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Methodology Assessment Report

ASSESSMENT OF THE VCS METHODOLOGY: "REWETTING OF DRAINED TROPICAL PEATLANDS IN SOUTHEAST ASIA"

REPORT NO. 600500927

05 DECEMBER 2013

TÜV SÜD Industrie Service GmbH

Carbon Management Service
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Methodology Category	**Methodology**	**X**
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	Module	
	Tool	
Sectoral Scope(s)	Scope 14 (WRC-RWE)	

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Work Carried Out By	Audit Team: Sebastian Hetsch, Martin Opitz, Matthias Drösler

Summary:

TÜV SÜD Industrie Service GmbH (TÜV SÜD) performed the second assessment of proposed Verified Carbon Standard (VCS) methodology “Rewetting of drained tropical peatlands in southeast Asia”.

The assessment was conducted on the basis of the VCS Standard version 3.4 and respective guidance documents. The assessment was performed by means of a document review, follow-up interviews, and the resolution of outstanding issues.

Findings raised are summarized in this report and detailed in Annex 1 of the report. A total of 15 Corrective Action Requests and eight Clarification Requests were issued.

In summary, TÜV SÜD concludes that the final version of the methodology (version 12, dated 16 September 2013) methodology meets current relevant VCS requirements and recommends the methodology to be accepted by the VCSA.

Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
ASCII	American Standard Code for Information Interchange
ASPRS	American Society for Photogrammetry and Remote Sensing
CAR	Corrective Action Request
CB	TÜV SÜD Certification Body "climate and energy"
CDM	Clean Development Mechanism
CR	Clarification Request
DOE	Designated Operational Entity
DSM	Digital Surface Model
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
GHG	Green House Gas(es)
GIS	Geographic Information System
GPG	Good Practice Guidance
GPS	Global Positioning System
GRL	Green Resources Limited
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
KSA	Kolmogrov-Smirnov Test
LULUCF	Land-Use, Land-Use Change and Forestry
LiDAR	Light Detection and Ranging
ME	Mean Error
MP	Monitoring Plan
NGO	Non Governmental Organisation
PD	Project Document
PDOP	Position Dilution of Precision
PP	Project Participant
PRA	Participatory Rural Appraisal
SOP	Standard Operating Procedure
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VVB	Validation, Verification Body
WRC	Wetlands Restoration and Conservation

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1 INTRODUCTION

1.1 Objective

The company WWF Germany has commissioned TÜV SÜD Industrie Service GmbH to conduct an evaluation of its new AFOLU methodology "Rewetting of drained tropical peatlands in southeast Asia" with regard to the relevant VCS requirements. The evaluation objective is an assessment by a Third Party (VVB) of the proposed new methodology against all defined criteria set for methodology approvals under the VCS.

In particular, the baseline methodology, it's consistence with the monitoring methodology, emission reduction calculations and the methodology's compliance with the requirements of the VCS standard are evaluated. This report summarizes the findings of the evaluation. The present report represents the second approval within the double approval process as defined by VCS.

1.2 Scope

The scope of evaluation of proposed new methodology is defined as an independent and objective review of the baseline and monitoring methodology and other relevant documents.

The information in these documents is reviewed against the requirements of the VCS, in particular:

- VCS standard version 3.4;
- VCS AFOLU Requirements version 3.4;
- VCS Methodology Approval Process version 3.5;
- Technical expertise relevant to the scope and technical area of WRC projects.

1.3 Summary Description of the Methodology

The proposed project type covered by this methodology is aimed at reducing greenhouse gas (GHG) emissions from peat oxidation by rewetting previously drained tropical peatlands through technical means (e.g. the establishment of dams in drainage waterways). Projects quantified under the methodology will have effects on greenhouse gas emissions through the reduction of carbon dioxide (CO2) emissions due to decreased oxidation of soil organic material.

The application of the methodology requires the computer assisted modelling of the ground-water level by applying the SIMGRO model with and without the implemented technical means in order to rewet the peatlands. CO2 emissions from peat oxidation are calculated considering the daily water levels relative to the peat surface in the project area and a CO2 emission factor linking water levels to CO2 emissions from oxidation.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

The methodology assessment applies standard auditing techniques to assess the correctness of the information provided by the project participants. The work starts with the appointment of the team covering the technical scope(s) and sectoral scope(s) for evaluating the VCS methodology activity. Once the methodology is received, members of the team carry out the desk review, office session with the developers, resolution of issues identified and finally preparation of the assessment report. The prepared assessment report and other supporting documents then undergo an internal quality control by the Certification Body "Climate and Energy" of TÜV SÜD, before final submission of the assessment report.

In order to ensure transparency, assumptions are clear and explicitly stated; the background material is clearly referenced. TÜV SÜD developed methodology-specific checklists and protocols customised for the project. The protocol shows, in a transparent manner, criteria (requirements), the discussion of each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol serves the following purposes:

- To organize the details and provision of clarifications on the requirements of which a VCS methodology is expected to meet
- To elucidate how a particular requirement has been validated as well as to document the results of the assessment and any adjustments made to the methodology document.

The assessment protocol consists of two tables. The different columns in these tables are described in the figure below.

Assessment Protocol Table 1: Conformity of Methodology

VCS Requirement	Reference	Comments	Draft Conclusion	Final Conclusion
The checklist is organised in sections following the arrangement of the respective VCS requirements for methodologies.	Gives reference to documents where the answer to the checklist question or item is found.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is used to explain the conclusions reached. In some cases sub-checklist are applied indicating yes/no decisions on the compliance with the stated criterion. Any **Request** has to be substantiated within this column	Conclusions are presented based on the assessment of the first methodology version. This is either acceptable based on evidence provided (☑), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification Request (CR)** is used when the validation team identified a need for further clarification.	Conclusions are presented in the same manner based on the assessment of the final methodology version and further documents including assumptions presented in the documentation.

Assessment Protocol Table 2: Summary of Requests and Responses of Methodology Developer

Clarifications and Corrective Action Requests	Ref. to VSC requirements	Summary of response by methodology developer	Conclusion by Audit Team
Corrective Action or Clarification Requests from table 1 are listed in this section.	Reference to the respective VCS requirement.	The responses given by the client or other project participants during the communications with the validation team should be summarised in this section.	This section summarises the discussion on and revision to methodology together with the audit team's responses and final conclusions. The conclusions is also reflected in Table 1, under "Final Conclusion".

The completed validation protocol is enclosed in Annex 1 to this report.

2.2 Document Review

A first version of the Methodology was submitted to TÜV SÜD in July 2012. This methodology version and additional background documents related to the methodology were reviewed to verify the correctness, credibility and interpretation of the presented information, furthermore a cross-check between information provided and information from other sources was carried out as initial step of the assessment process. A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.3 Interviews

On 4 Oct 2012 a conference call was set up to discuss with the methodology developer and relevant expert who contributed to the methodology to confirm relevant information and to resolve issues identified in the first document review. Further phone calls and meetings were arranged after the first conference call. The table below provides a list of all persons interviewed in this context:

Name	Organisation
Guénola Kahlert	WWF Germany
Erin Swails	Winrock International
Sarah Walker	Winrock International
Henk Wosten	Alterra Wageningen
Ab Veldhuizen	Alterra Wageningen
Peter Navratil	RSS Remote Sensing Solution GmbH
Yougha von Laer	WWF Germany

2.4 Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment, TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy".

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

- Assessment Team Leader (ATL);
- Validator (VAL);
- Validator Trainee (T);
- Technical Experts (TE).

It is required that the sectoral scope(s) and the technical area(s) linked to the methodology and project have to be covered by the assessment team. For this particular project the assessment team members are presented in the table below. The respective appointment certificates are attached to this report as annex 3.

Assessment Team:

Name	Qualification	Coverage of scope	Coverage of technical area	Coverage of financial aspect
Sebastian Hetsch	ATL	☑	☑	☑
Martin Opitz	VAL	☑	☑	
Matthias Drösler	TE		☑	

Technical Reviewers are Karin Wagner and Martin Seitz (covering the respective Technical Area 14.1).

2.5 Resolution of Findings

The objective of this phase of the assessment is to resolve the requests for corrective actions and clarifications and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the methodology. All Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the assessment process, the concerns raised and responses that were given are summarised in chapter 3 below and documented in more detail in the validation protocol in Annex 1.

The methodology version 12 that was submitted in November 2013 served as the basis for the final assessment presented herewith.

2.6 Internal Quality Control

Internal quality control is the final step of the assessment process and is conducted by the Certification Body (CB) “climate and energy”. The CB checks the final documentation, which includes the assessment report and annexes.

Technical Reviewers appointed by the CB carry out corresponding review work. The completion of the quality control indicates that each report submitted has been approved either by the head of the CB or the deputy. In projects where either the Head of the CB or his/her deputy is part of the assessment team, the approval is given by the one not serving on the project team.

3 ASSESSMENT FINDING

3.1 Relationship to Approved or Pending Methodologies

There are currently no methodologies to account for emission reductions resulting from the rewetting of tropical peatlands in Southeast Asia.

3.2 Stakeholder Comments

Period of the global stakeholder consultation process: 13-12-2011 until 12-01-2012	
Comment submitted by: Peter Schlesinger, Carbon Decisions International	**Issues raised:** 1) The method doesn't take into consideration, and therefore monitor, any potential impacts of natural disaster or accidental fire. 2) Canopy height measurement is faulty, p. 13. Says SRTM DSM to be analyzed with remote sensing image with same time range as SRTM +/- 6 months, yet SRTM was created in Feb. 2000. 3) Also the profile spacing for the interpolation of a suitable terrain model is suggested to be just under 5 km; this seems much too far to me to be adequate.
Response by methodology developer: 1) Accounting and therefore monitoring of the impacts of natural disasters or accidental fire is implicit in the requirements of the VCS AFOLU Non-Permanence Risk Tool that sets out the procedure for conducting non-permanence risk analysis and buffer determination for AFOLU projects. Therefore the comment is not significant. 2) The requirements for the date of the SRTM creation have been modified to remove the timeframe requirements. 3) The profile spacing for interpolation of the DTM needs to be adjusted most importantly to the size of the project area and homogeneity of the terrain. Ombrogenous peatlands, although dome shaped, are relatively flat with very small elevation changes from the highest point in the dome to the edges of the dome. Nonetheless, although 5 km is the maximum acceptable threshold, the methodology states "Spacing must be adjusted to terrain heterogeneity, i.e. the number of profiles must be increased with increasing complexity."	
Response by TÜV SÜD: 1) The methodology does not account for GHG due to avoided fire-related emissions, and therefore there is no need to monitor for potential emissions from the project scenario. The assessment team considers it conservative not to account for emissions due to avoided firs. 2) The methodology has been adapted accordingly. A time/date indication is not provide but sufficient specification in order to avoid significant changes of the situation of the land cover. 3) The audit team assessed the clarification provided in the assessment report provided by SCS as result of the first assessment (NCR 2011.68, Appendix A) and found it to be rational. The methodology developer has taken due account of the comment and provided adequate respond.	

Comment submitted by: Igino Emmer, Silvestrum; John Couwenbert, Greifswald University	**Issues raised:** 1) No applicability conditions are formulated for land use in the baseline or project scenario. The type of land use will affect the choice of pools to be included, however. The assumption that ABG tree biomass will always be lower in the BSL than in the WPS as well as the assumption that HWPs can conservatively be omitted, are dependent on land use. The methodology should include applicability conditions to address the type of land use and (in general) provide criteria to judge applicability. 2) The modeling of water level can be done using other tools than SIMGRO. The methodology should establish parameters and equations for forecasts of water levels. The methodology should allow other tools than SIMGRO for the required calculations. 3) There is no justification in the methodology or the literature that SIMGRO can be applied to tropical peats. The absence of the calibration results challenges the review of the methodology. Will public review be reopened once this material is available? No justification or monitoring of hydrological input parameters (notably hydraulic conductivities) is required by the methodology. These input parameters seriously affect the outcome of the modeling, however.

Response by PPs:

1) The following applicability condition has been added to the methodology: The project demonstrates that baseline conditions in the project area can be expected to result in equal or lower aboveground tree biomass compared to the project scenario. Therefore, under the applicability condition, it is conservative to assume that change in aboveground biomass is zero in the baseline and project case. Under the applicability condition “Baseline land use activities taking place within project boundary will not be displaced by project activities” HWP stocks would not be expected to be lower in the project case compared to the baseline as a result of project activities, therefore it is conservative to omit HWP.

2) Although modeling of water levels can be done using other tools than SIMGRO, the methodology cannot be required to allow other tools for the required calculations or include non-modeling approaches such as “parameters and equations for forecasts of water levels.”

3) SIMGRO has been used to model water levels in tropical peatlands in a peer-reviewed publication: Wosten, JHM, Clymans, E, Page, SE, Rieley, JO, Limin, SH. 2008. Peat-water interrelationships in a tropical peatland ecosystem in Southeast Asia. Catena 73: 212 – 224. Furthermore the methodology provides guidance on validation of the SIMGRO model to determine whether SIMGRO is adequate for modeling water levels in the project area. Therefore the comment that there is no justification in the methodology or the literature that SIMGRO can be applied to tropical peats is not valid. We cannot comment on whether the public review will be reopened. Hydraulic input parameters for SIMGRO provided by the methodology have been calibrated for peatlands in Southeast Asia: Jaenick, J, Wosten H, Budiman, A, Seigert, F. 2010. Planning hydrologic restoration of peatlands in Indonesia to mitigate carbon dioxide emissions. Mitigation and Adaptation Strategies for Global Change 15: 223 – 239. Therefore the comment that there is no justification of these parameters is not valid. As these parameters are provided as defaults by the methodology, monitoring is not required.

Response by TÜV SÜD:

1) The methodology developer has taken due account of the comment. In line with 4.3.1 of the VCS AFOLU requirements wood products are not obligatory to be considered under the WRC project category.

2) The assessment team agrees that the methodology cannot be required to allow the use of models other than SIMGRO.

3) The methodology developer provided information that the model chosen is applicable for tropical peat lands. The assessment team reviewed the literature provided and supports the perception of SCS (first assessment) that the applicability of SIMGRO, and the suggested default hydraulic input parameters, within the context of the methodology element has been adequately established. Further it has to be noted that the methodology requires to validate the water level predictions at project start and during the project lifetime.

3.3 Structure and Clarity of Methodology

The methodology is written in a clear, logical, concise and precise manner:

- The methodology developer followed the instructions provided in the methodology template provided. Criteria and procedures for the application of the methodology are provided in the appropriate sections of the methodology template.

- The terminology used is consistent with that used in the VCS Program respectively in the GHG accounting in general.

- Frim requirements, (non-mandatory) recommendations and permissible or allowable options are clearly defined by using respective modal verbs.

- Criteria and procedures provided in the methodology are written in an understandable, readily and consistently manner so that the methodology can be applied by potential project developers.

- 'The manner criteria and procedures are provided in the methodology allows potential VVBs to unambiguously validate/verify projects against the methodology.

The methodology complies with essential requirements in terms of terminology used, unambiguousness of requirements demanded and clarity of criteria and procedures provided. Thus, the methodology offers the structure and clarity required to be thoroughly applicable.

3.4 Definitions

Key terms are clearly and appropriately defined and consistently used throughout the methodology. The definitions provide sufficient clarity in order to prevent any kind of misapprehension. Key terms are listed in alphabetical order as required. Terms already defined under the VCS Program are not repeated as required. Key acronyms used in the methodology are listed on page 3.

3.5 Applicability Conditions

The methodology provided a set of 14 applicability conditions determining:

- region and type of peat
- annual water levels allowed
- model to by applied for the modelling of the water-level
- conditions of the watershed respectively project areas
- allowed baseline land use
- project activities allowed and impacts of those to the water level
- obligations for the land use before project start
  obligations of the land use in adjacent areas

The applicability conditions provided are appropriate for the project activities targeted and the quantification procedures set out by the methodology. As a whole, the applicability conditions clearly determine which project activities are eligible and which are not under the methodology. The applicability conditions as a whole are consistent and correlating.

In the following table, the applicability conditions are listed and clarified if:

a) the applicability condition is written in a sufficiently clear and precise manner and if It can be determined whether the project activity meets with the condition;
b) Conformance with the condition can be demonstrated at the time of the project validation.

