of this parameter is a subset of $A_{SKIDi,t}$ from the skid trail networks sampled for $FELL1_t$. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed with QA/QC procedures specified.
FTD_t	The auditors find this to be an appropriate data/parameter to be monitored as it represents the felled tree density and estimations of emission reductions from the average DBH of felled trees in annual harvest block at year t. This parameter is derived appropriately from the average diameter of felled trees from the 100% commercial timber inventories of annual cutting areas conducted by commercial logging concession holders.

$Haul_{M,t}$	The auditors find this to be an appropriate data/parameter to be monitored as it represents the average area of cleared haul road corridors inclusive of log landings, accessing annual harvest block at year t. Sampling procedures for this parameter to be implemented within two years after each annual harvest were found to be adequately detailed with QA/QC procedures specified.

With the exception of the NCRs noted above, the monitoring plan requirements of the methodology was found to be in conformance with the VCS Standard requirements. Monitoring is t take place at the completion of annual harvest, and the data/parameters that are required to be monitored address all impact parameters from the three applicable emission source categories (felling, skidding, and hauling) that are applicable to this methodology and related performance method module. Sampling procedures are adequately detailed and QA/QC procedures are specified as appropriate.

4 ASSESSMENT CONCLUSION

Seventeen NCRs were raised during the second assessment of this methodology by Rainforest Alliance. The NCRs identified were mandatory for the successful assessment of the methodology. Multiple iterations of the methodology framework and the module were submitted to Rainforest Alliance prior to demonstration of conformance with the VCS requirements and closure of all NCRs.

Based on the updated methodology framework and performance module documents provided for auditor review, it was determined that this methodology is in full conformance with the VCS Standards. All 17 NCRs were closed with satisfactory evidence. Nine OBSs remain open but this does not pose an obstacle to approval of the methodology as OBSs are non-binding nonmaterial findings. The final approved methodological documents are the VM0035 Methodology for Improved Forest Management Through Reduced Impact Logging (RIL-C), version 3.1, 7 December 2015 and VMD0047 Performance Method for Reduced Impact Logging in East and North Kalimantan, version 3.1, 7 December, 2015.

5 REPORT RECONCILIATION

The report reconciliation process resulted in minor changes to the report. Following finalization of Rainforest Alliance's report on 18 October 2015 the report and updated methodology were submitted to Environmental Services Inc. (ESI) the first assessor of the methodology for reconciliation. ESI felt that a change in the methodology text that had occurred subsequent to their methodology approval, dealing with an applicability condition was inappropriate. Applicability Condition #6 requiring that RIL-C projects cannot increase business as usual levels of impact to dead wood stocks had been removed as an applicability condition and restated as a project activity definition by TNC which RA had approved. ESI felt it was important that it be

reinstated as an applicability condition, which has occurred. All parties including TNC, VCS, ESI and Rainforest Alliance have come to agreement and approval of the final version of the methodology (V3.1, issued 7 December 2015) and the performance method module (V3.1, issued 7 December 2015) as of 10 December 2015. The methodology and performance method module are approved by Rainforest Alliance for usage in the VCS program.

6 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

Rainforest Alliance is accredited by the American Standards Institute against USO 14065:2007, and is qualified to perform validation and verification of GHG emission reductions and removals of projects under the Land Us and Forestry sector. For the second assessment of this methodology, Rainforest Alliance utilized a VCS approved Standardized Methods Expert, *Luis de la Torre Vivar.*

Describe how the validation/verification body fulfils the eligibility requirements for validation/ verification bodies set out in the VCS Methodology Approval Process, providing appropriate evidence where required.

7 SIGNATURE

Signed for and on behalf of:

Name of entity: Rainforest Alliance_____

Signature: 

Name of signatory: Campbell Moore_____

Date: 4 January 2016_____

APPENDIX A: NONCONFORAMNCES (NCRS) AND OBSERVATIONS (OBS)

NCR#:	01/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principles of Consistency, Accuracy and Transparency
Report Section:	Section 3.3
Description of Non-conformance and Related Evidence:	
Section 8.2, step 1 of the methodology framework states that; "The harvest area in year t should be delineated on the basis of paper maps or GIS files specifying the authorized harvest area in year t." The auditors raised the point that the term "authorized area" may not be the same as the "actual area" that is harvested. This was discussed with the developers and they indicated that the term "actual area" is more appropriate to be used for the determination of the harvest area in the methodology.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	In the Developer's response to this NCR (document 1a) the developers indicate that they have revised the term "authorized area" used in the methodology framework to the term "actual area" for the determination of the harvest area in the methodology. Auditor review of the updated methodology framework (document 2a), section 8.2, step 1, confirmed that with respect to determining the harvest area (to produce *parameter* A_t) the term "authorized area" has indeed been replaced with the term "actual area." Further clarification has also been added indicating that to determine the harvest area (to produce *parameter* A_t) from the "actual area" projects are to delineate and exclude any area where timber harvest

