

KATINGAN PEATLAND RESTORATION AND CONSERVATION PROJECT

VCS VERIFICATION REPORT



**ENVIRONMENTAL
SERVICES, INC.**



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Document Prepared By: Environmental Services, Inc. and Aster Global Environmental Solutions, Inc.

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Summary:

Environmental Services, Inc., (ESI) was contracted by PT. Rimba Makmur Utama, on 24 January 2019 to conduct the fourth monitoring period VCS verification (01 January 2018 to 31 December 2018) of the *Katingan Peatland Restoration and Conservation Project* [Validated Project Description (PD) dated 11 May 2016]. During the course of the verification, the audit team and ANSI Accreditation transferred from Environmental Services Inc. to Aster Global Environmental Solutions (Aster Global). The Katingan Project follows the framework of Reducing Emissions from Deforestation and Degradation (REDD) and is achieving Greenhouse Gas (GHG) emission reductions as well as tropical peatland forest protection and conservation through payments for ecosystem services.

The goals of the project as described in the fourth Monitoring Report (Section 1.1) include, “protect and restore 149,800 hectares of peatland ecosystems, to offer local people sustainable sources of income, and to tackle global climate change – all based on a solid business model.”

The verification objective included an assessment of compliance with VCS Version 3 and all associated updates, the selected methodology (VM0007, v1.5), and the validated Project Description (PD) *The Katingan Peatland Restoration and Conservation Project* dated 11 May 2016. ESI/Aster Global Environmental Solutions [Aster Global] (herein referred to as the Validation/Verification Body – VVB/Verification Team) assessed the Greenhouse Gas (GHG) emission removals for the fourth

monitoring period/verification period 01 January 2018 to 31 December 2018 through Agriculture, Forestry and Other Land Use (AFOLU) criteria. The project activities are categorized as; Reduced Emissions from Deforestation and Degradation (REDD), a combination of REDD+WRC¹ and ARR²+WRC; specifically, as Avoiding Planned Deforestation (APD) and Reforestation (ARR), in combination with Conservation of Undrained and Partially Drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities.

The scope of the verification following Section 4.3.4 of ISO 14064-3:2006 included the GHG project implementation; physical infrastructure, activities, technologies and processes of the GHG project; GHG sources, sinks and/or reservoirs; types of GHGs; and time periods covered. *The Katingan Peatland Restoration and Conservation Project* follows the framework of project activities listed above.

The criteria followed the verification guidance documents provided by VCS located at <http://v-c-s.org/program-documents>. Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document.

A summary of all findings is included in Appendix B. There are no restrictions of uncertainty.

ESI/Aster Global confirms all verification activities including objectives, scope and criteria, level of assurance, monitoring and project documentation adherence to VCS Version 3 and all associated updates as documented in this report are complete. ESI/Aster Global concludes without any qualifications or limiting conditions that the *Katingan Peatland Restoration and Conservation Project Monitoring Report* (v1.0 dated 14 June 2019) meets the requirements of VCS Version 3 and all associated updates.

The GHG assertion provided by PT. Rimba Makmur Utama and verified by ESI/Aster Global has resulted in the GHG emissions reduction or removal of 5,703,688 tCO₂ equivalents by the project during the verification period/reporting period (01 January 2018 to 31 December 2018). This value is gross of the 10% (570,368 tCO₂ equivalents) buffer withholding based on the non-permanence risk assessment tool. This results in 5,133,319 tCO₂ equivalents of credits eligible for issuance as VCU's.

¹ Wetlands Restoration and Conservation

² Afforestation, Restoration and Revegetation

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1 INTRODUCTION

1.1 Objective

The verification objective included an assessment of compliance with VCS Version 3 and all associated updates, the selected methodology (VM0007, v1.5), and the validated Project Description (PD) *The Katingan Peatland Restoration and Conservation Project* dated 11 May 2016. ESI/Aster Global (herein referred to as the Validation/Verification Body – VVB) assessed the Greenhouse Gas (GHG) emission removals for the fourth monitoring period/verification period 01 January 2018 to 31 December 2018 through Agriculture, Forestry and Other Land Use (AFOLU) criteria. The project activities are categorized as; Reduced Emissions from Deforestation and Degradation (REDD), a combination of REDD+WRC³ and ARR⁴+WRC; specifically, as Avoiding Planned Deforestation (APD) and Reforestation (ARR), in combination with Conservation of Undrained and Partially Drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities. ESI/Aster Global assessed whether the Project Proponent adequately addressed project emissions, unplanned reductions in carbon stocks, and any possible leakage outside of the project boundary.