No	Applicability Condition	a)	b)
1	To be eligible for VCS crediting all lands included within the project boundary must meet an internationally accepted definition of ombrogenous tropical peatlands occurring in lowlands at an elevation less than 100 m above sea level within Southeast Asia (here defined as: Malaysia, Indonesia, Brunei, or Papua New Guinea).	Yes	yes
2	Baseline and with-project water levels are modeled over time using the latest version of the model SIMGRO that has been adjusted for ombrogenous peat swamps in southeast Asia. Where validation of the model for project conditions using field measurements does not meet accuracy requirements specified in Section 8.1.1.6 of this methodology, this methodology is not applicable and cannot be used.	Yes	yes
3	Mean annual water level below peat surface within the project boundary within the baseline and project scenario cannot be greater than 1 meter in depth.	Yes	yes
4	The Watershed(s) of Interest that include the project area comprises one or more complete watersheds. The Watershed(s) of Interest are not hydrologically connected to adjacent peatland and non-peatland areas outside the project boundaries.	Yes	yes
5	Baseline land use activities in the project boundary cannot include deforestation, planned forest degradation, land use conversion, crop production, or grazing of animals.	Yes	yes
6	Baseline land use activities taking place within project boundary will not be displaced by project activities other than potential displacement of illegal selective logging.	Yes	yes

7	The project demonstrates that baseline conditions in the Watershed(s) of Interest can be expected to result in equal or lower aboveground tree biomass compared to the project scenario.	Yes	yes
8	The project activity cannot include the creation of additional drainage waterways or other types of infrastructure that causes drainage.	Yes	yes
9	The project activity cannot include any agricultural activities.	Yes	yes
10	The project activity is carried out only in areas where, at project start, no enforced policies or regulations require the restoration of peatlands (i.e. rewetting) and where no restoration activities will take place in the absence of the project activity.	Yes	yes
11	Peatland restoration occurs through technical means (such as dam construction) that increase annual average water levels within the project boundary. This will result in the maintenance of soil carbon stocks in comparison to the baseline situation. Not all drainage waterways within the project area have to be dammed by the project activities.	Yes	yes
12	Current and/or potential future land use activities within the Excluded Area of Watershed(s) cannot have a significant negative impact on the project area, therefore cannot include the creation of additional drainage waterways, deforestation, land use conversion, crop production, or grazing of animals, but may include planned forest degradation. The project proponent must provide documented evidence demonstrating that current and/or potential future land use activities in the Excluded Area of Watershed(s) meet these requirements. Acceptable evidence could include land use plans, laws, or resource concession rights.	Yes	yes
13	Current and/or potential future land use activities taking place within the Excluded Area of Watershed(s) will not be displaced by project activities.	Yes	yes
14	The Watershed(s) of Interest does not include areas where N-based fertilizers have been or plan to be applied. The project proponent must provide documented evidence demonstrating that current and/or potential future land use activities in the project boundary and the Excluded Area of Watershed(s) meet these requirements.	Yes	yes

3.6 Project Boundary

The methodology distinguishes between different types of boundaries necessary to apply the methodology

As **boundaries** the following have to be identified:

1) Watershed(s) of interest
2) Project area boundary (Project boundary)
3) Excluded area of watershed(s)

The methodology provides detailed criteria and procedures to specify the mentioned geographical boundaries:

1. Watershed(s) of interest have to be identified on basis of digital terrain models and thus the hydrological conditions of the area.
2. The Project area boundary has to be identified on land under control of the project proponent and on peatland identified via remote sensing imagery or a digital terrain model combined with a peat thickness model.
3. Excluded area of watershed has to be described according to a list of parameters to be collected.

The boundaries described are necessary in order to adequately apply the obligatory SIMGRO model. Further, the defined boundaries are necessary toensure respectively control the adherence of the applicability conditions defined. Thus the boundaries required to be defined by project proponents are appropriate for the application of the methodology and project activities targeted.

The methodology contains the following carbon pools in accordance with the VCS AFOLU requirements as described below:

Carbon pool	Included?	Comment assessment team
Aboveground tree biomass	Yes	Required for inclusion by VCS AFOLU Requirements Section 4.3.1. As the applicability conditions require that “baseline conditions in the project area can be expected to result in equal or lower aboveground tree biomass compared to the project scenario”, the pool can be conservatively excluded from accounting in accordance with Section 4.3.4.
Aboveground non-tree biomass	No	Optional carbon pool in accordance with VCS AFOLU Requirements, Section 4.3.1
Belowground biomass	No	Optional carbon pool in accordance with VCS AFOLU Requirements, Section 4.3.1
Litter	No	To be excluded carbon pool in accordance with VCS AFOLU Requirements, Section 4.3.1
Deadwood	No	Optional carbon pool in accordance with VCS AFOLU Requirements, Section 4.3.1
Soil	Yes	Required for inclusion by VCS AFOLU Requirements Section 4.3.1.
Wood Products	No	Optional carbon pool in accordance with VCS AFOLU Requirements, Section 4.3.1

The methodology contains the following GHG sources in accordance with the VCS AFOLU requirements as described below:

Source		Gas	Included?	Justification/Explanation
Baseline	Peat oxidation	CO_2	Yes	Main source and gas to be addressed by project activities.
		N_2O	No	Required for inclusion within the project boundary by the VCS AFOLU Requirements, Section 4.3.24, but conservatively excluded from accounting in the baseline scenario in accordance with Section 4.3.4.
		CH_4	No	Required for inclusion within the project boundary by the VCS AFOLU Requirements, Section 4.3.23, but conservatively excluded from accounting in the baseline scenario in accordance with Section 4.3.4.
Project	Peat oxidation	CO_2	Yes	Main source and gas to be addressed by project activities.
		N_2O	No	Required for inclusion within the project boundary by the VCS AFOLU Requirements, Section 4.3.24, but conservatively excluded from accounting in the baseline scenario in accordance with Section 4.3.4.
		CH_4	No	Required for inclusion within the project boundary by the VCS AFOLU Requirements, Section 4.3.23, but conservatively excluded from accounting in the baseline scenario in accordance with Section 4.3.4.

3.7 Baseline Scenario

The methodology uses a project method to identify the baseline scenario. The methodology requires the application of the most recent version of the VCS Tool “Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities” in order to identify potential alternative baseline land use scenarios.

Further the methodology provides an applicability matrix guiding project proponents through five questions ensuring that in the end the most plausible baseline scenario is that the project boundary is drained and will remain drained in the absence of the project. The applicability matrix corresponds with the requirements of section 2.1.3 of the VCS tool that requires to apply a stepwise approach in order to identify the most plausible baseline scenarios.

The obligation to apply the SIMGRO model for modelling the water level in the baseline and the correspondingly necessary input data ensures that:

- current and historic hydrological characteristics of the watershed of interest and its drainage system,
- expected rate of natural damming of waterways and
- the long term climate variables influencing the water table

are accounted for. Thus conformance with Section 4.4.11 of the VCS AFOLU Requirements is accomplished. For further details see also ANNEX 1.

In summary, the procedures for determining the baseline scenario are appropriate, adequate and in compliance with the VCS rules for WRC projects.

3.8 Additionality

The methodology uses a project method to identify the baseline scenario. The methodology requires the application of the most recent version of the VCS Tool "Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" in order to demonstrate additionality. Thus conformance with Section 4.6.2 of the VCS Standard Requirements is accomplished. For further details see also ANNEX 1.

In summary, the tool for demonstrating additionality is appropriate, adequate and in compliance with the VCS rules for WRC projects.

3.9 Quantification of GHG Emission Reductions and Removals

3.9.1 Baseline Emissions

Baseline emissions are quantified following several steps and procedures. First the project developer has to prepare the SIMGRO model. The description of the model preparation is subdivided in different sections.

1. Section 8.1.1.1 provides procedures to generate a land cover map. The procedures follow good practice of remote sensing

2. Section 8.1.1.2 provides procedures to generate a digital terrain model (DTM). The DTM can be generated by either the use of Light Detection and Ranging Data (LiDAR) or radar data.

   LiDAR: Requirements for the technical specification for the LiDAR Data are provided and follow good practice. Full coverage of the LiDAR data is not necessarily required instead of that the measurement of transects are allowed preconditioned defined requirements are fulfilled. The data of the transect measurements are then interpolated for the whole project area. This is justified due to the fact that the topography of tropical peat swamps are usually very even and smooth. For the interpolation mathematical procedures are suggested.

   Radar data: Reasonable steps to derive a DTM from radar data are provided. These steps include the collection of radar data, the determination of the mean height of the vegetation as well as the subtraction from the digital surface model in order to obtain the DTM. The technical specification and procedures provided for the radar data collection respectively the field measurement/calculation of the average vegetation height follow good practice.

   The methodology requires that the accuracy of the DTM has to be assessed against topographic field measurements or, in the case of a radar data based DTM, against a LiDAR data set if available. The criteria and procedures described for the assessment of the accuracy of the DTM are adequate and acceptable for the targeted purpose.

3. Section 8.1.1.3 provides procedures to generate a peat thickness model. The peat thickness model can be produced via drilling data obtained in transects in the field or, in the case that the terrain is partly highly inaccessible via interpolation. Finally an independent accuracy assessment of the peat thickness model is required.

4. Section 8.1.1.4 provides procedures for collection of climate data and a default value for evapotranspiration in the tropics whose applicability shall be validated against recorded evapotranspiration values in the project region.

5. Section 8.1.1.5 provides procedures to delineate waterways starting with the remote sensing delineation of the waterways and followed by a field verification in order to ensure to identify only existing waterways and thus avoid underestimation of baseline emissions. Finally the waterways have to be classified based on physical characteristics and natural damming evidence.

6. Section 8.1.1.6 provides procedures to validate the SIMGRO model for the project area. The SIMGRO model has to meet a certain accuracy otherwise the methodology cannot be applied as set out under the applicability conditions.

As next step in section 8.1.2 the project developer is required to stratify the project area by peat depletion time in accordance with section 4.5.25 of the VCS AFOLU Requirements. The default value for the peat depletion is discussed in section 3.9 of this report. The Peat depletion time as part of the baseline has to be reassessed every verification event or latest every 10 years in accordance with section 4.5.25 of the VCS AFOLU Requirements.

Final the methodology provides criteria and procedures for the ex-ante estimation of baseline water levels in section 8.1.3 and as consequence the ex-ante baseline emissions in section 8.1.4 due to peat oxidation. The emission are estimated as a function of water table level corrected for subsidence due to peat depletion and emission factor that is discussed in section 3.9 of this report. Aboveground biomass is conservatively not accounted for in accordance with section 4.3.1 VCS AFOLU Requirements.

In summary all criteria and procedures described section 8.1 of the methodology are appropriate for project activities covered by the methodology. The procedures for calculating baseline emissions and removals cover all GHG sources, sinks and reservoirs. All algorithms, equations and formulas presented are appropriate and without error. All models and default values are appropriate an in conformance with VCS requirements.

3.9.2 Project Emissions

The procedures provided for estimating the project emissions are similar to those for the estimation of the baseline emissions. The only difference is that the waterway damming measurements that are implemented in the project scenario are modelled in the SIMGRO for ex ante estimation of the water levels in the project scenario.

In summary all criteria and procedures described section 8.2 of the methodology are appropriate for project activities covered by the methodology. The procedures for calculating baseline emissions and removals cover all GHG sources, sinks and reservoirs. All algorithms, equations and formulas presented are appropriate and without error. All models and default values are appropriate an in conformance with VCS requirements.

3.9.3 Leakage

As the methodology developers are generally not accounting for CH_4 emissions e.g. consequence of ecological leakage in compliance with section 4.3.4 of the VCS AFOLU Requirements, the methodology discusses the two types of leakage in compliance with section 4.6.1 of the VCS AFOLU Requirements.

1. Market leakage: Under the applicability conditions legal forest management is not allowed. Thus the only potential source for market leakage could the timber from illegal activities within the project area. As the methodology is not accounting for effects associated with stopping illegal activities the methodology is not accounting for market leakage due to such activities in accordance with section 4.6.16 of the VCS AFOLU Requirements.

2. Activity shifting leakage: In compliance with section 4.6.19 of the VCS AFOLU Requirements the methodology provides adequate procedures to account for leakage due to shifting of illegal activities. It is required that the potential for illegal activity shifting leakage within the project area is estimated based on periodically conducted participatory rural appraisal (PRA). Potential leakage is calculated as a function of area that may have been impacted, volume of timber available for extraction, wood density and a Logging Damage Factor (LDF) that is discussed in Section 3.10 of this report.

In summary all criteria and procedures described section 8.3 of the methodology are appropriate, adequate and in compliance with the VCS rules for WRC projects.

3.9.4 Net GHG Emission Reductions and Removals

The calculation of the net GHG Emission Reductions and Removals are appropriate for the project activities covered by the methodology comply with Section 4.7.1 and 4.7.2 of the VCS Standard. All algorithms, equations and formulas provided are appropriate and without error.

In accordance with section 4.1.4 of the VCS Standard the methodology requires an allowable uncertainty of +/- 30% at a 95% confidence level. The uncertainty is calculated based on the uncertainty assessment of the estimated water level by applying the SIMGRO model and measured water levels in the project area. This approach is rational as the calculation of GHG emission reductions and removals are directly linked to the SIMGRO-derived estimated water levels.

Uncertainty of the DTM and the Peat Thickness Model is accounted for in sections 8.1.1.2 and 8.1.1.3.

In summary all algorithms, equations and formulas used are appropriate and without error. Any uncertainties associated with the quantification of net GHG emissions reductions and removals are addressed appropriately and in compliance with the VCS rules for WRC projects.

3.10 Monitoring

The specification for monitored and not monitored data and parameters are set out in sections 9.1 and 9.2 of the methodology element. For data and parameters that require measurement appropriate procedures for measurements are provided in section 9.3.

In the following table, the parameters available at validation provided in section 9.1 of the methodology are listed and clarified if they appropriate in terms of:

a) Data unit
b) Source of data
c) Value applied
d) Justification of choice of data or description of measurement methods and procedures to be applied
e) Purpose of data

Parameter	Description	a)	b)	c)	d)	e)	Comments
$H_{ind,loc,LC}$	Height of individual *Ind* at sampling location *loc* within land cover class *LC*;	yes	yes	yes	yes	yes	none
$Z_{val,q}$	Validation elevation value q	yes	yes	yes	yes	yes	none
$Z_{DTM,q}$	DTM elevation value q	yes	yes	yes	yes	yes	none
$PTh_{val,q}$	Validation peat thickness value q	yes	yes	yes	yes	yes	none
$PTh_{MOD,q}$	Modeled peat thickness value q	yes	yes	yes	yes	yes	none
$Ch_{A,m,p,w}$	Value of waterway characteristic *A* for waterway measured *m* at measurement point *p* for water class *w*	yes	yes	yes	yes	yes	none
$Meas_g$	Measured water level relative to the peat surface value *g*	yes	yes	yes	yes	yes	none
Mod_g	Model calculated water level relative to the peat surface *g*	yes	yes	yes	yes	yes	none
j_{max}	Maximum absolute modelled value of wa-	yes	yes	yes	yes	yes	none

	ter table level relative to the peat surface; cm						
$PThx_{,t0}$	Peat thickness in grid cell *x* at the start of the project activity	yes	yes	yes	yes	yes	none
S_p	Peat subsidence rate (1.58 cm yr^{-1})	yes	yes	yes	yes	yes	The value of 1.58 cm yr^{-1} is at the lower end of recent literature.
$t_{crediting\_period}$	Length of crediting period	yes	yes	yes	yes	yes	none
A_{grid_x}	Area of peat thickness model grid cell *x*	yes	yes	yes	yes	yes	none
$\Delta C_{AB\_treexi,t}$	Net carbon stock change aboveground tree biomass pool in *grid cell x* in year *t*	yes	yes	yes	yes	yes	none
J	SIMGRO modelled water table level relative to the peat surface, (maximum 100 cm)	yes	yes	yes	yes	yes	none
$A_{Excluded}$	Total area of the Excluded Area of Watershed(s).	yes	yes	yes	yes	yes	none
EF_{CO2}	Emission factor; EF_{CO2} = 98	yes	yes	yes	yes	yes	The CO^2 emission factor is based on a review of GHG fluxes from tropical peatlands in SE Asia including multiple sites in Southeast Asia, and therefore the emission factor is broadly applicable to tropical peatlands in Southeast Asia. However an alternative emission factor may be used if justifiable for the project area and supported by scientific literature.
Δhead	Desired head difference	yes	yes	yes	yes	yes	none
cascade_slope	Average slope of cascade of dams	yes	yes	yes	yes	yes	none
CF	Carbon fraction of	yes	yes	yes	yes	yes	The methodology element requires a default value of 0.47 t C t-1 d.m., which

	biomass						conforms to IPCC common practice.
LDF	The logging damage factor (LDF) is a representation of the quantity of emissions that will ultimately arise per unit of extracted timber (m^3). These emissions arise from the non-commercial portion of the felled trees (the branched and stump) and trees incidentally killed during felling.	yes	yes	yes	yes	yes	The default value of 0.67 t C m^{-3} is derived from "the slope of the regression equation between carbon damaged and volume extracted based on 774 logging gaps measured by Winrock International in Bolivia, Belize, the Republic of Congo, Brazil, and Indonesia". Although this is a broad average value and may not directly correspond with any kind of illegal logging activity in the project area, it will lead to conservative estimates of activity shifting leakage.
D	Average wood density of tropical peatland forest	yes	yes	yes	yes	yes	The default value of 0.57 is reasonable and will likely result in conservative estimates.
Evapotranspiration	Evapotranspiration can be assumed to be a constant daily value of 3.5 mm day^{-1}. Alternatively evapotranspiration may be determined by the closest meteorological station.	yes	yes	yes	yes	yes	The default value of 3.5 mm per day is acceptable as it is required to validate whether the value of 3.5 mm per day is applicable to the project area by comparing the value with other Evapotranspiration values recorded at the closest meteorological station.
V_{EXT}	The volume of timber assumed to be extracted from tropical peatland forest. Default value V_{EXT} = 31 m^3 ha^{-1} may be used.	yes	yes	yes	yes	yes	The default value of 31 m² comes from unpublished data from a forest inventory of peat swamp forest in Central Kalimantan conducted by the University of Palangka Raya. Although this value and may not directly correspond with any kind of illegal logging activity in the project area, it will lead to conservative estimates of activity shifting leakage as it is unlikely that all the timber would be removed by illegal logging activities.