	impacts will not happen for any reason (e.g. due to geographic features, low stocking, set asides, or poor planning. In section 9.2 of the methodology framework, the description of Parameter A_t has also been revised to clearly indicate that this parameter is the area of actual harvest area in year t, with clarifying language that this area may be smaller than the authorized area of harve4st due to un-stocked areas or areas where timber harvest and skidding area infeasible (e.g. due to geographic features or areas set aside from logging activity). The auditors consider the use of the term "actual area" and associated clarification language as described above for determining the harvest area (to produce *parameter* A_t) is more appropriate than the previous use of "authorized area." Therefore this nonconformance is considered closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	02/15
Standard & Requirement:	VCS AFOLU Requirements, section 4.6.14
Report Section:	Section 3.5
Description of Non-conformance and Related Evidence:	
As described to the auditors, this applicability condition was included to simplify application of the methodology, exclude the possibility of significant leakage (no leakage), and also allows for the exclusion of the harvested wood products pool (inputs into harvest wood remain the same). Neither the methodology framework or the module define the historic time period that would need to be considered to demonstrate that a project does not involve deliberate reductions in harvest levels, and as a result it is not clear how adherence to this applicability condition would be verified.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation

Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	Section 4.1 of the methodology framework has been revised to clarify that the specific criteria to demonstrate no intentional reduction in harvest levels are provided by the applicable RIL-C performance method module. The approach of devolving the creation of applicability criteria to prevent leakage from occurring to the level of performance method modules is in conformance with the VCS principles as this is more accurate than attempting to create overarching quantifiable methods for demonstrating no reduction in harvest across the potentially global scale of future module locations. The performance method module for East Kalimantan now clearly stipulates in Applicability Condition 3, that projects must demonstrate that the average harvest intensity within annual cutting blocks does not fall below 16 m^3/ha, considered to be the level below which a deliberate reduction in harvest intensity is assumed. This is based on the harvest intensity, one standard deviation below the mean harvest intensity in the sample that the Griscom et al 2014 paper and the performance benchmarks are based upon. This approach is an appropriate means of mitigating any risk that RIL-C projects could attempt to generate credits by simply harvesting less timber and also serves to ensure that concessions applying the module are comparable to those the performance benchmarks are based upon.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	03/15
Standard & Requirement:	VCS AFOLU Requirements, section 4.3.14
Report Section:	Section 3.5
Description of Non-conformance and Related Evidence:	

The applicability condition is unclear as to whether it shall be conformed to at the level of future modules developed or at the level of projects that are developed. It is unclear whether the developer intends for a module developer to demonstrate that the RIL-C measures implemented in a new module would not result in impacts to dead wood stocks, or whether the developed intends that future project developers shall demonstrate to the auditors that deadwood stocks have actually been un-impacted by RIL-C measures implemented. This lack of clarity has resulted in a non-conformance.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The developer has removed the applicability condition entirely and provided explanation for its removal. The audit team does not see the applicability condition as necessary for accurate or conservative quantification of GHG reductions and/or removals. In combination with removing the applicability condition the proponent has further clarified the definition of RIL-C practices in Section 3 “Definitions” of the methodology framework, to specify that RIL-C practices do not include slash management, salvage harvesting or other planned removal of dead wood. The audit team agrees both i) that this clearer definition resolves the need to include the original applicability condition and ii) that as reduced impact logging seeks to minimize damage to living (not dead) vegetation, this requirement was actually incidental to and unrelated to reduced impact logging and was superfluous. It is true that reduced impact logging techniques aiming to minimize damage to living vegetation could have an impact on dead wood stocks. However, in this case the audit team agrees that any impact to dead wood stocks that are pre-existing before the project start date would be conservative. For example, as the RIL-C practices lead to construction of less hauling roads, damage to standing dead wood can be expected to be less with RIL-C practices. The project scenario does reduce the baseline expected stocks of dead wood (from slash), however, this is by maintaining that baseline slash as actual

	living tree vegetation through less impactful forest management procedures, and this is exactly where much of the credits are generated, and appropriate carbon accounting procedures are in place. In summary, the corrective actions taken by the Developer simplify the methodology by removing what was an unnecessary requirement, and the updated definition of RIL-C practices will ensure that any future performance method modules developed are in conformance with the methodology framework. The nonconformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	04/15
Standard & Requirement:	VCS Standard, section 4.3.1
Report Section:	Section 3.5
Description of Non-conformance and Related Evidence:	
As discussed with the developers, the intent behind this applicability condition is to ensure that the IFM project and related RIL-C harvest activities are legally permissible. The auditors determined this applicability condition to be appropriate and consistent with section 4.4.4, item 2) of the VCS AFOLU requirements that stipulate the need to adhere to the legal requirements of forest management and land use in the area (unless verifiable evidence is provided demonstrating that common practice in the area does not adhere to such requirements). The auditors however question whether this applicability condition is intended to prevent certain types of situations and/or concessions from being eligible to use this methodology. For example, it is not clear if a project applying this methodology with a crediting period of 50 years, and a concession period of 25 years - with the option for renewable would be considered eligible.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation

Evidence Provided by Organization:	Documents 1a, 2a, 11a, 12a
Findings for Evaluation of Evidence:	To address this NCR the Developers have revised this applicability condition (project-specific applicability condition 3) in the methodology framework to state; "In every year credited, the project proponent must hold legal authorization, for all logging activities referenced in the project, from the relevant government authority." The auditors find this revision to project-specific applicability condition 3 in the methodology framework to be appropriate. The change to this applicability condition that requires the Project Proponent to hold legal authorization, for all logging activities referenced in the project, from the relevant government authority, *in every year credited* addresses the initial concern that the original applicability condition would prevent certain types of situations and/or concessions from being eligible from using this methodology, when this was not the specific intent by the developers. As communicated by the Developers, the intent behind this applicability condition is to ensure that the IFM project and related RIL-C harvest activities are legally permissible, and the auditors find the revised applicability condition to fulfil this intent. Therefore this nonconformance is closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	05/15
Standard & Requirement:	VCS Standard, Section 4.1.16
Report Section:	Section 3.5
Description of Non-conformance and Related Evidence:	

This performance method applicability condition and requirement to quantify and discount uncertainty in the dependent variable (emission reductions) was found to be appropriate. It is clear that any new region-specific performance methods that may be developed will need to establish relationships between impact parameters and emission reductions for the carbon pools affected by the project activities, including aboveground and belowground tree biomass under each emission category (logging, felling and hauling). Consistent with the requirements of the VCS standard section 4.8, the units of measurement for the impact parameters have been defined and are identified as t CO2/ha. The VCS Standard, section 4.1.16 however requires units to be in t CO2e	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 11a, 12a
Findings for Evaluation of Evidence:	In response to this NCR the Developers have revised the units of t CO2 that had been used in the methodological equations to correctly be in units of t CO2e as required by the VCS Standard. This nonconformance is therefore considered closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	06/15
Standard & Requirement:	VCS AFOLU Requirements, section 4.3.1
Report Section:	Section 3.6
Description of Non-conformance and Related Evidence:	

According to Table 2, in section 4.3.1 of the VCS AFOLU Requirements, the inclusion of this pool is optional, and may be excluded from the project boundary. The developer has elected to include this pool, and asserts that this pool must be included as it represents a significant pool affected by the project activity. The auditors concur. As stated in the VCS AFOLU Requirements, for optional pools, "where the pool is included in the methodology, the methodology shall establish criteria and procedures to set out when a project proponent shall or may include the pool." The methodology however, does not appear to have established criteria and procedures to set out when a project proponent shall or may include this pool.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 11a, 12a
Findings for Evaluation of Evidence:	Belowground biomass remains as a carbon pool included in the project and baseline scenario, as outlined in table 1, of section 5 of the methodology framework. The justification/explanation for the inclusion of this pool has however been expanded to state; "Must be included in all cases – represents a significant pool affected by the project activity." The Developer's asserts their position that for VCS AFOLU methodologies, the methodologies may be more stringent than the methodological guidance, and that by requiring this pool "in all cases" they have essentially set a criterion for when projects shall or may include the pool. In this case, they are explicitly requiring the inclusion of the belowground biomass pool, and that this pool is not being treated as an optional pool in the methodology. The auditors concur with these assertions made by the Developers. The expanded justification/explanation for the mandatory inclusion of this pool in the project and baseline scenario (*Must be included in all cases*) was found to be appropriate to the auditors and addressed the concerns that resulted in this NCR being raised. This nonconformance is therefore considered closed.
NCR Status:	CLOSED

Comments (optional):	None

NCR#:	07/15
Standard & Requirement:	VCS AFOLU 4.5.3
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
The developer has specified in the methodology that values (in %/yr) from the scientific literature shall be used for the dead wood annual decomposition rate, and that the rate used shall be derived from a similar climate regime and forest type as the project area. However, the developer does not clarify whether this is a parameter that shall be selected at the level of performance module development or at the level of project development. No further guidance is provided on this in the module. The audit team also notes that the VCS AFOLU Requirements 4.5.3 allow the flexibility to use a 10 year linear decay function rather than a value derived from the literature.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The developer has clearly described in Section 9.1 of the methodology framework that the parameter *K* shall be justified and applied at the individual project level using equation 9a, rather than at the level of the performance module. This approach will lead to more accurate results than defining this as the level of the performance method module. The developer has appropriately clarified in Section 8.2, Step 4 of the module that a 10 year linear decay function can be used if a valid dead wood annual decomposition rate cannot be found for the site in the literature. This has been added in the form of equation 9b of the module.