The non-permanence risk analysis was assessed for this verification. Further, following Section 2.1.2 of the VCS Validation & Verification Manual, V3.1, the objectives of the verification exercise were to evaluate the monitoring report and assess:

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- The extent to which GHG Emission Reductions or Removals reported in the monitoring report are materially accurate.

1.2 Scope and Criteria

The scope of the verification following Section 4.3.4 of ISO 14064-3:2006 included the GHG project implementation; physical infrastructure, activities, technologies and processes of the GHG project; GHG sources, sinks and/or reservoirs; types of GHGs; and time periods covered. The geographic verification scope is defined by the project boundary, the carbon reservoir types, management activities, contract periods and related. *The Katingan Peatland Restoration and Conservation Project* follows the framework of project activities listed above in Section 1.1 and below. The scope of the project was outlined by the Project Proponent within the Project Description dated 11 May 2016 and is re-defined as follows for the GHG project:

Baseline Scenario	Degradation/deforestation-threats from expansion of industrial pulpwood (acacia).
Activities/Technologies/Processes	Protections of largely intact un-drained peat swamp

³ Wetlands Restoration and Conservation

⁴ Afforestation, Restoration and Revegetation

	forest- utilizing VCS VM0007
Sources/Sinks/Reservoirs- REDD	AGB emissions due to deforestation AGB emissions due to degradation AGB emissions due to uncontrolled burning
Sources/Sinks/Reservoirs - ARR	AGB emissions due to uncontrolled burning
Sources/Sinks/Reservoirs - WRC	Emissions from microbial decomposition of peat Emissions from dissolved organic content (DOC) Emissions from uncontrolled peat burning
GHG Type	CO ₂ , CH ₄ , and N ₂ O
Time Period (monitoring/verification period)	4 th Monitoring Period: 01 January 2018 - 31 December 2018
Project Boundary	Project area consists of largely intact, un-drained peat swamp forest; 149,800 hectares in Central Kalimantan Province, Indonesia
GHG reduction and/or removal	5,703,688 tCO ₂ e This value is gross of the 10% (570,368 tCO ₂ equivalents) buffer withholding based on the non-permanence risk assessment tool

The criteria followed the verification guidance documents provided by VCS located at <http://v-c-s.org/program-documents>. Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document. These documents include the following:

- *VCS Program Guide (v3.7, 21 June 2017)*
- *VCS Standard (v3.7, 21 June 2017)*
- *Agriculture, Forestry and Other Land Use (AFOLU) Requirements (v3.6, 21 June 2017)*
- *Program Definitions (v3.7, 21 June 2017)*
- *AFOLU Non-Permanence Risk Tool (v3.3, 19 October 2016)*
- *VM0007 (v1.5, 09 March 2015)*
- *Validated Project Description (11 May 2016)*

1.3 Level of Assurance

The level of assurance was used to determine the depth of detail that the Verifier placed in the Verification and Sampling Plan to determine if there are any errors, omissions, or misrepresentations (ISO 14064-3:2006). ESI/Aster Global assessed the project's implementation of general principles, data collection and processing, sampling descriptions, documentation, *ex post* calculations, etc., to provide reasonable assurance to meet the Project Level requirements of the VCS Program. Based on the verification findings, a final evaluation statement reasonably assures that the project GHG representations are materially accurate. The evidence used to achieve a reasonable level of assurance is specified in subsequent sections of this report.

1.4 Summary Description of the Project

The project is located in Katingan and Kotawaringin Timur districts, Central Kalimantan, Republic of Indonesia, and is aimed at reducing and avoiding emissions related to Planned Deforestation and Reforestation in combination with Conservation of Undrained and Partially drained Peatland and Rewetting of Drained Peatland activities. The project is developed and managed by the ecosystem restoration concession holder P.T. Rimba Makmur Utama (P.T. RMU). The goal of the project as described in the fourth Monitoring Report (Section 1.1) include, "protect and restore 149,800 hectares of peatland ecosystems, to offer local people sustainable sources of income, and to tackle global climate change – all based on a solid business model."