In the following table, the parameters to be monitored provided in section 9.2 of the methodology are listed and clarified if they appropriate in terms of:

a) Data unit
b) Source of data
c) Description of measurement methods and procedures to be applied
d) Frequency of monitoring/recording
e) QA/QC procedures to be applied
f) Purpose of data
g) Calculation method.

Parameter	Description	a)	b)	c)	d)	e)	f)	g)	Comments
Project boundary	Area of project boundary. Project proponent must maintain control over entire project boundary	yes	yes	yes	yes	yes	yes	yes	none
Daily precipitation	Input into SIMGRO Model	yes	yes	yes	yes	yes	yes	yes	none
Evapotranspiration	Evapotranspiration can be assumed to be a constant daily value of 3.5 mm day^{-1}. Alternatively evapotranspiration may be determined by the closest meteorological station.	yes	yes	yes	yes	yes	yes	yes	See comments above
Location and construction date of new and maintained dams	Location and date of dams constructed and maintained. Input into SIMGRO model	yes	yes	yes	yes	yes	yes	yes	none
Area burned	Area burned, and grid cells *x* burned at time *t* in the project area	yes	yes	yes	yes	yes	yes	yes	none
Illegal logging PRA Results	Evidence of presence or absence of illegal logging in and around the project area	yes	yes	yes	yes	yes	yes	yes	none
Land use in Excluded Area of Watershed(s)	Land use activities in area of Watershed(s) of Interest not included in the Project Boundary	yes	yes	yes	yes	yes	yes	yes	none

A_{Deg}	Area potentially impacted by degradation processes in the project area	yes	yes	yes	yes	yes	yes	yes	none
J	SIMGRO modelled water table level relative to the peat surface(maximum 100 cm)	yes	yes	yes	yes	yes	yes	yes	none
$Meas_g$	Measured water level value relative to the peat surface g	yes	yes	yes	yes	yes	yes	yes	none
Mod_g	Model calculated water level relative to the peat surface g	yes	yes	yes	yes	yes	yes	yes	none
V_{EXT}	The volume of timber assumed to be extracted from tropical peatland forest. Default value V_{EXT} = 31 m^3 ha^{-1} may be used.	yes	yes	yes	yes	yes	yes	yes	See comments above
S_p	Peat subsidence rate (1.58 cm yr^{-1})	yes	yes	yes	yes	yes	yes	yes	See comments above
EF_{CO2}	Emission factor; EF_{CO2} = 98	yes	yes	yes	yes	yes	yes	yes	See comments above

In summary, the specification for monitored and not monitored data and parameters is appropriate, adequate and in compliance with the VCS rules.

4 ASSESSMENT CONCLUSION

TÜV SÜD performed an assessment validation of the proposed VCS methodology: “Rewetting of drained tropical peatlands in Southeast Asia“. Standard auditing techniques have been used for the assessment of the methodology. A VCS scope-specific protocol for the methodology was prepared to conduct the assessment process in a transparent and comprehensive manner.

The review of the methodology documentation, subsequent follow-up interviews, and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In the opinion of TÜV SÜD, the methodology meets all relevant VCS requirements if the underlying assumptions do not change. TÜV SÜD recommends the methodology to be accepted by the VCSA.

The assessment was performed following the requirements of the latest version of the VCS Standard and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the VCS methodology approval cycle.

5 REPORT RECONCILIATION

NA

6 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

In line with VCS requirements as stated in the VCS Methodology Approval Process v.3.5, section 4, TÜV SÜD is eligible to conduct this methodology assessment:

- TÜV SÜD is accredited to conduct audits in the sectoral scope 14;
- TÜV SÜD has completed over 10 project validations in the sectoral scope 14, including in particular numerous CDM validations;
- In addition Professor Drösler, an internally recognized WRC expert, and IPCC lead author for peatland was included in the audit team. He is however not formally appointed under VCS.

7 SIGNATURE

Munich, 05 December 2013

Elena Schmidt

Certification Body “climate and energy”
TÜV SÜD Industrie Service GmbH

ANNEX 1: ASSESSMENT PROTOCOL

Table 1: VCS Methodology Assessment Protocol

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
General Requirements (Meth template)				
TITLE PAGE: All items in the box at the bottom of the first page must be completed using Arial 10pt, black, regular (non-italic) font. The box must appear on the first page of this document until the methodology or methodology revision is approved.	1	All items are in Arial 10pt, black and regular. The box appears on the first page as requested	✓	✓
METHODOLOGY: The proposed methodologies must demonstrate that no approved or pending methodology under the VCS Program or an approved GHG program could reasonably be revised to meet the objective of the proposed methodology.	1	On the VCS Webpage there is no comparable methodology listed to quantify GHG emission reduction from rewetting drained tropical peatlands in south east Asia.	✓	✓
All sections must be completed using Arial 10pt, black, regular (non-italic) font. Sections which are not applicable may be left blank but should NOT be deleted from the final document.	1	**Corrective Actions Request 1.** • The table of contents and the table in section 6 are not using 10pt. • The headlines of the sections and subsections are not always in Arial and in blue font colour as requested by the template	**CAR**	✓
General requirements (VCS v3.4 Section 4.1)				
Does the VCS Program methodology use the VCS Methodology Template?	1	The VCS Program methodology uses the VCS Methodology Template as requested.	✓	✓
a) Does such a VCS Program methodology use the VCS Methodology Template for the framework document and the VCS Module Template for the modules and tools? b) Does the framework document clearly state how the modules and/or tools are to be used within the context of the VCS Program methodology? *In Case of Methodologies employing 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.*	1	n.a.	**n.a.**	**n.a.**

Summary of Request and Responses by Methodology Developer

Title of Methodology: Rewetting of drained tropical peatlands in southeast Asia

Number of Pages: 57

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
Does the VCS Program methodology clearly state the assumptions, parameters and procedures that have significant uncertainty, and describe how such uncertainty shall be addressed?	1	**Clarification Request 1.** Clarify if the methodology is based on assumptions, parameters and procedures that have significant uncertainty and how such uncertainty has to be addressed.	**CR**	✓
Where applicable, do elements of the VCS Program methodology provide a means to estimate a 90 or 95 percent confidence interval?	1	The methodology requires a 95 percent confidence interval for: 1) Accuracy of the DTM (Digital Terrain Model); In Case of the derivation of the DTM from a Digital Surface Model (Option 2) the needed assessment of the vegetation height has to be estimated achieving a precision of equal or less than 15% of the mean at the 95% confidence level. **Corrective Actions Request 2.** Clarify why should instead of shall in line 585 and 540. 2) Accuracy of the Peat thickness model 3) Calibrated SIMGRO model Root Mean Square Error is used as uncertainty measure, in case of non-normal distribution a 95% confidence interval has to be applied. Possible deductions due to uncertainties are based on the outcome of the validation of the accuracy of the SIMGRO model as the model is the basis for the estimation of the GHG emissions.	**CAR**	✓
Where a 90 percent confidence interval is applied and the width of the confidence interval exceeds 20% of the estimated value or where a 95 percent confidence interval is applied and the width of the confidence interval exceeds	1	The methodology provides an equation for deduction in case the confidence interval exceeds 30% by a 95% confidence level. See also comment below regarding appropriate confi-	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
30% of the estimated value, does the VCS Program Methodology apply an appropriate confidence deduction?		dence deduction.		
Are the methods for estimating uncertainty used by the VCS Program Methodology based on recognized statistical approaches such as those described in IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories?	1	The methods for estimating uncertainty to be applied are based on recognized statistical approaches.	✓	✓
Do confidence deductions applied by the VCS Program methodology use conservative factors such as those specified in the CDM Meth Panel guidance on addressing uncertainty in its Thirty Second Meeting Report, Annex 14?	1, 3	**Clarification Request 2.** Clarify how conservativeness can be achieved as if the conservative factors specified in the CDM Meth Panel guidance (32nd Meeting Report, Annex 14) would have been applied.	**CR**	✓
In the case the VCS Program methodology mandates the use of specific models to simulate processes that generate GHG emissions (ie, the project proponent is not permitted to use other models), is the following applied, given the note below: 1) Models shall be publicly available, though not necessarily free of charge, from a reputable and recognized source (eg, the model developer's website, IPCC or government agency). 2) Model parameters shall be determined based upon studies by appropriately qualified experts that identify the parameters as important drivers of the model output variable(s). 3) Models shall have been appropriately reviewed and tested (e.g., ground-truthed using empirical data or results compared against results of similar models) by a recognized, competent organization, or an appropriate	1, 2, 14, 15	1) The methodology requires the application of the SIMGRO Model for modelling the water level in the project area. The Model is publicly available and developed by Alterra, a research institute of the Wageningen University and Research Centre concern (Wageningen UR). Thus the source of the model can be rated reputable. 2) The model to be applied has been tested through extensive studies in the Netherlands by qualified experts 3) The model to be applied has been tested and applied in south East Asia. 4) An uncertainty assessment of the model is described and required; an uncertainty assessment of the input parameters is neither described nor required. **Clarification Request 3.** Clarify how the uncertainty of the input parameters shall be assessed.	**CR**	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
peer review group. 4) All plausible sources of model uncertainty, such as structural uncertainty or parameter uncertainty, shall be assessed using recognized statistical approaches such as those described in *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1, Chapter 3*. 5) Models shall have comprehensive and appropriate requirements for estimating uncertainty in keeping with IPCC or other appropriate guidance, and the model shall be calibrated by parameters such as geographic location and local climate data. 6) Models shall apply conservative factors to discount for model uncertainty (in accordance with the requirements set out in Section 4.1.4), and shall use conservative assumptions and parameters that are likely to underestimate, rather than overestimate, the GHG emission reductions or removals. *Note – The criteria set out in (2)-(6) above are targeted at more complex models. For simple models, certain of these criteria may not be appropriate, or necessary to the integrity of the methodology. Such criteria may be disregarded, though the onus is upon the methodology developer to demonstrate that they are not appropriate or necessary.*		5) The Model has to be calibrated/validated upon actual field measurements of water levels in discrete areas of the project boundary. Characteristics of the discrete areas are provided. The discrete area has to be chosen based on the accessibility to the sampling locations. Measurements have to be taken a minimum of 8 month covering the dry and the wet season at a frequency of at least once per month. **Corrective Actions Request 3.** The requirements for the validation of the SIMGRO model, as well as the validation of the peat thickness model need further specification: • Clarify how accessibility is defined • Clarify how the discrete area is defined • Clarify how the measurement arrangement shall be designed (how far/close to waterways etc.) • Clarify if 10 measurements are sufficient even for large scale projects. 6) No information about the conservative assumptions and parameters for the model to be applied are mentioned **Clarification Request 4.** Clarify how it is ensured that the application of the model rather lead to an underestimation than an overestimation of the GHG reductions and removals.		
In the case the VCS Program methodology uses default factors and standards to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, is the following applied:	1, 5, 18	1) Default factors and standards used meet the requirements of the VCS Standard. The peat subsidence rate suggested by the methodology can be judged conservative The peat emission factor suggested by the meth-	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
1) Where the methodology uses third party default factors and/or standards, such default factors and standards shall meet with the requirements for data set out in Section 4.5.6, *mutatis mutandis*. 2) Where the methodology itself establishes a default factor, the following applies: a) The data used to establish the default factor shall comply with the requirements for data set out in Section 4.5.6, *mutatis mutandis*. b) The methodology shall describe in detail the study or other method used to establish the default factor. c) The methodology developer shall identify default factors which may become out of date (i.e., those default factors that do not represent physical constants or otherwise would not be expected to change significantly over time). Such default factors are subject to periodic re-assessment, as set out in VCS document *Methodology Approval Process*. 3) Where methodologies allow project proponents to establish a project-specific factor, the methodology shall provide a procedure for establishing such factors.		odology is under discussion on the IPCC level. Nevertheless the mentioned default values are suggestions of the methodology and can be replaced by recently published applicable factors. See also CAR 4. 2) n.a. 3) n.a.		
In the case proxies are used, is it demonstrated that they are strongly correlated with the value of interest and that they can serve as an equivalent or better method (eg, in terms of reliability, consistency or practicality) to determine the value of interest than direct measurement of the value itself?	1, 19	The methodology uses the water level as proxy to estimate the baseline and project emissions via peat depletion rate and emissions factors. The water level is strongly correlated with the emissions calculated due to respective chemical process in aerobic/un-aerobic conditions. This approach is found to be adequate for peatland methodology	✓	✓
Does the VCS Program methodology use a standardized method (i.e., performance method or activity method) or a project method to determine additionality and/or the credit-	1	For the determination of the additionality and the baseline the methodology requires the application of a tool approved by the VCS.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
ing baseline, and does the VCS Program methodology state which type of method is used for each? *A project method is a methodological approach that uses a project-specific approach for the determination of additionality and/or crediting baseline.*		Thus, the methodology uses a project method to determine additionality and the crediting baseline.		
Methodologies may use any combination of project, performance or activity methods for determining additionality and the crediting baseline. Does the VCS Program methodology provide only one method (i.e., a project method or performance method) for determining the crediting baseline (i.e., methodologies shall not provide the option of using either a project method or a performance method for the crediting baseline)?	1	The methodology uses only a project method for determining the crediting baseline as required by the standard.	✓	✓
General requirements (AFOLU v3.4 Section 4.1)				
Are the standards and factors used by the VCS Program methodology to derive GHG emissions data as well as any supporting data for baseline scenarios and additionality publicly available and come from a reputable and recognized source, such as IPCC 2006 Guidelines for National GHG Inventories or the IPCC 2003 Good Practice Guidelines for Land Use, Land-Use Change and Forestry?	1, 5, 18	The factors used by the methodology are: Publicly available from a reputable and recognized source. Potential PPs are free to use default factors recently published and applicable for the project. **Corrective Actions Request 4.** Clarify how it is ensured that most recent scientific data for factors/standards to be applied is taken into account when estimating GHG emissions and removals.	**CAR**	✓
Eligible AFOLU Wetlands Restoration and Conservation (WRC) Category (AFOLU v3.4 Section 4.2)				
Do the applicability conditions of the VCS Program methodology allow WRC activities that increase net GHG removals by restoring wetland ecosystems or that reduce GHG emissions by rewetting or avoiding the degradation of wetlands? Does the VCS Program methodology require that the pro-	1	The applicability conditions allow WRC activities that increase net GHG removals by restoring wetland ecosystems The methodology requires that the project area meets an internationally accepted definition of ombrogenous tropical peatlands at an elevation less than 100 m	**CR**	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
ject area meets an internationally accepted definition of wetland, such as from the IPCC, Ramsar Convention on Wetlands, those established by law or national policy, or those with broad agreement in the peer-reviewed scientific literature for specific countries or types of wetlands? *Common wetland types include peatland, salt marsh, tidal freshwater marsh, mangroves, wet floodplain forests, prairie potholes and seagrass meadows. WRC activities may be combined with other AFOLU project categories, as further explained in Section 4.2.20 of the AFOLU requirements.*		above sea level within Southeast Asia, defined as Malaysia, Indonesia, Brunei or Papua New Guinea. **Clarification Request 5.** Provide the scientific study the methodology is referring to as definition of ombrogenous tropical peatlands the methodology is based on.		
Avoiding the degradation or conversion of a wetland can reduce GHG emissions by preventing the release of carbon stored in wetland soils and vegetation. Many wetlands rely on a natural supply of sediments to support soil formation. Sediment supply may be interrupted by a physical alteration to the landscape, such as a river diversion, canal construction or isolation of wetlands behind man-made structures (eg, road or rail embankments, levees or dams). *Restoring wetland ecosystems reduces and/or removes GHG emissions by creating the necessary physical, biological or chemical conditions that enhance carbon sequestration.* Do the applicability conditions of the VCS Program methodology allow activities that affect the hydrology of the project area and the changes in hydrology result in the accumulation or maintenance of soil carbon stock?	1	The methodology requires that project activities affect the hydrology of the project area. It is assumed, that, by affecting the hydrology soil carbon stock will be accumulate or maintained.	✓	✓
Does the VCS Program methodology fall under the AFOLU project category Wetlands Restoration and Conservation (WRC) / Resoring Wetland Ecosystems (RWE) as it includes: 1) Activities that reduce GHG emissions or increase carbon sequestration in a degraded wetland through restoration activities. Such activities include enhancing, creating and/or managing hydrological conditions, sediment supply, salinity characteristics, water quality	1	The methodology falls under the AFOLU project category Wetland Restoration and Conservation (WRC) / Restoring Wetland Ecosystems (RWE) as it aims to reduce net GHG emissions by reducing oxidation and decreasing the rate of peat subsidence through the establishment of a permanent higher water level on drained peatlands.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
and/or native plant communities. For the purpose of these requirements, restoration activities are those that result in the reestablishment of ecological processes, functions, and biotic and/or abiotic linkages that lead to persistent, resilient systems integrated within the landscape, noting the following: a) Restoration or management of water table depth (eg, the rewetting of peatlands, the reintroduction of river flows to floodplains, or the reintroduction of tidal flows to coastal wetlands) implies long-term and measurable changes in water table depth that sequester carbon and/or reduce emissions. Methodologies shall establish the appropriate change in water table depth (such as raising, lowering or restoring hydrological function) that is expected for eligible project activities, considering the following baseline scenario conditions: i. Drained wetlands have a water table depth that is lower than the natural average annual water table depth due to accelerated water loss or decreased water supply resulting from human activities and/or construction, either on- and/or off-site. Baseline activities include purposeful draining through pumping, ditching, stream channelization, levee construction, and purposeful decreases in water supply through dams and water diversions. Examples of this include selectively logged peatland swamp forests in Southeast Asia impacted by logging canals or wetlands with water tables lowered for agriculture. Activities shall raise the average annual water table depth in a drained wetland by partially or entirely reversing the existing drained state. Rewetting does				