	The nonconformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	08/15
Standard & Requirement:	VCS Methodology Template v3.3 Section 9.1; VCS Methodology Module Template Section 6.1
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
The developer has not separated the data and parameters sections of the performance method module into "data and parameters available at validation" and "data and parameters monitored" as required. Some default factors identified in the text of the module are not represented in the data and parameters tables of either the methodology or the module including: 1. *R,* the ratio for converting C to CO2 (*R*). 2. *FTB,* the felled tree biomass default value of 23.23. Note also that this value is referred to as "biomass" yet it is measured in tC/ha which creates confusion regarding whether this is dry biomass or carbon. 3. *CDB,* the collateral damage of biomass, 8.55tC/ha. This value also is referred to as "biomass" yet is measured in tC/ha which creates confusion regarding whether this is dry biomass or carbon. 4. F_{AGB} which is the fraction of total tree biomass that is aboveground, 0.765, derived from Mokaney et al. 5. F_{BGB} which is the fraction of total tree biomass that is belowground, 0.235, derived from Mokaney et al. 6. 0.0001, which represents the conversion from m2 to ha. 7. *FB,* which represents the estimate of forest biomass prior to haul road clearing, minus roundwood extracted. 8. $HAUL_B$ representing the baseline value for the Hauling Impact Parameter in the module (35m) 9. $HAUL_M$ representing the monitored value for the Hauling Impact Parameter 10. *HRL* representing the default value for the haul road length per ha of cutting block 11. *SEC,* representing the skidding carbon emissions coefficient, 0.5249 12. $SKID_B$ representing the baseline value for skidding impact parameter 13. $ER_{haul\_BGB,t}$ The VCS methodology module template requires in Section 6.1 and VCS methodology template Section 9.1 requires that "all data and	

parameters used in equations in the module are included in this section". These parameters and accompanying information are missing from the module. The developer also does not use the most recent version of the data and parameters tables available from the VCS which is not in conformance.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The proponent has reorganized Section 6.1 of the module such that it is now appropriately organized into (Section 6.1) data and parameters available at validation and data and (Section 6.2) data and parameters monitored, as required by the VCS Methodology Module Template. Additionally, tables have been added for the following parameters: 1. *R,* the ratio for converting C to CO2 (*R*). 2. *FTB,* the felled tree biomass default value of 23.23. Note also that this value is referred to as "biomass" yet it is measured in tC/ha which creates confusion regarding whether this is dry biomass or carbon. 3. *CDB,* the collateral damage of biomass, 8.55tC/ha. This value also is referred to as "biomass" yet is measured in tC/ha which creates confusion regarding whether this is dry biomass or carbon. 4. F_{AGB} which is the fraction of total tree biomass that is aboveground, 0.81, derived from Mokaney et al. 5. F_{BGB} which is the fraction of total tree biomass that is belowground, 0.19, derived from Mokaney et al. 6. 0.0001, which represents the conversion from m2 to ha. 7. *FB,* which represents the estimate of forest biomass prior to haul road clearing, minus roundwood extracted.

	8. $HAUL_B$ representing the baseline value for the Hauling Impact Parameter in the module (35m) 11. *SEC,* representing the skidding carbon emissions coefficient, 0.5249 12. $SKID_B$ representing the baseline value for skidding impact parameter 13. $ER_{haul\_BGB,t}$ 14. *FLB* The developer has correctly included the missing parameter information in the data and parameters tables. The developer has also received and provided evidence to the audit team, of a waiver from the VCS from 26 November 2013 permitting them to continue to use an older version of the parameter and data tables. Conformance has been demonstrated and this nonconformance is closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	09/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principle of Completeness
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
The parameter $SKID_{B,}$ which represents the baseline value for the skidding impact parameter, has no default or baseline value provided. The audit team assumes that this baseline value shall be set at the average number of trees > 20 cm which are destroyed from skidding per hectare.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence

	above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 11a, 12a
Findings for Evaluation of Evidence:	In response to this NCR, the Developer has indicated that the baseline default value (19.0) for $SKID_{B,}$ as derived in Table 2, has been added to the parameter description for equations 5 & 6 as well as the parameter table for $SKID_{B.}$ Further, Table 2 was also revised to specify that the impact parameter is $SKID_B$ not $SKID_.$ Auditor review of the updated Performance Module, section 5.1.4.2 confirmed that the default value for $SKID_B$ (19.0) has indeed been added to the parameter descriptions for equations 5 & 6. Parameter $SKID_{B,}$ included in the Data and Parameters Available at Validation section (6.1), also was confirmed to identify the default value, with the following description; "Baseline value for skidding impact parameter – mean number of trees > 20 cm DBH destroyed per ha; fixed value of 19.0." The default value of 19.0 representing the mean baseline value for the skidding impact parameter (Crediting Baseline) was found to be correctly calculated in Table 2, section 5.1.1 of the performance module. The addition of the default value for $SKID_B$ in these sections of the performance module address the concerns that resulted in this NCR being raised. Therefore the NCR is closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	10/15
Standard & Requirement:	VCS Methodology Template v3.3 Section 9.1; VCS Methodology Module Template Section 6.1
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	

The auditors note a missing reference. Equation 9 in module refers to "the Chave equation" but no reference is provided.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The audit team has confirmed that the correct full reference for the Chave et al 2005 equation has been added as "Chave, J., Andalo, C., Brown, S. 2005. Tree allometry and improved estimation of carbon stocks and balance in tropical forests." *Oecologia* 145: 87–99." Conformance has been demonstrated and this non-conformance is closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	11/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principle of Accuracy
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	

Several examples exist in the module in which the developer refers to a particular parameter as "biomass", yet the units provided are in tons of carbon. This inconsistency creates general confusion as to whether the value for the parameter in question actually represents tons of carbon or tons of dry matter, as biomass is typically expressed. Examples include the parameters *FTB, CDB,* $F_{AGB,}$ $F_{BGB,}$ $CDF_{t,}$ $FTH_{t,}$ *FB.*	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The developer has edited the methodology framework and performance module such that it now consistently describes all elements measured in carbon (C) as "biomass carbon". The corrective action taken is sufficient to close the nonconformance.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	12/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principle of Consistency
Report Section:	Section 3.9
Description of Non-conformance and Related Evidence:	

Some examples of inconsistent use of terminology have been identified which represent a material risk of confusion by methodology users, including:

1. The developer uses the words “baseline”, “crediting baseline”, and “crediting benchmark” interchangeably throughout the module which creates confusion and uncertainty, and may lead to errors by the user. The confusion is exacerbated by the fact that the methodology is consistent and precise in its usage of these different terms, with “baseline” referring to the broader concept of a baseline and “crediting benchmark” referring to the specific measurable crediting benchmark.

2. The developer in the methodology Section 8.4 states that “Net GHG emission reductions are calculated by subtracting leakage from emissions reductions, as follows”, however the following equation does not include leakage. It is appropriate to not include leakage but the inaccurate description of the equation is inconsistent and may cause confusion for users.

3. The module describes dead trees killed by skidding equipment as actually having experienced mortality in some cases and in other cases as “damaged”. “Damage” does not specifically imply mortality to the audit team. Conversations with the developer have clarified that the intent is to describe trees that have actually been killed rather than just injured but alive, however methodology users are likely to be confused by this.

4. The term “Abandoned Felled Tree” is a specific definition identified in section 3.1 of the module. Section 5.2.1 of the module however in a couple of cases refers to the term “intentionally felled trees abandoned.” Use of the term ‘intentionally here could cause confusion given that the term abandoned felled trees is a specific definition outlined in section 3.1 and the term intentionally is implied in the definition of felled trees.

Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a

Findings for Evaluation of Evidence:	In response to this NCR, the Developers have revised the inconsistent terminology throughout the methodology framework and performance module that was found to cause be confusing to the auditors. Changes to the following terms were confirmed to have been made throughout the methodology documents. 1. The term “crediting baseline” which serves as the baseline in accounting, is now consistently used throughout the methodology framework and performance module and has replaced the terms “baseline” and “crediting benchmark” which had previously been used interchangeably. The term “additionality benchmark” which serves as the criteria against which additionality is determined, is also consistently used throughout the methodology framework and performance module. 2. The Developer has revised the text in section 8.4 of the methodology framework that introduces equation 10 to read; “Net GHG emission reductions are calculated as follows” with the reference to leakage being removed. This revision was found to be appropriate since equation 10 does not include leakage, and since leakage is assumed to be zero. 3. The term “damaged” has been replaced by the term “killed” to clarify that mortality (or inevitable mortality) is what is being assessed. The term “killed tree” has also been explicitly defined in section 3.1 of the performance module and is defined as; “A tree that has fallen to the ground, been uprooted or with its trunk snapped below the first branch.” Auditor review of the performance module confirmed that the terms “damaged” and “destroyed” that had been used to described trees killed by skidding equipment have indeed been replaced with the term “killed.” 4. The Developer has removed the qualifier “intentionally” when referencing felled trees. In their NCR response document (document 1a) they indicate that they agree use of this term was redundant as intention is already implied in the defining of felled trees. Auditor review of the updated performance module confirmed that all cases where the term “intentionally” was used in reference to felled trees have now been removed to simply states “felled trees.” The revisions made to the methodology framework and performance module by the Developer with respect to the inconsistencies noted in this NCR were found to address the auditor’s original concerns.