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification assessed the Project's compliance with VCS Version 3 and all associated updates, the selected methodology (VM0007, v1.5), and the validated Project Description (PD) The *Katingan Peatland Restoration and Conservation Project* dated 11 May 2016. ESI/Aster Global assessed the Greenhouse Gas (GHG) emission removals for the fourth monitoring period/verification period 01 January 2018 to 31 December 2018 through Agriculture, Forestry and Other Land Use (AFOLU) criteria, specifically; Reduced Emissions from Deforestation and Degradation (REDD), a combination of REDD+WRC5 and ARR6+WRC; as Avoiding Planned Deforestation (APD) and Reforestation (ARR), in combination with Conservation of Undrained and Partially Drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities. ESI/Aster Global assessed whether the Project Proponent adequately addressed project emissions, unplanned reductions in carbon stocks, and any possible leakage outside of the project boundary.

The non-permanence risk analysis was assessed for this verification. Further, following Section 2.1.2 of the VCS Validation & Verification Manual, V3.2, the objectives of the verification exercise were to evaluate the monitoring report and assess:

⁵ Wetlands Restoration and Conservation

⁶ Afforestation, Restoration and Revegetation

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- The extent to which GHG Emission Reductions or Removals reported in the monitoring report are materially accurate.

The criteria followed the verification guidance documents provided by VCS located at <http://v-c-s.org/program-documents>. Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document. Please see Section 1.2 of this report.

In the verification process, there is a risk that potential errors, omissions, and misrepresentations will be found; therefore, a risk-based approach was used to guide the collection of appropriate and sufficient evidence to support a reasonable level of assurance. A risk-based approach means that the verification team focused on items that might result in a material misstatement of the reported GHG assertion.

A project specific Verification and Sampling Plan was developed to guide the verification auditing process to ensure efficiency and effectiveness. The purpose of the Verification and Sampling Plan was to present a risk assessment for determining the nature and extent of verification procedures necessary to ensure the risk of auditing error was reduced to a reasonable level. The Verification & Sampling Plan methodology was derived from all items in our verification process stated above. Specifically, the sampling plan utilized the VCS guidance documents and ISO 14064-3. Any modifications applied to the Verification and Sampling plan were made based upon the conditions observed for monitoring to detect the processes with highest risk of material discrepancy. A detailed field plan was developed to guide the verification site visit and is embedded within the Verification & Sampling Plan.

For the field sampling effort, direct measurement, observation and review of the monitoring period emission reductions in the key areas were determined to be the greatest risk, followed by ground-truthing and review of project activities. Field sampling and techniques were based on the project parameters/scope and best professional judgment of the VVB to meet a reasonable level of assurance as directed by the professional judgment of the Lead Verifier. Because the biomass inventory (REDD) was validated and has not changed, aboveground inventory plots were not selected for detailed review/re-measurement. For the peat component (WRC), monitoring period stratification and canal extent were assessed. Fires did occur during the fourth reporting period (see Section 2.4 of this report). Extensive review of all remote sensing data was undertaken of the project area to aid the VVB in establishing a reasonable level of assurance regarding confirming the reported areas of *ex post* disturbance (from the remote sensing-based analysis) for the quantification of project emissions.

In addition, a risk-based approach was used for the on-the-ground field sampling effort to select key areas for direct observation of peatland hydrologic monitoring, stratification and post-fire conditions, and stated project activities. The most likely access points for anthropogenic degradation (along watercourse access points) within the Project Area and adjacent lands were toured to allow the VVB to establish a reasonable level of assurance regarding the

implementation of project activities, and to further confirm the reported areas of *ex post* disturbance. Please see Section 2.4 of this report for more details.

The desktop verification component included a full review of all project documentation and calculations received from the Project Proponent as described throughout this report.