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
not require the restoration of the average annual water table depth to the level of the soil or peat surface. However, RWE projects shall raise the water table depth close to the surface in order to be eligible to generate GHG credits. A clear relationship between GHG emissions and water table depth in wetlands, including peatlands[4] has been established in scientific literature with most changes in emissions occurring with water table depths close to the surface. This relationship is most dramatic on highly-organic soils (eg, peatland). On such sites, activities that establish a higher water table depth compared to the baseline scenario can be eligible where they measurably decrease the rate of soil subsidence due to oxidation to decrease or cease within the project crediting period, and where the permanence requirements set out in Section 4.5.27 can be satisfied. ii. Impounded wetlands have a water table that has been artificially raised, intentionally or unintentionally, as a result of impaired natural drainage behind a constructed feature and can result in CH_4 emissions. Examples of impounded wetlands include flooded areas behind artificial barriers to natural drainage (such as road or rail embankments or levees), flooded areas for the purpose of subsidence reversal, man-made reservoirs and fish and shrimp ponds. Activities that restore hydrological function to an impounded wetland or lower the water table depth shall restore hydrological flow, considering the dynamics of the system and the hydrological connectivity necessary to maintain carbon stock and GHG fluxes. iii. Open water is an area continuously flooded or sub-				

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
ject to natural periods of flooding, without in-situ vegetation contributing to soil carbon accumulation. Wetlands convert to open water in response to impaired sediment supply, sea level rise and/or impaired water quality. Activities that restore hydrological function to an open water wetland shall restore the hydrological flow, considering the dynamics of the system and the hydrological connectivity necessary to maintain carbon stock and GHG fluxes. b) RWE projects may generate GHG credits from the reduction of GHG emissions associated with avoiding peat fires on drained or partially drained peatlands. Fire-related activities on peatlands that exclude rewetting as part of the project are not eligible, because fire reduction activities on drained peatland are unlikely to be effective over the long term without rewetting.				
1. Sources				
Does the VCS Program methodology indicate key documents, methodologies and/or projects upon which the proposed methodology /revision is based? Are any modules or tools identified to which the methodology/revision refers? Is information on author of methodology/revision included, if desired?	1	The approach to stratify peat depletion time is based on the VCS Methodology VM0004. **<u>Corrective Actions Request 5.</u>** Ensure that all Tools referred to in the methodology are listed as required.	**CAR**	✓
2. Summary Description of the Methodology				
Does the VCS Program methodology provide a brief summary description of the methodology/revision, including the main methodological steps?	1	The methodology provides a brief summary description of: 1. Definition of the project boundaries 2. Stratification 3. Choice of the baseline scenario 4. Demonstration of additionality 5. Ex ante calculation of baseline GHG emis-	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
		sions 6. Calculation of ex ante GHG project emissions 7. Leakage emissions 8. Baseline and project monitoring. The main methodological steps are described. The descriptions match the explanations given in the sections that follow. Further it is briefly described what effects on greenhouse gas emissions projects applying the methodology will have.		
Does the VCS Program methodology indicate in the table below whether the methodology uses a project, performance or activity method for determining additionality, and a project or performance method for determining the crediting baseline (see the VCS Standard for further information on these methods)? Additionality: <Project/Performance/Activity Method> Crediting Baseline: <Project/Performance Method>	1	The methodology uses a project methodology to determine additionality and the crediting baseline. The table foreseen for the mentioned indication is used as required.	✓	✓
3. Definitions				
Does the VCS Program methodology provide definitions of key terms and acronyms that are used in the methodology/revision?	1	**Corrective Actions Request 6.** Ensure that all key terms and acronyms used in the methodology are listed as required.	**CAR**	✓
4. Applicability Conditions				
Applicability conditions (VCS v3.4 Section 4.3)				
Does the VCS Program methodology identify the project activities to which it applies?	1	The methodology clearly identifies that it applies to projects that rewet drained peatlands in south east Asia	✓	✓
Does the VCS Program methodology establish criteria that describe the conditions under which the methodology can (and cannot, if appropriate) be applied?	1	The methodology lists 22 applicability conditions under which the methodology is applicable	**CR**	✓

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		Clarification Request 6. Clarify if all applicability conditions listed are actually applicability conditions, considering that general VCS requirements do not need to be identified as applicability conditions in a methodology		
Does the VCS Program methodology apply any applicability conditions set out in tools or modules?	1	n.a.	**n.a.**	**n.a.**
5. Project Boundary				
Project boundary (VCS v3.4 Section 4.4)				
Does the VCS Program methodology include determination criteria or procedures for describing the project boundary?	1	The methodology distinguishes between geographic boundaries and temporal boundaries. As geographic boundaries the following have to be identified: 1. Watershed(s) of interest 2. Project area boundary 3. Excluded area of watershed(s) In subsequent sections the methodology provides criteria and procedures to identify the mentioned geographical boundaries: 1. Watershed(s) on interest have to be identified on basis of digital terrain models and thus the hydrological conditions of the area. 2. The Project area boundary has to be identified on land under control of the project proponent and on peatland identified via remote sensing imagery or a digital terrain model combined with a peat thickness model. 3. Excluded area of watershed has to be described according to a list of parameters to be collected. Temporal boundaries clarify the minimum of historic data on climate variables (20 years), the project credit-	✓	✓

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		ing period (20 – 100 years) and the monitoring period (1 – 10 years). Further it is requested, that the baseline emissions have to be revised at verification or latest every 10 years.		
Does the VCS Program methodology include determination criteria or procedures for identifying and assessing GHG sources, sinks and reservoirs relevant to the project (controlled by the project proponent, related to the project or affected by the project) and the baseline scenarios?	1	The methodology provides procedures for identifying and assessing GHG sources, sinks and reservoirs relevant to the project activity and the baseline scenario. For the baseline scenario CO_2 emissions, for the project activity CO_2, N_2O and CH_4 from peat oxidation are listed The mentioned GHG sources are assessed on basis of the water level in the area modelled with the SIMGRO model and respective emission factors and the peat depletion rate.	✓	✓
Does the VCS Program methodology give a justification for GHG sources, sinks and reservoirs included or excluded?	1	The methodology gives plausible justifications for the GHGs selected. **Corrective Actions Request 7.** Provide a justification/ explanation for CH_4 from the project activity.	**CAR**	✓
In identifying GHG sources, sinks and reservoirs relevant to the project does the VCS Program methodology set out criteria and procedures for identifying and assessing GHG sources, sinks and reservoirs that are controlled by the project proponent, related to the project or affected by the project (i.e., leakage)?	1	The methodology provided and explains possible sources of leakage in Section 8.3. See also comments regarding leakage below in section 8.3. of the checklist.	✓	✓
In identifying GHG sources, sinks and reservoirs relevant to the baseline scenario, does the VCS Program methodology: 1) Set out criteria and procedures used for identifying the GHG sources, sinks and reservoirs relevant for the project? 2) Where necessary, explain and apply additional criteria	1	Requirements 1) and 2) see comments above. The methodology compares the sources of GHGs by using the table provided by the Methodology template v3.1 in order to list the source of the GHGs and the GHGs accounted for in the baseline scenario and the project activity.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
for identifying relevant baseline GHG sources, sinks and reservoirs? 3) Compare the GHG sources, sinks and reservoirs identified for the project with those identified in the baseline scenario, to ensure equivalency and consistency?				
B 3 Project Boundary (AFOLU v3.4 Section 4.3)				
Does the VCS Program methodology include the relevant carbon pools as per VCS requirement? Aboveground tree biomass: Y Above-ground non-tree biomass: O Below-ground biomass: O Litter: N Dead wood: O Soil: Y Wood products: O *Y: Carbon pool shall be included.* *S: Carbon pool shall be included when significant* *N: Carbon pool does not have to be included,* *O: Carbon pool is optional*	1	The methodology includes aboveground tree biomass and soil in line with the VCS requirement for PRC methodologies.	✓	✓
Does the VCS Program methodology establish the criteria and procedures by which a pool or GHG source may be determined to be de minimis (less than 5% of total GHG benefit)? *For example, peer reviewed literature or the CDM A/R methodological tool for testing significance of GHG emissions in A/R CDM project activities may be used to determine whether decreases in carbon pools and increases in GHG emissions are de minimis* *Further, the following GHG sources may be deemed de minimis and need not be accounted for:*	1	The methodology doesn't provide criteria and procedures by which a pool of GHG source may be determined to be de minimis.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
*2) ARR, IFM, REDD, ACoGS and **WRC**: GHG emissions from the removal or burning of herbaceous vegetation and collection of non-renewable wood sources for fencing of the project area.* *3) ARR, IFM, REDD, ACoGS and **WRC**: Fossil fuel combustion from transport and machinery use in project activities. Where machinery use for selective harvesting activities may be significant in IFM project activities as compared to the baseline or where machinery use for earth moving activities may be significant in WRC project activities as compared to the baseline, emissions shall be accounted for if above de minimis, in accordance with this Section 4.3.3. Fossil fuel combustion from transport and machinery use in rewetting of drained peatland and conservation of peatland project activities need not be accounted for.*				
Does the VCS Program methodology establish criteria and procedures by which a project proponent may determine a carbon pool or GHG source to be conservatively excluded? *Specific carbon pools and GHG sources do not have to be accounted for if their exclusion leads to conservative estimates of the total GHG emission reductions or removals generated.*	1	The methodology considers emissions of CH_4 negligible in the baseline. Also N_2O emissions are conservatively not accounted for.	✓	✓
Reductions of N_2O and/or CH_4 emissions are eligible for crediting if in the baseline scenario the project area would have been subject to livestock grazing, rice cultivation, burning and/or nitrogen fertilization.	1	n.a.	**n.a**	**n.a**
Reductions of CH_4 emissions are eligible for crediting if fire would have been used to clear the land in the baseline scenario.	1	n.a.	**n.a**	**n.a**
Does the VCS Program methodology include CH_4 emissions in the project boundary?	1	The methodology includes CH_4 emissions in the project scenario.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
As transient peaks of CH_4 may arise after rewetting peatland.				
Does the VCS Program methodology establish the criteria and procedures by which the CH4 source may be deemed de minimis or conservatively excluded (*see also requirements above*)?	1	See comments above	✓	✓
Does the VCS Program methodology establish the criteria and procedures by which the N_2O source may be deemed de minimis or conservatively excluded (see also requirements above)? *For RWE projects, N_2O emissions shall be included in the project boundary.*	1	See comments above	✓	✓
6. Procedures for Determining the baseline scenario				
Baseline Scenario (VCS v3.4 Section 4.5)				
Does the VCS Program methodology establish criteria and procedures for identifying alternative baseline scenarios and determining the most plausible scenario, taking into account: 1) The identified GHG sources, sinks and reservoirs. 2) Existing and alternative project types, activities and technologies providing equivalent type and level of activity of products or services to the project. 3) Data availability, reliability and limitations. 4) Other relevant information concerning present or future conditions, such as legislative, technical, economic, socio-cultural, environmental, geographic, site-specific and temporal assumptions or projections?	1	The methodology requires the application of the most recent version of the VCS Tool: “Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities” for identifying the potential alternative baseline land use scenarios in the project boundary	✓	✓
Baseline Scenario (AFOLU v3.4 Section 4.4)				
Does the VCS Program methodology follow an internationally accepted GHG inventory protocol, such as the IPCC 2006 Guidelines for National GHG Inventories when determining and establishing a baseline scenario?	1	See comment above	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
Do the criteria and procedures identified by the VCS program methodology for identifying alternative RWE baseline scenarios take into account: 1) The current and historic hydrological characteristics of the watershed or coastal plain, and the drainage system in which the project occurs. 2) The long-term average climate variables influencing water table depths and the timing and quantity of water flow. The long-term average climate variables shall be determined using data from climate stations that are representative of the project area and shall include at least 20 years of data. 3) Planned water management activities (such as dam construction)?	1	The methodology requires the application of the VCS Tool: "Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities". Further does the methodology provide an applicability matrix guiding project proponents through five questions ensuring that in the end the most plausible baseline scenario is that the project boundary is drained and will remain drained in the absence of the project. The matrix respectively the SIMGRO model to be applied ensure that: 1) The current and historic hydrological characteristics of the watershed of interest and its drainage system have to be modelled by applying the SIMGRO model. 2) The use of at least 20 years of data of the climate variables influencing water table depth and the timing and quantity of water flow is obligatory when preparing the SIMGRO model. The source of the data has to be representative for the watershed of interest. 3) PPs are obligated to demonstrate that planed water management activities do not change by providing respective information in terms of permissibility, common practice and/or existing management and budget plans.	✓	✓
Do the criteria and procedures identified by the VCS program methodology for identifying alternative RWE baseline scenarios also consider relevant non-human induced rewetting brought about by: 1) Collapsing dikes or ditches that would have naturally	1, 14, 15	1) The SIMGRO model that has to be applied allows modelling the expected rate of natural damming of waterways. Project proponents have to collect natural damming evidences (water flow, mud sedimentation within water flow, weed growth within flow of waterways and natural damming)	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
failed over time without their continued maintenance. 2) Progressive subsidence of deltas or peatlands leading to a rise in relative water table depths, thus reducing CO_2 emissions but possibly increasing CH_4 emissions in freshwater systems. 3) Non-human induced elevation of non-vegetated wetlands to build vegetated wetlands. Deltaic systems with high sediment load from rivers often do this naturally, and this should be counted as part of the baseline?		while collecting data to delineate existing waterways. 2) not applicable in ombrogenous wetlands as defined in the methodology 3) not applicable in ombrogenous wetlands as defined in the methodology		
Do the criteria and procedures identified by the VCS program methodology for identifying fire in the baseline scenario require: • to demonstrate with fire maps and historical databases on fires that the project area is now and in future would be under risk of anthropogenic fires? • to consider any relevant current and planned land use conditions that may affect the occurrence of fire in order to establish the most plausible scenario for fire in the baseline.	1	**Corrective Actions Request 8.** • Clarify if the methodology requires identifying fire in the baseline scenario (frequency, intensity and extent)? • Clarify how the methodology considers any relevant current and planned land use that may affect the occurrence of fire?	**CAR**	✓
Many land use activities on wetlands (eg, aquaculture and agriculture) involve the exposure of wetland soils to aerobic decomposition through piling, dredging (expansion of existing channels) or channelization (cutting through wetland plains). Where relevant, WRC baseline scenarios shall account for such processes as they expose disturbed carbon stocks to aerobic decomposition thus increasing the rate of organic matter decomposition and GHG emissions that may continue for years from the stockpiles. Does the VCS Program methodology include credible methods for quantifying and forecasting GHG emissions from such degradation?	1	Activities involving the exposure of wetland soils to aerobic decomposition are not allowed by the applicability conditions defined by the methodology	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
Where relevant, are PPs required to take account of hydrological processes that lead to increased carbon burial and GHG reductions within the project area when identifying the WRC baseline scenarios? *Such processes include changes in the landscape form (ie, construction of levees to constrain flow and flooding patterns or dams to hold water) and changes in land surface (i.e., forest clearing, and ditching or paving leading to intensified run-off).*	1, 14, 15	By applying the SIMGRO model, PPs are required to have to collect natural damming evidences (water flow, mud sedimentation within water flow, weed growth within flow of waterways and natural damming) and thus will model the drainage depth per month for each year.	✓	✓
Where relevant, are PPs required to take account of processes within the project area that reduce sediment supply associated with changes in the landscape (e.g., construction of upstream dams or stabilization of eroding *feeder* cliffs along the coast) when identifying the WRC baseline scenario? *The supply of sediment varies over time and the time-averaged delivery of sediment shall be considered.*	1	Not applicable in ombrogenous wetlands as defined in the methodology	✓	✓
Where relevant, does the VCS Program methodology establish criteria and procedures for identifying wetland erosion and/or migration resulting from sea level rise in the baseline scenario on the basis of wetland maps, historical trend data, future projection of sea level rise and how changes in management would impact carbon stocks.	1	Not applicable in ombrogenous wetlands as defined in the methodology	✓	✓
Where relevant, do the criteria and procedures identified by the VCS program methodology for identifying alternative baseline scenarios require the project proponent to take into account current and historic management activities outside the project area that have significantly impacted or may significantly impact the project area, including the following: 1) Disruption to or improvement of natural sediment delivery, as this will alter the rate and magnitude of coastal wetlands response to sea level rise.	1	Not applicable in ombrogenous wetlands as defined in the methodology	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
2) Upstream dam construction, as this will alter water and sediment delivery, as well as salinity in coastal lowlands. 3) Construction of infrastructure inland of coastal wetlands, as this will impair wetland capacity to migrate landwards with sea level rise. 4) Construction of coastal infrastructure, as this can impair sediment movement along shorelines causing wetland loss and increasing risk of carbon emissions with sea level rise.				
7. Procedure for demonstrating additionality				
A 5 Additionality (VCS v3.4 Section 4.6)				
Does the VCS Program methodology assess additionality by doing one of the following: 1) Referencing and requiring the use of an appropriate additionality tool that has been approved under the VCS or an approved GHG program; 2) Developing a full and detailed procedure for demonstrating and assessing additionality directly within the methodology; or 3) Developing a full and detailed procedure for demonstrating and assessing additionality in a separate tool, which shall be approved via the methodology approval process, and referencing and requiring the use of such new tool in the methodology?	1	The methodology requires the application of the most recent version of the VCS Tool: "Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities" for demonstrating and assessing additionality.	✓	✓
8. Quantification of GHG emissions and removals				
Quantification of GHG emission reduction and removals (VCS v3.4 Section 4.7)				