	This NCR is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	13/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principle of Accuracy
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
Some parameters included as default values in the module are not appropriately justified, including: 1. *FB* which is described as the conservative estimate of forest biomass prior to haul road clearing minus roundwood extracted. As this default is not included in the parameters tables, no source or justification is provided. The audit team also notes that 232.7tC/ha is a relatively high value for tropical forest carbon stocks and may undermine the credibility of the module without further justification. The audit team notes that carbon stocks in Kalimantan are generally higher than the global average for tropical forests.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 6a, 11a, 12a
Findings for Evaluation of Evidence:	The developer has included a parameter table for *FB* with a reported value of 232.7 tC/ha. The developer has justified this value as conservative in that it equals the lower 95% confidence bound of mean above and below-ground carbon stocks in pre-logging forests (heavily-stocked Dipterocarp stands targeted for logging) in the applicable geography, after deducting for roundwood extracted. The value is sourced from peer reviewed (Griscom et al 2014). The developer has further justified the value as

	conservative based on other published literature (Pearson et al. 2014, Table 6) which reports that mean pre-logging forest carbon stocks within logging concessions of East Kalimantan are 332 tC/ha, substantially higher than that reported by Griscom et al. (2014). This non-conformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	14/15
Standard & Requirement:	VCS Standard Section 2.4.1, Principle of Accuracy
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
Section 5.2.3 of the module describes the steps for monitoring hauling impact parameters. The developer requires that a sampling map is developed using minimum 30m spatial resolution remote sensing imagery and that measurement of haul road widths is conducted using minimum 2m spatial resolution remote sensing imagery. These minimum cutoffs would only be effective if they were actually maximum cutoffs for spatial resolution.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of	The developer has clarified the language in Section 5.2.3 of the performance module, replacing the term

Evidence:	"minimum spatial resolution" with "maximum spatial resolution". The nonconformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	15/15
Standard & Requirement:	VCS AFOLU Requirements, section 4.8.1
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
The parameter $Haul_{EKt}$ is included in the parameters in Section 6 of the module, however review of both the methodology and the module indicates that this parameter is never included or referenced in the text of either document. $Haul_t$ is provided in Section 5.2.3, which has the same description as $Haul_{EKt}$.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 11a, 12a
Findings for Evaluation of Evidence:	In the response to this NCR, the Developer indicates that the parameter $Haul_{EKt}$ that appeared in section 6.2 has been changed to $Haul_{Mt,}$, which now matches the parameter referenced in section 5.2.3. Auditor review of the updated performance module, section 6.2, Data and Parameters Monitored confirmed that this change was indeed made to this parameter which now appears as $Haul_{Mt.}$ Section 6.2 of the

	performance module describes this parameter as; “Hauling impact for application in East Kalimantan: average area of cleared haul road corridors, inclusive of log landings accessing annual harvest block from year t. The Developer has revised the $Haul_{Mt}$ value appropriately and in conformance with the VCS requirements.
NCR Status:	CLOSED
Comments (optional):	

NCR#:	16/15
Standard & Requirement:	VCS Standard, section 4.8.4
Report Section:	Section 3.10
Description of Non-conformance and Related Evidence:	
With regards to monitoring frequency, the methodology states that “throughout the project crediting period, monitoring must be conducted after each harvest, on not less than annual intervals.” It is not clear if this is meant to indicate that monitoring shall occur at a minimum annually, or if it indicates that monitoring cannot occur more frequently than annually. Discussions with the developers indicated that the intent of the monitoring frequency in the methodology was to require that monitoring take place after each harvest. The intended monitoring frequency needs to be clarified, and maximum allowable monitoring periods need to be defined.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by	Documents 1a, 2a , 3a, 11a, 12a

Organization:	
Findings for Evaluation of Evidence:	In response to this NCR, throughout the methodology framework, with respect to monitoring frequency, the Developer has changed the description of the monitoring frequency to read; "Throughout the project crediting period, monitoring must be conducted within five years after each harvest unless otherwise specified in the applicable geographic-specific performance method module. Monitoring shall not be conducted more frequently than once per year." This added text clarifies the issue and provides reasonable requirements which are further adapted appropriately at the level of the module. In the East Kalimantan performance meth module (section 5.2), the Developer has added the following requirement with respect to monitoring frequency; "monitoring must be conducted within two years after each harvest." The Developer asserts that this requirement was added to reflect the transient nature of the impact parameters used. The monitoring tables, section 6.2 – Data and Parameters Monitored (frequency of monitoring/recording line) have also been updated with "Within two years after each annual harvest." This requirement is in accord with the new methodology framework requirement and addresses concerns that the audit team has expressed about the rapid rate of decomposition in East Kalimantan and ensuring that evidence of damaged trees, etc. necessary for corroboration of carbon accounting by future audit teams will be preserved. The nonconformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