2.2 Document Review

A detailed review of all project documentation was conducted to ensure consistency with, and identify any deviation from, VCS Program requirements, the methodology (VM0007), and the validated PD. Initial review focused on the validated PD and Monitoring Report (MR) relative to the field conditions observed and interviews with project management staff. Project details, implementation status, data and parameters, and quantification of GHG emission reductions and removals were thoroughly examined. Key supporting documents were also reviewed. These included monitoring data (i.e., remote sensing/Geographic Information System (GIS) data), Standard Operating Procedures (SOPs), financial analyses, stratification boundaries, maps and aerial images, fire-specific monitoring data, biomass and carbon calculation spreadsheets, and responses to Clarification Requests (CLs) and Opportunities for Improvement (OFIs).

The VCS AFOLU Non-Permanence Risk Tool was used by the Project Proponent to assess overall project risk. The VVB reviewed the Non-Permanence Risk Report provided with the verification supporting documentation and confirmed that the Project adheres to the requirements set out in the VCS AFOLU Non-Permanence Risk Tool. Each risk factor was thoroughly assessed for conformance. Any identified NCR and/or CL findings related to the AFOLU Non-Permanence Risk Tool/Report are presented in Appendix B. The final score was calculated to be 10%.

For a listing of all documents received from the client for this verification, please see Appendix A.

2.3 Interviews

Interviews were performed during the verification site inspection and as part of the overall verification process. The ESI/Aster Global verification team met with individuals with various roles in the project. This included a series of interviews with on-site and in-country staff that support the mission of the project and other conservation objectives. Onsite interviews and informal discussions were conducted with project staff, including P.T. RMU personnel, members of Wetlands International, technical consultant Permian Global, members and leaders of the local communities.

The following is a list of the main interviewees:

Individual	Affiliation	Role
Dharsono Hartano	PT. Rimba Makmur Utama (PT. RMU)	CEO
Rezal Kusumaatmadja	PT. Rimba Makmur Utama (PT. RMU)	COO

Big Antono	PT. Rimba Makmur Utama (PT. RMU)	Database and IT Manager
Syamsul Budiman	PT. Rimba Makmur Utama (PT. RMU)	Forestry Liaison and Planning Director
Marwan Djumhaer	PT. Rimba Makmur Utama (PT. RMU)	Mapping and GIS Manager
Taryono Darusman	PT. Rimba Makmur Utama (PT. RMU)	Interim General Manager
Meyner Nusalawo	PT. Rimba Makmur Utama (PT. RMU)	Project and Monitoring Area Manager
Hardian Mulyana	PT. Rimba Makmur Utama (PT. RMU)	Deputy Director of Mapping/GIS Specialist
Mr. Gede Wydiana	PT. Rimba Makmur Utama (PT. RMU)	Section Head of Logistics
Yusef Fabianus Hadiwinata	PT. Rimba Makmur Utama (PT. RMU)	Community Development Manager
Irmanto	PT. Rimba Makmur Utama (PT. RMU)	Head of Nursery
Village leaders and community representatives	Jahanjang Village	Residents
Village leaders and community representatives	Parupuk Village	Residents
Village leaders and community representatives	Galinggang Village	Residents
Village leaders and community representatives	Mendawai Village	Residents
Village leaders and community representatives	Hantipan Village	Residents
Village leaders and community representatives	Batuah Village	Residents
Village leaders and community representatives	Seragam Jaya Village	Residents
Irwansyah Reza Lubis	Wetlands International	Technical Consultant
I Nyoman Suryadiputra	Wetlands International	Technical Consultant
Dipa Satriadi Rais	Wetlands International	Technical Consultant

Iwan Tricahyo Wibisono	Wetlands International	Technical Consultant
Nathan Renneboog	Permian Global	Technical Consultant
Nick Brickle	Permian Global	Technical Consultant

2.4 Site Inspections

The verification site inspection followed the VVB’s prepared Verification and Sampling Plan process and was conducted on 22-29 April 2019 by the Lead Verifier. The verification site visit was a required tool to help the VVB reach reasonable assurance for verification of monitoring period reported elements. It also allowed the VVB to; understand application of the methodology on-site, confirm the implementation of project activities, and to identify possible sources of error to focus desktop verification efforts. The site visit ground inspection was performed to assess monitoring efforts, including but not limited to; unplanned deforestation activities, unplanned degradation, and community member feedback.