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Does the VCS Program methodology establish criteria and procedures for quantifying GHG emissions and/or removals and/or carbon stocks, for the selected GHG sources, sinks and/or reservoirs, separately for the project (including leakage) and baseline scenarios?	1	The methodology requires the application of the SIM-GRO model as basis for quantifying GHG emissions and removals for the selected GHG sources for the baseline scenario and the project. To quantify emissions from leakage the methodology provides criteria and procedures. For further details see comments below	✓	✓
8.1 Baseline emissions				
B 5 Baseline and Project Emissions/Removals (AFOLU v3.4 Section 4.5)				
Does the VCS Program methodology establish procedures to quantify the GHG emissions or removals for the baseline scenario? Does the VCS Program methodology use The IPCC 2006 Guidelines for National GHG Inventories or the IPCC 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry as guidance for quantifying increases or decreases in carbon stocks and GHG emissions? Does the VCS Program methodology require to follow the IPCC Guidelines in terms of quality assurance/quality control (QA/QC) and uncertainty analysis? *The IPCC 2006 Guidelines for National GHG Inventories may be referenced to establish procedures for quantifying GHG emissions/removals associated with the following carbon pools including:* *1) Litter;* *2) Dead wood;* *3) Soil (methodologies may follow the IPCC guidelines for the inclusion of soil carbon, including the guidelines that are in sections not related to forest lands); and* *4) Belowground biomass (estimated using species-dependent root-to-shoot ratios, the Mokany et al. ratios and*	1	Baseline determination and establishment is based on protocols in IPCC 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry Chapter 4 Supplementary Methods and Good Practice Guidance arising from the Kyoto Protocol. Estimations of increases and decreases in carbon stocks, quality assurance/quality control measures, and uncertainty analysis is based on protocols in IPCC 2006 Chapter 7 Wetlands	✓	✓

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equations, or the Cairns equations).				
Where carbon would have been lost in the baseline scenario due to land use conversion or disturbance, GHG emissions from soil carbon, belowground biomass, wood products and dead wood carbon pools generally occur over a period of time following the event. It shall not be assumed that all GHG emissions from these carbon pools in the project categories specified below occur instantaneously or within a short period of time. Does the VCS Program methodology set out criteria and procedures to reliably establish the pattern of carbon loss over time using empirical evidence, such as studies that use primary data or locally calibrated models, or does the VCS Program methodology apply an appropriate decay model (such as a linear or exponential decay function) that is scientifically sound, based on empirical evidence and not likely to overestimate early carbon losses?	1	The methodology requires the application of the SIM-GRO model as basis for quantifying GHG emissions and removals for the selected GHG sources for the baseline scenario and the project.	✓	✓
Where appropriate, belowground biomass, soil carbon and dead wood decay models shall be calibrated. Where models are calibrated using measurement plots or data from research plots does the VCS Program methodology require sound and reliable measurement methods to be applied (as set out in Section 4.8.3.)?	1	n.a.	**n.a.**	**n.a.**
As the Soil carbon pool is included in the project boundary, does the VCS Program methodology opt to comply with the requirement to establish a pattern of carbon loss over time by incorporating the following procedure: 3) Is the pattern of carbon loss modeled based upon a 20-year linear decay function, taking into account the depth of affected soil layers and the total portion of the pool that would have been lost?	1	n.a.	**n.a.**	**n.a.**

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Does the VCS Program methodology establish criteria and procedures for quantifying GHG emissions/removals in the baseline scenario that: 1) For WRC activities on peatland the peat depletion time (PDT) shall be included in the quantification of GHG emissions and removals in the baseline scenario, and for non-peat wetlands, the soil organic carbon depletion time (SDT) shall be included in the quantification of GHG emissions and removals in the baseline scenario, noting the following: a) PDT is the time it would have taken for the peat to be completely lost due to oxidation or other losses, or for the peat depth to reach a level where no further oxidation or other losses occur. No GHG emission reductions may be claimed for a given area of peatland for longer than the PDT. The procedure for determining the PDT shall conservatively consider peat depth and oxidation rate within the project boundary and may be estimated based on the relationship between water table depth, subsidence (eg, using peat loss and water table depth relationships established in scientific literature), and peat depth in the project area. The PDT is considered part of the baseline and thus shall be reassessed with the baseline in accordance with Section 3.1.10. b) SDT is the time it would have taken for the soil organic carbon to be lost due to oxidation or to reach a steady stock where no further losses occur. No GHG emissions reductions may be claimed for a given area of wetland for longer than the SDT. The procedure for determining the SDT shall conserva-	1	The methodology requires: 1) PDT as to be calculated with a subsistence rate of 1.58 cm yr^{-1} or most recently published applicable rates based on a peat thickness model. The project area is stratified by the calculated PDT PDT has to be reassessed at every verification event. 2) Water levels have to be estimated by application of the SIMGRO model. A correction of the relative water level to the surface due to peat subsidence has to be calculated 3) Net baseline GHG emissions are based on the parameters/values estimated as described in 1) and 2). N_20 emissions as the activities will not necessarily rewet the peat to the surface and CH_4 emissions due to the rewetting of the peat will be calculated on basis of emissions factors and the model described in 2) Carbon stocks in AGB are conservatively set 0 as it is expected that under baseline conditions the AGB will decrease or stay stable due to burning activities or lower water tables.	✓	✓

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tively consider soil organic carbon content and oxidation rate within the project boundary and may be estimated based on the relationship between water table depth and soil organic carbon content in the project area. Where wetland soils are subject to sedimentation or erosion, the procedure for determining the SDT shall conservatively account for the associated gain or loss of soil organic carbon. This assessment is not mandatory in cases where soil organic carbon content on average may be deemed *de minimis* as set out in Section 4.3.3. 2) Any applicable and justifiable proxies, as established in scientific literature, for GHG emissions projected throughout the project crediting period shall be estimated. 3) Net baseline GHG emissions during the project crediting period, including emissions associated with the estimated water table depths, salinity or another justifiable proxy for GHG emissions, plus emissions from other activities such as biomass loss or fires, as well as carbon sequestration, where applicable, shall be estimated.				
Does the VCS Program methodology require to estimate the Baseline emissions conservatively and to consider that the water table depth in the project area may rise during the project crediting period due to any or all of the causes identified in alternative baseline scenarios as set out in Section 4.4.11. of the AFOLU Requirements?	1	The estimation of the baseline emissions are linked to the modelling of the water level via SIMGRO model. The SIMGRO model is based on data characterising the waterways in terms of flow of water, growth of vegetation and sedimentation for the area of the watershed(s). The model will e.g. predict non-human induced damming for the baseline scenario. Further the baseline has to be reassessed at a minimum every 10 years. By doing so, major drivers and patterns of agents that cause changes in hydrology and/or land and water management practices in the watershed(s) of interest have to be reassessed.	✓	✓

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The procedure for quantifying CO2 emissions for the baseline emissions may be estimated through hydrological modeling or the modeling of proxies for GHG emissions in place of direct on-site gas flux measurements. The procedure may include estimation through well-documented relationships between CO2 emissions and other variables such as vegetation types, water level or subsidence, or remote sensing techniques that adequately assess and monitor soil moisture. Because of the dominant relationship between water level and CO2 emissions, drainage depth can be used as a proxy for CO2 emissions in the absence of emissions data. Where relevant, does the VCS Program methodology require that the micro-topography of the project area (i.e., the proportion of hummocks and hollows and vegetation patterns) is considered?	1, 16	The methodology requires the elaboration of a digital terrain model (DTM) on bases either of LiDAR or Radar. For the DTMs based on Radar a correction of the model for the vegetation height is required.	✓	✓
Does the VCS Program methodology calculate net GHG emissions reductions using the same methods that are used for the baseline estimates, but using monitored data.	1	Emission reductions from the project activity are estimated the same way as for the baseline scenario on bases on modelled (SIMGRO) water levels in the project area. The model is based on the waterways and drainage system in the project area. The model has to be validated on bases of measured water levels.	✓	✓
Where relevant, does the VCS Program methodology assess the fate of transported organic matter as a result of sedimentation, erosion and oxidation conservatively based on peer-reviewed literature and considering the following: 1) It is conservative to not account for the loss of sediment from the project area in the baseline scenario. 2) It is conservative to not account for further sedimentation in the project area in the project scenario. Where	1	n.a.	✓	✓

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soil carbon is included in the project boundary, sedimentation shall be accounted for so that carbon sequestration resulting from the growth of vegetation can be estimated separately from carbon accumulated in sedimentation. In the absence of the project activity, such high carbon silt would be washed out to sea and would not have been emitted in the baseline and as such carbon accumulated in sedimentation is not eligible for crediting				
With respect to the soil carbon pool, the maximum quantity of GHG emission reductions that may be claimed by the project shall not exceed the net GHG benefit generated by the project 100 years after its start date. This limit is established because in wetlands remaining partially drained or not fully rewetted, or where drainage continues, the soil carbon will continue to erode and/or oxidize leading to GHG emissions and eventually depletion of the soil carbon. To determine this long-term net GHG benefit, projects shall estimate the remaining soil carbon stock adjusted for any project emissions and leakage emissions in both the baseline and project scenarios at the 100-year mark, taking into account uncertainties in modeling and using verifiable assumptions. Projects with a PDT or SDT in the project scenario of less than 100 years or unable to establish and demonstrate a significant difference in the net GHG benefit between the baseline and project for at least 100 years are not eligible for crediting of the soil carbon pool. Does the VCS Program methodology require to establish and demonstrate a significant difference in the net GHG benefit between the baseline and project for at least 100 years?	1	The applicability conditions of the methodology require a significant difference in the net GHG benefit between the baseline and project scenarios for at least 100 years **<u>Clarification Request 7.</u>** Specify how “significant differences” can be identified	**CR**	✓
Emissions of CH_4 from drained or saline wetlands may be excluded in the baseline scenario where it may be deemed de minimis (as set out in Section 4.3.3 of the AFOLU requirement) or conservatively excluded (as set out in Section	1	*Emissions of CH_4* in the baseline scenario are excluded	✓	✓

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4.3.4 of the AFOLU requirement)				
As WRC activities are likely to influence CH_4 emissions, does the VCS Program methodology establish procedures to estimate such emissions, and establish the criteria and procedures by which the source may be deemed de minimis (as set out in Section 4.3.3) or conservatively excluded (as set out in Section 4.3.4)? Where relevant, does the VCS Program methodology consider the micro-topography of the project area (ie, the proportion of hummocks and hollows and vegetation patterns)?	1	The methodology provides procedures to estimate CH_4 emissions. CH_4 emissions are not deemed de minimis.	✓	✓
Does the VCS Program methodology in case of RWE projects on peatland that include an activity designed specifically to reduce incidence and severity of fires deduct the amount of peat assumed to burn when estimating peat depletion times? *Where peat depletion times are estimated based only on oxidation rates due to drainage, the outcome would be a longer period than when first subtracting the amount of peat that is considered to burn in the baseline.*	1	n.a.	**n.a.**	**n.a.**
Does the VCS Program methodology in case of RWE projects on peatland explicitly addressing anthropogenic peatland fires occurring in drained peatlands establish procedures for determining or conservatively estimating the baseline emissions from peatland fire occurring in the project area using defensible data (such as fire maps, historical databases on fires, and where appropriate, combined with temperature and precipitation data)? *Methods for estimating GHG emissions from fire may be based on the IPCC 2006 Guidelines for National GHG Inventories, or other methods based on scientific, peer-reviewed literature.*	1	*See CAR 8.*	✓	✓
Where relevant, does the VCS Program methodology establish procedures to account for any changes in carbon	1	Not applicable in ombrogenous wetlands as defined in the methodology	✓	✓