NCR#:	17/15
Standard & Requirement:	VCS Standard 4.5.2; VCS Standard 4.1.17 1)
Report Section:	Section 3.7

Description of Non-conformance and Related Evidence:	
VCS Standard 4.5.2 requires that methodologies using a standardized method for determining the crediting baseline shall describe the most plausible baseline scenario to the extent possible and VCS Standard 4.1.17 1) requires that a current distribution of performance in the sector be described. The audit team observes that the baseline scenarios for the Hauling and Skidding parameters are either self-evident or sufficiently described. However, the baseline scenario for the felling parameters (FELL1 and FELL2) are not described in detail in the module. It is not clear to a methodology reader why a for profit concession would be abandoning significant proportions of felled merchantable trees or felled merchantable log length, and the specific technologies that can be used in RIL-C to reduce this waste are also described only very generally.	
Corrective Action Request:	Organization shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.
Timeline for Conformance:	Prior to Validation
Evidence Provided by Organization:	Documents 1a, 2a, 3a, 11a, 12a
Findings for Evaluation of Evidence:	The developer has added additional text to Section 5.1 of the performance module adding further clarification to the baseline practices. The description of baseline rates of log recovery are based on the experience and observations of the team that conducted the field research underpinning the Griscom et al 2014 paper on which much of the module is based upon and which has undergone peer review as part of the process of publication in the high impact journal, *Global Change Biology*. Per the information collected by Griscom et al, inefficiency in log recovery rates occurs due to a number of factors including i) poor communication between fellers and skidders, ii) poor appraisal of unsound trees (i.e. trees with heart-rot and deficiencies) by fellers, iii) the cost of felling trees is lower than the cost of skidding trees and hence final decision on tree extraction falls to the skidder who comes after the fellers and selects the best individual logs, iv) the government imposes a flat volume-based tax on the concession-holder and the permits limit the volume extracted as opposed to annual area logged, as such there is an incentive to extract only the best trees.

	The aggregation of these explanations supports the well-understood and globally observed phenomenon of “high-grading”, or taking only the best and most profitable trees, which tends to occur when the entity extracting and selling the logs does not have a long term investment in the future economic viability and stocking of the forest. This is frequently the case in concessions, such as those in East Kalimantan. The additional text provided in the module in Section 5.1 is sufficient to demonstrate conformance with VCS Standard 4.5.2 and VCS Standard 4.1.17. Conformance has been demonstrated and this non-conformance is therefore closed.
NCR Status:	CLOSED
Comments (optional):	None

Observations:

OBS	01/15	Reference Standard & Requirement:	
Description of findings leading to observation:	Section 5.1 of the methodology module provides a description of the sampling approach that was followed for derivation of the impact parameters, crediting benchmarks, and additionality benchmarks. This description indicates that a stratified random sample was used, but also implies the sample was biased towards logging concessions in which TNC had an existing relationship and concessions that were FSC certified. The study used for the development of the module discusses the use of a stratified random sample with one exception, which is that the sample included a greater number of FSC certified concessions in order to be conservative. This sampling approach results in lower baseline levels compared to what is actually expected to occur on the ground.		

Observation:	The Developers should consider revising the methodology module to provide clarity on the sampling approach used for *derivation of the impact parameters, crediting benchmarks, and additionality benchmarks*, and clearly indicate that the stratified random sample had one exception; *a greater number of FSC certified concessions in order to be conservative.*

**OBS 02/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

**OBS 03/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

**OBS 04/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

OBS	05/15	Reference Standard & Requirement:	
Description of findings leading to observation:	Several figures throughout section 5 of the module (procedures) do not include a title identifying the contents of the figure.		
Observation:	For increased clarity, the developers should include a title on each figure throughout the module.		

OBS	06/15	Reference Standard & Requirement:	
Description of findings leading to observation:	*Both the carbon pools "aboveground tree biomass" and "deadwood" are includes in what appears to be an overarching pool "aboveground carbon." This overarching term "aboveground carbon" is not a term included in the definitions in either the methodology framework or performance module.*		

Observation:	The developers should consider incorporating into the definitions section of the methodology framework their formal definition of "aboveground carbon" that applies in the methodology.

OBS	07/15	Reference Standard & Requirement:	
Description of findings leading to observation:	The auditors find this to be an appropriate new region-specific performance method applicability condition, as it is clear that any new region-specific performance methods that are developed and to be applied with this methodology framework need to be in full conformance with the applicable VCS requirements for performance methods. The auditors however note that the foot note in this performance method applicability condition is missing from the methodology framework document.		
Observation:	The developers should consider entering the cited footnote in this Performance Method applicability condition into the Methodology framework.		

OBS	08/15	Reference Standard & Requirement:	
Description of findings leading to observation:	In terms of how the applicable logging landscape is characterized, the module states that it applies to "commercial logging concessions located in East Kalimantan, Indonesia, of Bornean Dipterocarp forest on latosols." And "the class of actors/sector is commercial concession holders." These characterizations do not specify what is considered a commercial logging concession in terms of ownership, size, or management practices etc. When this was discussed with the developers, the auditors were told that the intent was that the applicable logging landscape was to match the study used for the development of the module (documents 5 & 6) which included a comprehensive sample of all commercial logging concessions in East Kalimantan, Indonesia. The developer indicated that a legal term for commercial logging concessions does exist, and was used in the study.		

Observation:	This legal term for commercial logging concessions should be incorporated into the applicability condition or elsewhere in the module.

**OBS 09/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

**OBS 10/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

OBS	11/15	Reference Standard & Requirement:	
Description of findings leading to observation:	The audit team understands the process for mapping skid trails, which is used in monitoring to calculate $SKID_{dens\,t}$ and $Tree_{dam,t}$ however the audit team was only able to understand this after discussion with the methodology developer. The developer noted that a schematic depicting the sampling approach exists in the Griscom et al (2014) paper.		
Observation:	The developer should include the schematic depicting the sampling approach for skid trail networks in the module to increase the clarity of the module.		

OBS	12/15	Reference Standard & Requirement:	VCS Principle of Accuracy
Description of findings leading to observation:	The audit team understands the process for mapping skid trails, which is used in monitoring to calculate $SKID_{dens\,t}$ and $Tree_{dam,t}$ however the audit team was only able to understand this after discussion with the methodology developer. The developer noted that a schematic depicting the sampling approach exists in the Griscom et al (2014) paper.		

Observation:	The module would be greatly improved if it were to include more specific guidance on analyses and evidence that shall be retained to facilitate validation and verification audits. Auditors will need to resample some of the monitoring activities undertaken by proponents, and given that up to five years may pass between verification audits, this data must be meticulously documented in order to facilitate a verification audit. Examples include: -preserving locations at which haul road and log landing widths are measured. -marking or somehow preserving the record of number of trees >20cm DBH which are destroyed along skid trails. -clearly preserving any data used if the project chooses to independently develop the parameters *FTH and FTD.* With most other AFOLU projects, the proponent clearly records the location of sample plots for calculating forest carbon stocks, and the audit team can subsequently resample these plots and confirm measurements. Given that some measurements that proponents will take are of merchantable material which may no longer be on site when the field audit occurs, the audit team will not be able to resample this. Measures or guidance should be developed to ensure proponents can address this uncertainty. -clearly identifying sampling locations where $FELL_{1t}$ and $FELL_{2t}$ are measured, such that an audit team can revisit these areas and resample

OBS	13/15	Reference Standard & Requirement:	
Description of findings leading to observation:	The procedure for measuring FELL2 involves a visual assessment of the percent of the log which was abandoned and left behind. Given the differences in interpretation in visual assessments conducted by different persons there may be a high risk of error in this monitoring procedure.		

Observation:	The audit team feels that a QA/QC procedure would greatly increase the integrity of monitoring of this parameter.

OBS 14/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.

**OBS 15/15 was optionally addressed by the developer to the satisfaction of the auditors and has therefore been removed from this audit report.*

OBS	16/15	Reference Standard & Requirement:	
Description of findings leading to observation:	Under some of the data and parameters available at validation in the methodology framework (f_{BGB} $(SKID_t)$, f_{AGC} $(HAUL_t)$, f_{BGB} $(HAUL_t)$), the description of the data unit/parameter states; "Equation estimating savings factor for emissions from…" The meaning behind the words "saving factor" in these statements is not quite clear, and the auditors question whether the intent for these statements is to simply be "Equation estimating emissions reductions from…" The same words (savings factor) also appear next to the parameter $ER_{fell\_AGC,t}$ in section 8.2, step 2 of the methodology framework.			
Observation:	The developers should consider revising and/or removing the terms "savings factor" under the data and prameters available at validation in the methodology framework where it is found (f_{BGB} $(SKID_t)$, f_{AGC} $(HAUL_t)$, f_{BGB} $(HAUL_t)$)		