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sequestration or GHG emission reductions resulting from lateral movement of wetlands due to sea level rise, or coastal squeeze associated with any structures that prevent wetland landward migration and cause soil erosion?				
8.2 Project emissions / removals				
Baseline and Project Emissions/Removals (AFOLU v3.4 Section 4.5)				
Does the VCS Program methodology establish procedures to quantify the GHG emissions or removals for the baseline scenario? Does the VCS Program methodology use The IPCC 2006 Guidelines for National GHG Inventories or the IPCC 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry as guidance for quantifying increases or decreases in carbon stocks and GHG emissions? Does the VCS Program methodology require to follow the IPCC Guidelines in terms of quality assurance/quality control (QA/QC) and uncertainty analysis? *The IPCC 2006 Guidelines for National GHG Inventories may be referenced to establish procedures for quantifying GHG emissions/removals associated with the following carbon pools including:* *1) Litter;* *2) Dead wood;* *3) Soil (methodologies may follow the IPCC guidelines for the inclusion of soil carbon, including the guidelines that are in sections not related to forest lands); and* *4) Belowground biomass (estimated using species-dependent root-to-shoot ratios, the Mokany et al. ratios and equations, or the Cairns equations).*	1	Baseline determination and establishment is based on protocols in IPCC 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry Chapter 4 Supplementary Methods and Good Practice Guidance arising from the Kyoto Protocol. Estimations of increases and decreases in carbon stocks, quality assurance/quality control measures, and uncertainty analysis is based on protocols in IPCC 2006 Chapter 7 Wetlands	✓	✓
Where carbon would have been lost in the baseline scena-	1	The methodology requires the application of the SIM-	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
rio due to land use conversion or disturbance, GHG emissions from soil carbon, belowground biomass, wood products and dead wood carbon pools generally occur over a period of time following the event. It shall not be assumed that all GHG emissions from these carbon pools in the project categories specified below occur instantaneously or within a short period of time. Does the VCS Program methodology set out criteria and procedures to reliably establish the pattern of carbon loss over time using empirical evidence, such as studies that use primary data or locally calibrated models, or does the VCS Program methodology apply an appropriate decay model (such as a linear or exponential decay function) that is scientifically sound, based on empirical evidence and not likely to overestimate early carbon losses?		GRO model as basis for quantifying GHG emissions and removals for the selected GHG sources for the baseline scenario and the project.		
Where appropriate, belowground biomass, soil carbon and dead wood decay models shall be calibrated. Where models are calibrated using measurement plots or data from research plots does the VCS Program methodology require sound and reliable measurement methods to be applied (as set out in Section 4.8.3.)?	1	n.a.	**n.a.**	**n.a.**
As the Soil carbon pool is included in the project boundary, does the VCS Program methodology opt to comply with the requirement to establish a pattern of carbon loss over time by incorporating the following procedure: 3) Is the pattern of carbon loss modeled based upon a 20-year linear decay function, taking into account the depth of affected soil layers and the total portion of the pool that would have been lost?	1	n.a.	**n.a.**	**n.a.**
The procedure for quantifying CO2 emissions for the baseline emissions may be estimated through hydrological modeling or the modeling of proxies for GHG emissions in place of direct on-site gas flux measurements. The procedure	1, 16	The methodology requires the elaboration of a digital terrain model (DTM) on bases either of LiDAR or Radar. For the DTMs based on Radar a correction of the model for the vegetation height is required.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
may include estimation through well-documented relationships between CO2 emissions and other variables such as vegetation types, water level or subsidence, or remote sensing techniques that adequately assess and monitor soil moisture. Because of the dominant relationship between water level and CO2 emissions, drainage depth can be used as a proxy for CO2 emissions in the absence of emissions data. Where relevant, does the VCS Program methodology require that the micro-topography of the project area (i.e., the proportion of hummocks and hollows and vegetation patterns) is considered?				
Does the VCS Program methodology calculate net GHG emissions reductions using the same methods that are used for the baseline estimates, but using monitored data.	1	Emission reductions from the project activity are estimated the same way as for the baseline scenario on bases on modelled (SIMGRO) water levels in the project area. The model is based on the waterways and drainage system in the project area. The model has to be validated on bases of measured water levels.	✓	✓
Where relevant, does the VCS Program methodology assess the fate of transported organic matter as a result of sedimentation, erosion and oxidation conservatively based on peer-reviewed literature and considering the following: 3) It is conservative to not account for the loss of sediment from the project area in the baseline scenario. 4) It is conservative to not account for further sedimentation in the project area in the project scenario. Where soil carbon is included in the project boundary, sedimentation shall be accounted for so that carbon sequestration resulting from the growth of vegetation can be estimated separately from carbon accumulated in	1	n.a.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
sedimentation. In the absence of the project activity, such high carbon silt would be washed out to sea and would not have been emitted in the baseline and as such carbon accumulated in sedimentation is not eligible for crediting				
With respect to the soil carbon pool, the maximum quantity of GHG emission reductions that may be claimed by the project shall not exceed the net GHG benefit generated by the project 100 years after its start date. This limit is established because in wetlands remaining partially drained or not fully rewetted, or where drainage continues, the soil carbon will continue to erode and/or oxidize leading to GHG emissions and eventually depletion of the soil carbon. To determine this long-term net GHG benefit, projects shall estimate the remaining soil carbon stock adjusted for any project emissions and leakage emissions in both the baseline and project scenarios at the 100-year mark, taking into account uncertainties in modeling and using verifiable assumptions. Projects with a PDT or SDT in the project scenario of less than 100 years or unable to establish and demonstrate a significant difference in the net GHG benefit between the baseline and project for at least 100 years are not eligible for crediting of the soil carbon pool. Does the VCS Program methodology require to establish and demonstrate a significant difference in the net GHG benefit between the baseline and project for at least 100 years?	1	The applicability conditions of the methodology require a significant difference in the net GHG benefit between the baseline and project scenarios for at least 100 years. See also comments above.	✓	✓
Emissions of CH4 from drained or saline wetlands may be excluded in the baseline scenario where it may be deemed de minimis (as set out in Section 4.3.3 of the AFOLU requirement) or conservatively excluded (as set out in Section 4.3.4 of the AFOLU requirement)	1	*Emissions of CH_4* in the baseline scenario are excluded	✓	✓
As WRC activities are likely to influence CH4 emissions, does the VCS Program methodology establish procedures to estimate such emissions, and establish the criteria and	1	The methodology provides procedures to estimate CH_4 emissions. CH_4 emissions are not deemed de minimis.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
procedures by which the source may be deemed de minimis (as set out in Section 4.3.3) or conservatively excluded (as set out in Section 4.3.4)? Where relevant, does the VCS Program methodology consider the micro-topography of the project area (ie, the proportion of hummocks and hollows and vegetation patterns)?				
Does the VCS Program methodology in case of RWE projects on peatland that include an activity designed specifically to reduce incidence and severity of fires deduct the amount of peat assumed to burn when estimating peat depletion times? *Where peat depletion times are estimated based only on oxidation rates due to drainage, the outcome would be a longer period than when first subtracting the amount of peat that is considered to burn in the baseline.*	1	n.a.	**n.a.**	**n.a.**
Does the VCS Program methodology in case of RWE projects on peatland explicitly addressing anthropogenic peatland fires occurring in drained peatlands establish procedures for determining or conservatively estimating the baseline emissions from peatland fire occurring in the project area using defensible data (such as fire maps, historical databases on fires, and where appropriate, combined with temperature and precipitation data)? *Methods for estimating GHG emissions from fire may be based on the IPCC 2006 Guidelines for National GHG Inventories, or other methods based on scientific, peer-reviewed literature.*	1	See comments above	✓	✓
Where relevant, does the VCS Program methodology establish procedures to account for any changes in carbon sequestration or GHG emission reductions resulting from lateral movement of wetlands due to sea level rise, or coastal squeeze associated with any structures that prevent wetland landward migration and cause soil erosion?	1	See comments above	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
8.3 Leakage				
Leakage (AFOLU v3.4 Section 4.6)				
Does the VCS Program methodology establish procedures to quantify all significant sources of leakage? 1) Market leakage occurs when projects significantly reduce the production of a commodity causing a change in the supply and market demand equilibrium that results in a shift of production elsewhere to make up for the lost supply. *Projects shall account for market leakage where the production of a commodity (eg, timber) is significantly affected by the project.* 2) Activity shifting leakage occurs when the actual agent of deforestation and/or forest of wetland degradation moves to an area outside of the project boundary and continues its deforestation activities elsewhere. 3) Ecological leakage occurs in WRC projects where a project activity causes changes in GHG emissions or fluxes of GHG emissions from ecosystems that are hydrologically connected to the project area.	1	The methodology establishes procedures to quantify leakage: 1) Market leakage is not accounted for. For details see comments below 2) Leakage due to activity displacement is accounted for due to illegal degradation activities. The estimation is based on PRAs clarifying the potential of degradation inside the project area and in surrounding areas and the identification of the area of potential degradation activities as well as the estimation of the emission of such activities. The estimation of the emission is based on default values taken from scientific literature. 3) The methodology accounts for ecological leakage in the excluded areas of the watershed on bases of the respective areas and IPCC default emission factors for rewetted peatlands. See also comments below. **<u>Corrective Actions Request 9.</u>** Clarify why leakage "LK CH_4" is not mentioned in lines 1152/1153	**CAR**	✓
Does the VCS Program methodology determine GHG emissions from leakage directly from monitoring, or indirectly when leakage is difficult to monitor directly but where scientific knowledge provides credible estimates of likely impact?	1	The methodology determines GHG emissions on bases of scientific knowledge that provides credible estimates and monitoring. See also comments above and below.	✓	✓
Does the VCS Program methodology require that Projects account for market leakage in cases where the production	1	Illegal logging activities are not included in the project baseline thus in line with the requirements the meth-	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
of a commodity (e.g., timber, aquacultural products or agricultural products) is significantly affected by the project? *The significance of timber production is determined as set out in Section 4.3.3 above or as set out in Section 4.6.15.*		odology does not require to account for market leakage.		
Does the VCS Program methodology quantify leakage occurring outside the host country (international leakage)? *International leakage does not need to be quantified.*	1	The methodology does not quantify leakage outside the host country	✓	✓
In case of leakage mitigation measures including tree planting, aquacultural intensification, agricultural intensification, fertilization, fodder production, and/or other measures to enhance cropland and/or grazing land areas,, leakage management zones or a combination of these does the VCS Program methodology account for any significant increase in GHG emissions associated with these activities, unless deemed *de minimis* (as set out in Section 4.3.3 AFOLU v3.2) or can be conservatively excluded (as set out in Section 4.3.4 AFOLU v3.2)?	1	n.a.	**n.a.**	**n.a.**
Does the VCS Program methodology account for positive leakage? *Projects shall not account for positive leakage (i.e., where GHG emissions decrease or removals increase outside the project area due to project activities).*	1	The methodology does not account for positive leakage	✓	✓
RWE projects involving rewetting of forested wetlands are likely to reduce the productivity of the forest or make harvesting more difficult, which could lead to fewer forest products and thus result in leakage (ie, GHG emissions from logging and drainage elsewhere). In case the VCS Program methodology allows projects to	1	The applicability conditions do not allow any displacement of land use activities from inside the project boundaries except of potential illegal selective logging activities. The methodology accounts for potential illegal activity-shifting on basis of PRA based monitoring of such activities.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
result in activity shifting of forest products are the applicable requirements for leakage in IFM or REDD project activities followed, accounting for both activity-shifting and/or market leakage? In case the VCS Program methodology allows projects to result in the shifting of drainage activities or other activities that would lower the water table, are the expected GHG emissions from a lower water table also accounted for? Does the VCS Program methodology require that in case of RWE projects on peatland to assume that the PDT of leakage activities occurs over the length of the project crediting period if the PDT is longer than the project crediting period?		See also comments above		
Rewetting in the project area may lead to higher water table depths in some areas beyond the project boundary, and consequently leading to lower water table depths in downstream areas further beyond the project boundary (eg, in the case of project activities that reverse subsidence), or cause transportation of organic matter to areas beyond the project boundary. In such cases, does the VCS Program methodology require the project proponent to demonstrate that such changes in water table depths or export caused by the project do not lead to increases in GHG emissions outside the project area, or to identify the affected areas and to quantify and to account for the resulting leakage?	1	The methodology requires modelling the water level in the watershed(s) of interest. Thus it is ensured that the water level beyond the actual project area is taken into account. Further, it can be expected that activities of ombrogenous wetlands as defined in the methodology will absorb the climatically induced peaks of high and low water levels of nearby rivers as an intact peatlands ensures a permanent supply with water.	✓	✓
In case of the wetland restoration project includes fire reduction activities, does the VCS Program methodology require to follow the requirements for accounting for fire under REDD, where land use changes are identified as the cause (or one of the causes) of anthropogenic fires in the project region?	1	n.a.	**n.a.**	**n.a.**
8.4 Summary of GHG Emission Reduction and/or Removals				

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
Does the VCS-Program methodology describe the procedure for quantifying net GHG emission reductions and/or removals, as a function of baseline emissions, project emissions and leakage, as follows: $ER_y = BE_y - PE_y - LE_y$ Where: ERy = Net GHG emissions reductions and/or removals in year y BEy = Baseline emissions in year y PEy = Project emissions in year y LEy = Leakage in year y	1	Total net GHG emissions are calculated in line with the requirements of the standard as: $C_{PRC,t} = \Delta C_{BSL,t} - \Delta C_{P,t} - \Delta_{CLK,t}$.	✓	✓
Quantification of GHG emission reduction and removals (VCS v3.4 Section 4.7)				
Does the VCS Program methodology establish criteria and procedures for quantifying net GHG emission reductions and removals generated by the project, which are quantified as the difference between the GHG emissions and/or removals, and/or as the difference between carbon stocks, from GHG sources, sinks and reservoirs relevant for the project and those relevant for the baseline scenario? Where appropriate, are net GHG emission reductions and removals, and net change in carbon stocks, quantified separately for the project and the baseline scenarios for each relevant GHG and its corresponding GHG sources, sinks and/or reservoirs?	1	See comment above Net GHG emission reductions and removals, and net change in carbon stocks, are quantified separately for the project and the baseline scenarios for each relevant GHG and its corresponding GHG sources.	✓	✓
Quantification of GHG emission reductions and removals (AFOLU v3.4 Section 4.7)				
Does the VCS Program methodology establish procedures for quantifying net GHG emission reductions and removals (the net GHG benefit), which shall be quantified as the difference between the GHG emissions and/or removals from GHG sources, sinks and carbon pools in the baseline scenario and the project scenario?	1	See comment above	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
Does the VCS Program methodology require that the GHG emissions and/or removals in the project scenario are adjusted for emissions resulting from project activities and leakage?	1	The GHG emissions and/or removals identified for the project scenario result from project activities and leakage as required.	✓	✓
Does the VCS Program methodology establish procedures for quantifying the net change in carbon stocks, so that the number of buffer credits withheld in the AFOLU pooled buffer account and market leakage emissions may be quantified for the project?	1	The methodology provides procedures to quantify the net change in carbon stocks as required.	✓	✓
9. Monitoring				
9.1 Data and Parameters Available at Validation				
Does the VCS Program methodology provide specification for data and parameters not monitored (i.e., that will be available at validation). Is the table copied for each data unit/parameter? Data Unit / Parameter: Data unit: Description: Source of data: Justification of choice of data or description of measurement methods and procedures applied: Any comment:	1	The methodology provides specification for data and parameters not monitored. The table provided by the methodology template v3.2 is applied as required. **Corrective Actions Request 10.** Ensure to provide specifications for every aspect of information required by the table	**CAR**	✓
9.2 Data and Parameters Monitored				
Does the VCS Program methodology provide specification for data and parameters monitored (i.e., that will be available at validation. Is the table copied for each data	1	The methodology provides specification for data and parameters not monitored.	**CAR**	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
unit/parameter? Data Unit / Parameter: Data unit: Description: Source of data: Description of measurement methods and procedures to be applied: Frequency of monitoring/recording: QA/QC procedures to be applied: Any comment:		**Corrective Actions Request 11.** • Ensure to use the table provided by the methodology template v3.2 • Ensure to provide specifications for every aspect of information required by the table • Ensure that all parameters monitored and applied are listed (see also CAR 14)		
Does the VCS Program methodology identify how the data/parameter is measured? Is equipment specifications provided, if applicable?	1	**Corrective Actions Request 12.** Ensure that the methodology provides a description of measurement methods and procedures to be applied. (See also CAR 3)	**CAR**	✓
Does the VCS Program methodology identify measurement and recording frequency	1	**Corrective Actions Request 13.** Ensure that measurement and recording frequency is defined (see also CAR 11)	**CAR**	✓
Does the VCS Program methodology identify calibration information such as frequency, date of last calibration and validity	1	n.a.	**n.a.**	
Data and Parameters (VCS v3.4 Section 4.8.1)				
Does the VCS Program methodology describe the data and parameters to be reported, including sources of data and units of measurement?	1	See comments above	**CAR**	✓
Do standards and factors used by the VCS Program methodology to derive GHG emission data meet the following requirements? 1) Be publicly available from a reputable and recognized source (e.g., IPCC, published government data, etc). 2) Be reviewed as part of its publication by a recognized	1	The factors used by the methodology are: 1) Publicly available from a reputable and recognized source 2) Reviewed as part of its publication by recognized competent organizations 3) See CAR 11	**CAR**	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
competent organization. 3) Be appropriate for the GHG source or sink concerned. 4) Be current at the time of quantification.		4) See CAR 11 **Corrective Actions Request 14.** • Clarify if values taken for the hydraulic conductivity and evapotranspiration (SIMGRO) and peat depletion rate and peat emission factor cover all conditions in south East Asia • Clarify how it is assured that most recent data available has to be applied		
When highly uncertain data and information are relied upon, does the VCS Program methodology select conservative values that ensure that the quantification does not lead to an overestimation of net GHG emission reductions or removals?	1	**Clarification Request 8.** Clarify if highly uncertain data and information is relied upon and if conservative values are applied	**CR**	✓
Does the VCS Program methodology use metric tonnes as the unit of measure?	1	The methodology uses metric tonnes as unit of measurement as required.	✓	✓
Does the VCS Program methodology convert the quantity of each type of GHG to tonnes of CO_2e? *Consistent with UNFCCC accounting, the six Kyoto Protocol greenhouse gases shall be converted using 100 year global warming potentials derived from the IPCC's Second Assessment Report (which are also available and reprinted in the Fourth Assessment Report). Ozone-depleting substances shall be converted using 100 year global warming potentials from the Fourth Assessment Report, which provides a full set of factors relevant to ODS methodologies and projects.*	1	The methodology convert the quantity of each type of GHG to tonnes of CO_2e	✓	✓
Does the VCS Program methodology establish criteria and procedures for monitoring, which shall cover the following:	1	See comments above in section 9.1 Data and Parameters Available at Validation and 9.2 Data and Parameters Monitored.	✓	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
1) Purpose of monitoring. 2) Monitoring procedures, including estimation, modelling, measurement or calculation approaches. 3) Procedures for managing data quality 4) Monitoring frequency and measurement procedures.				
Monitoring (AFOLU v3.4 Section 4.8)				
Does the VCS Program methodology establish criteria and procedures for monitoring, and specify the data and parameters to be monitored, as set out in the VCS Standard?	1	See comments above in section 9.1 Data and Parameters Available at Validation and 9.2 Data and Parameters Monitored.	✓	✓
Does the VCS Program methodology require to monitor Leakage as set out in Section 4.6.?	1	The methodology requires to monitor leakage via a PRA every five years	✓	✓
Where measurement plots or data from research plots are used to calibrate belowground biomass, soil carbon and dead wood decay models (as described above in Section 4.5.3), does the VCS Program methodology require to apply sound and reliable methods for monitoring changes in carbon stocks, including representative location of samplings sites and sufficient frequency and duration of sampling shall be applied?	1	n.a.	**n.a.**	**n.a.**
In addition, does the VCS Program methodology require that plots used to calibrate soil carbon models are measured considering appropriate sampling depths, bulk density and the estimated impact of any significant erosion (or plots with significant erosion shall be avoided)?	1	n.a.	**n.a.**	**n.a.**
Does the VCS Program methodology require that data used to calibrate belowground biomass and dead wood models have to consider an estimation of oven-dry wood density and the state of decomposition?	1	n.a.	**n.a.**	**n.a.**
9.3 Description of the Monitoring Plan				
Does the VCS Program methodology describe the criteria and procedures for obtaining, recording, compiling and ana-	1	The methodology provides a description of how to monitor water courses, climate variables, project ac-	**CAR**	✓

VCS Requirement	Ref	COMMENTS	Draft Concl	Final Concl
lysing data and information important for quantifying and reporting GHG emissions and/or removals relevant for the project and baseline scenario?		tivities, baseline emissions and project emissions **<u>Corrective Actions Request 15.</u>** • Clarify why it is not required to update the SIM-GRO model with new watercourse maps and characteristics for ex ante and ex post baseline and project emissions calculations. • Clarify why a description of the monitoring process of leakage is not included		
10. References and other information				
Does the VCS Program methodology include any relevant references and any other information relevant to the methodology/revision?	1	The methodology provides reference and information relevant for the methodology as required.	✓	✓

Table 2: Summary of Requests and Responses by Methodology Developer

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
Corrective Actions Request 1. • The table of contents and the table in section 6 are not using 10pt. • The headlines of the sections and subsections are not always in Arial and in blue font colour as requested by the template	General Requirements (Meth template)	• The table of contents and the table in section 6 have been updated to use Arial 10pt font. • The headlines of the sections and subsections have been updated to use Arial font and the blue colour requested by the template.	Arial 10pt is used throughout the section in compliance with the requirements. • Headlines of sections and subsections are updated as requested. Nevertheless the Headlines are formatted using Arial 11pt. • Footnotes need to be revised as some are do not exist although mentioned in the text of the methodology. • In line 1001 the naming of the parameter J_{BJS},x,d,t is not in line with the naming used in line 1008. • The numbering of the sections and subsections provided in this table to not match with or exist in the methodology provided.
		• Arial 10pt is used throughout the headlines. • Footnotes have been revised. • The naming of the parameter has been corrected. • The table of content has been updated.	The text is formatted and minor errors are corrected as required ☑ Request closed
Clarification Request 1. Clarify if the methodology is based on assumptions, parameters and procedures that have significant uncertainty and how such uncertainty has to be addressed.	General requirements: VCS v3.4 Section 4.1	The following additional text has been added to the following sections to clarify if the methodology is based on assumptions, parameters and procedures that have significant uncertainty and how such uncertainty has to be addressed: The following text has been added clarifying	LiDAR derived DTM is shown to be appropriate for the project. Accessibility and spatial resolution of the terrain measurements are limited. Combination reduces the uncertainty. ☑ Request closed

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		how default factors used in the methodology are conservative, or if the estimates show bias, that the bias results in a conservative value. Section 8.1.1.2 In regards to LiDAR criterion: These specifications facilitate a high accuracy of the LiDAR derived DTM, and limits uncertainty in the terrain measurements. This is a precondition for a conservative estimate of emission reductions.	
		In regards to SRTM data, which is the only Radar dataset available to generate DSM: Other superior Radar datasets may be used as they become available in the future.	Appropriate for the project, as SRTM datasets are the only ones available at the moment for DSM development. ☑ Request closed
		Section 8.1.1.3 In regards to the peat thickness model: Uncertainty in peat drilling data is addressed by assuming the lower bound of the peat thickness model as described below.	The requirements for modelling peat thickness are conservative as the lower bound of the estimated peat thickness. ☑ Request closed
		Section 8.1.1.4 In regards to the precipitation data inputs: Precipitation data can be uncertain, however, by using the data collected over a period of 20 years in the hydrological modelling this uncertainty is accounted for. In regards to the default evapotranspiration rate applied by the methodology:	Depending on the time resolution of the model input data the approach seems o.k. Moreover there seems to be no choice as no other climatic data are available. However, as precipitation and evapotranspiration are main drivers for the hydrological behavior of the peatland, clarify if the assumption that evapotranspiration can be transferred from the Southeast Asia mean to the project area can be validated through individual climate stations in the project area.

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		Evapotranspiration is mainly driven by wind speed, temperature and air humidity. These climatic factors are fairly similar for the tropical Southeast Asia region and therefore evapotranspiration is considered to be fairly uniform across the region.	☑ Request closed
		Please refer to section 8.1.1.4 of the methodology where the following sentence has been added: “In order to validate whether the value of 3.5 mm per day is applicable to the project area, it shall be compared to evapotranspiration values recorded to the closest meteorological station.” In addition please also refer to the supporting document as provided in folder: “Request 1,Evapotranspiration”.	The value to be used for evapotranspiration shall be compared to evapotranspiration values recorded to the closest meteorological station. ☑ Request closed
		Section 8.1.1.6.1 In regards to default coefficient values used in calibrated SIMGRO model: Although saturated hydraulic conductivity and water storage coefficients can vary, a conservative value has been used in comparison to other values reported for peatlands	The scarcity of individual site data drives the model application towards default coefficient values. If the relevant data are not spatially available it is good practice to use conservative values. ☑ Request closed
		Section 8.1.2 In regards to the default value for peat subsidence rate applied by the methodology: C This value is comparable compared to other values for drained tropical peatlands in Southeast Asia reported in the recent literature.	The value of 1.58 cm yr^{-1} [is] at the lower end of recent literature. The values used is not correctly referred to at present. See line 908.

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		The reference has been changed to the value applied.	The value respectively a whole sentence is still missing in the methodology. See line 911
		- The reference for 1.58 cm yr^{-1} has been added to the methodology. - The following sentence has been added: "Hooijer et al 2010 suggests a carbon density of 60 kg C cm^{-3}, which equates to 21.6 t CO2 ha^{-1} cm^{-1}, which are 1.58 cm of subsidence a year."	The value respectively the sentence which is quoting the value of the peat subsidence rate is no added to the text. ☑ Request closed
		Section 8.1.4.1.1 In regards to the CO_2 emission factor applied by the methodology: The emission factor is based on a review of GHG fluxes from tropical peatlands in SE Asia including multiple sites in Southeast Asia, and therefore the emission factor is broadly applicable to tropical peatlands in Southeast Asia. However an alternative emission factor may be used if justifiable for the project area and supported by scientific literature.	The CO^2 emission factor is based on scientific research and thus acceptable. ☑ Request closed
Corrective Actions Request 2. Clarify why should instead of shall in line 585 and 540.	General require-ments: VCS v3.4 Section 4.1	Should has been changed to "shall" in lines 585 and 540 of V09 of the methodology.	Clarify why should instead of shall in lines 453, 470, 521, 527 and throughout section 9
		"Should" has been changed to "shall".	Clarify why should instead of shall in the table below line 1350
		Should has been changed to shall throughout the document.	Should was replaced by shall. Thus obligatory requirements are clearly stated. ☑ Request closed
Clarification Request 2.	General	The following text has been added clarifying	In Section 8.5 the deduction of credits due to the

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
Clarify how conservativeness can be achieved as if the conservative factors specified in the CDM Meth Panel guidance (32nd Meeting Report, Annex 14) would have been applied.	requirements: VCS v3.4 Section 4.1	how default factors used in the methodology are conservative, or if the estimates show bias, that the bias results in a conservative value. Section 8.1.1.2 In regards to LiDAR criterion: These specifications facilitate a high accuracy of the LiDAR derived DTM, and limits uncertainty in the terrain measurements. This is a precondition for a conservative estimate of emission reductions. In regards to SRTM data, which is the only Radar dataset available to generate DSM: Other superior Radar datasets may be used as they become available in the future. Section 8.1.1.3 In regards to the peat thickness model: Uncertainty in peat drilling data is addressed by assuming the lower bound of the peat thickness model as described below. Section 8.1.1.4 In regards to the precipitation data inputs: «thus capturing the range of precipitation conditions in the area» In regards to the default evapotranspiration rate applied by the methodology: Evapotranspiration is mainly driven by wind speed, temperature and air humidity. These climatic factors are fairly similar for the tropical Southeast Asia region and therefore evapotranspiration is considered to be fairly uniform across the region.	uncertainty achieved in line with section 8.1.1.6 (renumbering is required) is described. The deduction is less than the deductions required in CDM Meth Panel guidance (32nd Meeting Report, Annex 14). Clarify how conservativeness can be achieved as if the conservative factors specified in the CDM Meth Panel guidance (32nd Meeting Report, Annex 14) would have been applied.

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		Section 8.1.1.6.1 In regards to default coefficient values used in calibrated SIMGRO model: Although saturated hydraulic conductivity and water storage coefficients can vary, a conservative value has been used in comparison to other values reported for peatlands. Section 8.1.2 In regards to the default value for peat subsidence rate applied by the methodology: This value is comparable compared to other values for drained tropical peatlands in Southeast Asia reported in the recent literature. Section 8.1.4.1.1 In regards to the CO_2 emission factor applied by the methodology: The emission factor is based on a review of GHG fluxes from tropical peatlands in SE Asia including multiple sites in Southeast Asia, and therefore the emission factor is broadly applicable to tropical peatlands in Southeast Asia. However an alternative emission factor may be used if justifiable for the project area and supported by scientific literature.	
		While for low uncertainties, the methodology deducts less than the CDM Meth panel guidance and is thus less conservative, the de-	Calculation of the deduction is less conservative than the CDM Meth Panel guidance (32nd Meeting Report, Annex 14) for uncertainty up to 40%. Un-

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		duction is higher for high uncertainties (>50 %) and thus the methodology produces more conservative estimates.	certainties higher than 40% lead to higher deductions than the CDM Meth Panel guidance. Thus higher uncertainties lead to higher deduction which is considered to be in line the requirements of the standard. ☑ Request closed
Clarification Request 3. Clarify how the uncertainty of the input parameters shall be assessed.	General requirements: VCS v3.4 Section 4.1	Text has been added clarifying how the uncertainty of input parameters shall be assessed. See Clarification Request 1.	See Clarification Request 1. ☑ Request closed
Corrective Actions Request 3. The requirements for the validation of the SIMGRO model, as well as the validation of the peat thickness model need further specification: • Clarify how accessibility is defined • Clarify how the discrete area is defined • Clarify how the measurement arrangement shall be designed (how far/close to waterways etc.) • Clarify if 10 measurements are sufficient even for large scale projects.	General requirements: VCS v3.4 Section 4.1	The following text has been added to Section 8.1.1.6.2 to clarify specifications regarding accessibility and the measurement arrangement, and to clarify that the measurements may be collected from anywhere within the project boundary. Field measurements shall take place within the project boundary. It is allowable for sampling locations to be chosen based on accessibility. The following conditions must be met at the sampling locations: • All data required for SIMGRO modelling must have been collected using criteria within the methodology. • Yearly water table level range must be within ±50 cm of that within project boundary • Minimum peat thickness in the area	Clarify if all water level conditions are sufficiently represented if it is not required to cover all conditions along the transect of an existing canal i.e. at the beginning, the middle and the end of a canal.

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		modeled must be greater than the minimum within the project boundary Sampling points must be located randomly or systematically with a random starting location. For example, a first sampling point may be chosen at a fixed distance from a canal (e.g. 10 m), and additional sampling points may be positioned in a regular grid with a distance fixed distance (e.g. 50 m) between point location. Locations can be accessible without great difficulty to allow for repeated measurements. At each sampling point the level from the peat surface to the water table shall be recorded. Field data measurements must be taken for a minimum of 8 months, but must include measurements within the dry season and the wet season at a frequency of at least once per month. Sampling location, water table level, and date of measurement shall be recorded in a geodatabase. A minimum of 10 sampling points is required to obtain 80 measurements for the required time period of 8 months for model validation.	
		Please refer to the following explanation t that has been added to section 8.1.1.6 of the methodology: “Sample transects shall be located at various positions along the canals, if possible. If only a single measurement transect can be installed along a canal, it must be assured that it is located close to the canal mouth, because the water tables at this location are considered to be closest to the peat surface during the dry season and resulting	The methodology requires that, if possible, the all conditions along the transect of an existing canal i.e. at the beginning, the middle and the end of a canal shall be covered. If this is not possible due to accessibility, measurements shall be taken close to the point where the canal enters into a river respectively leaves the peat area. It is suspected, that the water level at this places are highest thus it is most unlikely that emission reductions are overestimated.

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		emissions are lowest. Therefore, an overestimation of emission reductions by the project measures is conservatively avoided."	☑ Request closed
Clarification Request 4. Clarify how it is ensured that the application of the model rather lead to an underestimation than an overestimation of the GHG reductions and removals.	General requirements: VCS v3.4 Section 4.1	As outlined in the response to Clarification Requests 1 and 2 uncertainty in inputs is addressed and default parameters are conservative such that the application of the model leads to an underestimate rather than an overestimation of GHG reductions and removals.	See comments above ☑ Request closed
Corrective Actions Request 4. Clarify how it is ensured that most recent scientific data for factors/standards to be applied is taken into account when estimating GHG emissions and removals.	General requirements AFOLU v3.4 Section 4.1	For all default factors applied in this methodology, the methodology states that different factors may be used if justifiable for the project area.	The methodology provides default factors for the calculations. Nevertheless the methodology requires the application of most recently published factors if applicable respectively available. ☑ Request closed
Clarification Request 5. Provide the scientific study the methodology is referring to as definition of ombrogenous tropical peatlands the methodology is based on.	Eligible AFOLU Wetlands Restoration and Conservation (WRC) Category AFOLU v3.4 Section 4.2	An electronic copy of the reference for the definition of ombrogenous tropical peatlands in the methodology has been provided: Rydin, H, Jeglum, J. 2006. *The Biology of Peatlands*. Oxford University Press.	The scientific study was provided as requested. A clear definition of ombrogenous tropical peatlands is provided. ☑ Request closed
Corrective Actions Request 5. Ensure that all Tools referred to in the methodology are listed as required.	General Requirements (Meth template)	A list of the tools referred to in methodology has been added to the section "Sources".	All tools referred to in the methodology are listed as required. ☑ Request closed
Corrective Actions Request 6.	Defini-	A list of key acronyms used in the methodol-	All key terms and acronyms used in the method-

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
Ensure that all key terms and acronyms used in the methodology are listed as required.	tions	ogy has been added to Section 3.	ology are listed as required. ☑ Request closed
Clarification Request 6. Clarify if all applicability conditions listed are actually applicability conditions, considering that general VCS requirements do not need to be identified as applicability conditions in a methodology	Applicability conditions (VCS v3.4 Section 4.3)	The following applicability conditions are considered to be general VCS requirements and have been removed from the applicability condition section: • In order to be eligible for the development of a GHG emissions reduction project, evidence must be provided indicating either that drainage occurred prior to 1 January 2008 or that the project area was not drained or converted to create GHG credits. • Project activity must not convert a native ecosystem to generate GHG credits. Evidence must be provided that the project area was not cleared of native ecosystems to create GHG credits or that clearing or conversion occurred 10 years prior to the proposed project start date. • The project demonstrates a significant difference in the net GHG benefit between the baseline and project scenarios for at least 100 years. • The project proponent must be able to demonstrate ownership or control over the lands where the dams will be built. • Baseline shall be renewed every 10 years after the start of the project. The following applicability condition has been	The applicability conditions are limited to those that are applicability conditions for the methodology at hand. All general VCS requirements have been removed. ☑ Request closed

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		moved to the leakage and project accounting sections: • Carbon pools and GHG sources that cause project and/or leakage emissions may be deemed de minimis following guidance in the latest version of VCS AFOLU., Peer reviewed literature (such as average AG biomass of SE Asia tropical peatland land cover) and the most current version of the CDM "Tool for testing significance of GHG emissions in A/R CDM project activities" may be used to determine which carbon pools and GHG sources may be deemed de minimis. The following applicability condition is considered covered in the baseline section and has been removed from the applicability section: • It must be demonstrated that the hydrology of the peatland in the project area is currently affected by purposefully created drainage waterways using spatially explicit data, e.g. maps, satellite images and supplementary field investigation, including water levels and peat subsidence measurements. The following additional applicability conditions have been removed: • As a consequence of the project activity there is an increase in water levels, aver-	

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		aged over a given year, compared to the baseline situation during the crediting period. This will result in the maintenance of soil carbon stocks in comparison to the baseline situation. The order of several of the applicability conditions has been changed so that baseline and project conditions are grouped together in attempt to add clarity.	
Corrective Actions Request 7. Provide a justification/ explanation for CH_4 from the project activity.	Project boundary (VCS v3.4 Section 4.4)	In regards to the CH4 emission factors, IPCC emission factor is applied or other factors if justifiable.	Plausible justifications for the GHG sources, sinks and reservoirs included or excluded are provided. ☑ Request closed
		CH4 GHG source was removed from the project scenario of the methodology because it is deemed to be de minimis in comparison to the CO2 emissions in the baseline. Please refer to the de minimis calculation based on Rieley et.al. 2008 as provided in folder "Request 7,9,CH4 emissions"	CH4 was removed from the whole methodology as it is considered to be de minimis in comparison to CO2 emissions in the baseline. This is in line with section 4.3.4 of the AFOLU Requirements VCS Version 3.3. ☑ Request closed
Corrective Actions Request 8. • Clarify if the methodology requires identifying fire in the baseline scenario (frequency, intensity and extent)? • Clarify how the methodology considers any relevant current and planned land use that may affect the occurrence of fire?	Baseline Scenario (AFOLU v3.4 Section 4.4)	The following text has been added to Section 6: This methodology conservatively does not account reductions of GHG emissions associated with avoiding peat fires, therefore determination of the frequency, intensity and extent of fires in the baseline is not required.	Fire in the baseline is conservatively not accounted for. Fire is accounted for in the ex post estimation of project emissions following the VM0004 Methodology for Conservation Projects that Avoid Planned Land Use Conversion in Peat Swamp Forests, v1.0. ☑ Request closed

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		Methods to account for fire in estimation of ex post project emissions has been added to Section 9.3.5.2 This text comes directly from VM0004 Methodology for Conservation Projects that Avoid Planned Land Use Conversion in Peat Swamp Forests, v1.0	
Clarification Request 7. Specify how "significant differences" can be identified	Baseline and Project Emissions/Removals (AFOLU v3.4 Section 4.5)	The following applicability condition is considered to be general VCS requirements and have been removed from the applicability condition section: • The project demonstrates a significant difference in the net GHG benefit between the baseline and project scenarios for at least 100 years.	Significant difference is required in the applicability conditions. Please specify how the significance of the difference can be characterized.
		The project demonstrates a significant difference in the net GHG benefit between the baseline and the project scenarios due to the fact that the emission reduction exceeds by far 5% (please refer to the de minimis rule of the AFOLU v3.3 Section 4.3.3).	Significant difference over a period of 100 years is a general VCS requirement for WRC Projects and thus does not need to be required in a WRC methodology. ☑ Request closed
Corrective Actions Request 9. Clarify why leakage "LK CH_4" is not mentioned in lines 1152/1153	Leakage (AFOLU v3.4 Section 4.6)	The following text has been added to Section 8.3 Leakage: Emissions from activity displacement are estimated as the sum of emissions due to potential degradation and net emissions from methane in the Excluded Area of Watershed(s).	Leakage from LK CH_4 has been added as requested.
		CH_4 GHG source was removed from the methodology due to being de minimis in comparison to the CO_2 emissions. Please also refer to the Corrective Action Request 7.	CH4 was removed from the whole methodology as it is considered to be de minimis in comparison to CO2 emissions in the baseline. This is in line with section 4.3.4 of the AFOLU Requirements

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
			VCS Version 3.3. ☑ Request closed
Corrective Actions Request 10. Ensure to provide specifications for every aspect of information required by the table	Data and Parameters Available at Validation	Parameter tables have been updated with complete information	Specifications for every aspect of information required by the tables is provided. ☑ Request closed
Corrective Actions Request 11. • Ensure to use the table provided by the methodology template v3.2 • Ensure to provide specifications for every aspect of information required by the table • Ensure that all parameters monitored and applied are listed (see also CAR 14)	Data and Parameters Monitored	• Parameter tables have been updated to template v3.2. • Specifications for every aspect of information required by parameter tables in template v3.2 have been provided. • All parameters monitored and applied have been listed.	Tables provided are applied, specifications for every aspect of information are provided and all parameters to be monitored are listed. ☑ Request closed
Corrective Actions Request 12. Ensure that the methodology provides a description of measurement methods and procedures to be applied. (See also CAR 3)	Data and Parameters Monitored	Additional text has been added to the methodology to clarify procedures for collecting ground water level measurements from sampling points.	Description of measurement methods and procedures are provided as requested. ☑ Request closed
Corrective Actions Request 13. Ensure that measurement and recording frequency is defined (see also CAR 11)	Data and Parameters Monitored	• Parameter tables have been updated to template v3.2. • Specifications for every aspect of information required by parameter tables in template v3.2 have been provided. • All parameters monitored and applied have been listed.	Measurement and recording frequency are defined as requested. ☑ Request closed
Corrective Actions Request 14. • Clarify if values taken for the hydraulic conductivity and evapotran-	Data and Parameters (VCS v3.4 Sec-	The following text has been added to the methodology Section 8.1.1.6.1	Clarify if high water levels increase or decrease CO^2 emissions. See also comments to CR 1

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
spiration (SIMGRO) and peat depletion rate and peat emission factor cover all conditions in south East Asia • Clarify how it is assured that most recent data available has to be applied	tion 4.8.1)	In regards to default coefficient values used in calibrated SIMGRO model: Saturated hydraulic conductivity and water storage coefficient are quite variable in the woody, fairly undecomposed surface layer of peatlands in Southeast Asia. However, the values used are conservative compared to values reported by others for the same peatlands. Section 8.1.1.4 In regards to the default evapotranspiration rate applied by the methodology: Evapotranspiration is mainly driven by wind speed, temperature and air humidity. These climatic factors are fairly similar for the tropical Southeast Asia region and therefore evapotranspiration is considered to be fairly uniform across the region. Section 8.1.2 In regards to the default value for peat subsidence rate applied by the methodology: This value is comparable to other values for drained tropical peatlands in Southeast Asia reported in the recent literature. Section 8.1.4.1.1 In regards to the CO_2 emission factor applied by the methodology: As especially high water levels increase estimated CO_2 emissions, using average water levels provide a conservative estimate of CO_2 emission reductions.	

Request	Ref. to VCS	Response by Methodology Developer	Conclusion by Audit Team
		The above emission factor is based on a review of GHG fluxes from tropical peatlands in SE Asia including multiple sites in Southeast Asia, and therefore the emission factor is broadly applicable to tropical peatlands in Southeast Asia. However an alternative emission factor may be used if justifiable for the project area and supported by scientific literature. In regards to CH4 and N2O emission factors, IPCC emission factors are applied or other factors if justifiable.	
		This is a typing error. High water levels decrease CO_2 emissions.	See also comments to CR 1 ☑ Request closed
Clarification Request 8. Clarify if highly uncertain data and information is relied upon and if conservative values are applied	Data and Parameters (VCS v3.4 Section 4.8.1)	Text has been added clarifying if highly uncertain data and information is relied upon and if conservative values are applied. See responses to Clarification Requests 1 and 2.	See also comments to CR 1 ☑ Request closed
Corrective Actions Request 15. • Clarify why it is not required to update the SIMGRO model with new watercourse maps and characteristics for ex ante and ex post baseline and project emissions calculations. • Clarify why a description of the monitoring process of leakage is not included	Description of the Monitoring Plan	• Text has been added to Section 9.3.3.3 clarifying that it is required to update the SIMGRO model with new watercourse maps and characteristics for ex ante and ex post baseline and project emissions calculations. • Monitoring process of leakage has been included in Section 9.3.5.3	The monitoring plan is revised. The SIMGRO model now needs update according to new watercourse maps and characteristics for ex ante and ex poste baseline and project emissions calculations. A description of the monitoring of leakage is provided as requested. ☑ Request closed

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ANNEX 2: INFORMATION REFERENCE LIST

<table>
<tr><th>Ref. No.</th><th>Author/Editor/ Issuer</th><th>Title, Type of Document</th><th>Date</th></tr>
<tr><td>1.</td><td></td><td>Interviewed Persons:
<table>
<tr><th>Name</th><th>Position, Organisation</th></tr>
<tr><td>Sarah Walker</td><td>Winrock Int.</td></tr>
<tr><td>Erin Swails</td><td>Winrock Int.</td></tr>
<tr><td>Henk Wosten</td><td>Alterra Wageningen</td></tr>
<tr><td>Ab Veldhuizen</td><td>Alterra Wageningen</td></tr>
<tr><td>Peter Navratil</td><td>Remote Sensing Solutions</td></tr>
<tr><td>Yougha von Laer</td><td>WWF Germany</td></tr>
<tr><td>Guenola Kahlert</td><td>WWF Germany</td></tr>
</table></td><td></td></tr>
<tr><td>2.</td><td>Winrock International, Remote Sensing Solutions GmbH, Alterra Wageningen, WWF Indonesia and WWF Germany</td><td>Rewetting of drained tropical peatlands in southeast Asia, Version 12</td><td>Nov 2013</td></tr>
<tr><td>3.</td><td>University Wageningen</td><td>Webpage: http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/Alterra/Faciliteiten-Producten/Software/SIMGRO.htm</td><td>Last accessed Nov 2013</td></tr>
<tr><td>4.</td><td>UNFCCC</td><td>CDM Meth Panel 32nd meeting Report Annex 14</td><td>04 Aug 2010</td></tr>
<tr><td>5.</td><td>Couwenberg et al</td><td>Greenhouse gas fluxes from tropical peatlands in south-east Asia</td><td>2009</td></tr>
<tr><td>6.</td><td>Hooijer et al</td><td>Current and future CO_2 emissions from drained peatlands in Southeast Asia</td><td>2010</td></tr>
<tr><td>7.</td><td>Jaenicke et al</td><td>Determination of the amount of carbon stored in Indonesian peatlands</td><td>2008</td></tr>
<tr><td>8.</td><td>Jaenicke et al</td><td>Planning hydrological restoration of peatlands in Indonesia to mitigate carbon dioxide emissions</td><td>2010</td></tr>
</table>

Information Reference List

Title of Methodology: Rewetting of drained tropical peatlands in southeast Asia

Number of Pages: 2

Ref. No.	Author/Editor/ Issuer	Title, Type of Document	Date
9.	Limin et al	The massive exploitation of peat swamp forest potentially has not successfully increased the local people's prosperity in Central Kalimantan	
10.	Morgan and Stolt	A COMPARISON OF SEVERAL APPROACHES TO MONITOR WATER-TABLE FLUCTUATIONS	2004
11.	Pfeifer	DERIVATION OF DIGITAL TERRAIN MODELS IN THE SCOP++ ENVIRONMENT	2001
12.	Querner and Povilaitis	Hydrological effects of water management measures in the Dovinė River	2009
13.	Reyes	Wood Densities of Tropical Tree Species	1992
14.	Realey and Page	Wise use of tropical peatland	2005
15.	Van Walsum et all	SIMGRO 7.1.0 Theory and model implementation	2010
16.	Martin Flood	ASPRS Guidelines Vertical Accuracy Reporting for LiDAR Data	2004
17.	Vidon and Smith	Assessing the Influence of Drainage Pipe Removal on Wetland Hydrology Restoration: A Case Study	2008
18.	Wosten et al	Peat subsidence and its practical implications: a case study in Malaysia	1997
19.	Wosten et al	Peat–water interrelationships in a tropical peatland ecosystem in Southeast Asia	2008
20.	Hooijer	Subsidence and carbon loss in drained tropical peatlands	2012