The objectives of the on-site inspections performed were to:

- Conduct a risk-based review of the project area and project activities to check that the project adhered to the requirements of the VCS rules and the methodology during the monitoring period
- Select data samples from ground measurements for verification purposes in order to achieve a reasonable level of assurance and meet the materiality requirements of the project following Section 5.1.3 of the VCS Standard
- Check that monitoring was conducted in accordance with the requirements of the validated monitoring plan, the VM0007 methodology and VCS rules

A ground inspection was made of the project area and surrounding areas along the Mentaya River, Katingan River, Terentang River, Klaru River and southern canal area including drone flyovers to visually review inaccessible areas. The following villages were visited, and interviews conducted:

Village	Project Reported Activities	Confirmation/Comments
Seragam Jaya	None reported.	The support for the agroecology group was confirmed implemented through interviews with the regional farming coordinator. Confirmed firefighting crew presence, training and support from RMU. Representatives from the Seragam Jaya and

		Mentaya Seberang woman's group were interviewed and proponent support was confirmed for four clinics to help babies, toddlers, and senior citizens. The communication between proponents and stakeholders for these activities was considered strong.
Batuah	None reported.	Firefighting team presence. Room for stakeholder consultation improvement following VCS Standard Section 3.17.4, see FAR #1 in Section 2.5.1 of this report.
Terantang Hulu	None reported.	MOU has been signed. RMU provides support for renovation and a new building for educational purposes. Pilot areas were observed for growing cashew nuts. The communication between proponents and stakeholders at this village for these activities was considered strong.
Hantipan	Agroecology program, firefighting staff, MOU development. Coconut business development.	Agroecology program remains small but strong interest from community members. Proponent provided training to village firefighters and the community remains firmly invested and is appreciative of the overall RMU fire prevention program. MOU is expected to be signed by 01 May 2019. The community would like training from RMU on alternative business opportunities using coconuts. Room for stakeholder

		consultation improvement following VCS Standard Section 3.17.4, see FAR #1 in Section 2.5.1 of this report.
Mendawai	Facilitating Village Forest. Microfinance to finance small-business and agricultural improvement activities. Agroecology (STA). Firefighting team.	Microfinancing program confirmed implemented and highly successful. The microfinance woman's group leader indicated increasing interest for participation of microfinance. Village Forest proposal submitted to the Ministry of the Environment and Forestry, but no response yet received. Agroecology farmer group continued success and demonstrated sales results. Firefighting team received training from the proponent and conduct regular patrols during fire season. The communication between proponents and stakeholders in this village for these activities was considered strong.
Galinggang	None reported in MR.	This village was visited as a result of the FAR from the 2017 verification period ⁷ . RMU grievance box confirmed installed in house of village head. MOU was signed the night before audit visit by this village. MOU was confirmed developed with village input. Village expressed interest in support from the proponent for firefighting equipment. The outreach and communication appeared to be an

⁷ Please see Section 2.6.1 of the third period verification report "Katingan Peatland Restoration and Conservation Project VCS+CCB Verification Report" dated 10 August 2018

		improvement over the visitation in 2018 and is indicative of stronger stakeholder outreach.
Parupuk	Old river latrines replaced by new sanitary latrines for all households. A women-run nursery in Parupuk established as a village business unit (BUMDesa) and has planted around 20,000 seeds, mainly of Jelutung.	Latrines confirmed installed in households and successful Jelutung seedlings were observed. Also confirmed chicken egg production started with support from the proponent. Stakeholder outreach was considered to be strong as confirmed by the discussions with the village leader.
Jahanjang	No activities for 2018 except for continued support for the Napier grass and biogas initiative.	No activities for 2018. For 2019 a radio broadcast service was installed and will begin operation in 01 May 2019 providing educational and communication updates. Confirmed progress towards cattle fencing expansion.

Memorandum of Understanding (MOU) documents continue to be developed and signed at the time of the site visit. It is expected that MOUs will be in place in nearly all villages for the next verification. The MOUs provide a roadmap for project activity implementation through a collaborative framework which has been developed directly through the consultation process as identified in the validated PD and confirmed during site visit interviews.

To further confirm the reported areas of *ex post* deforestation resulting in carbon stock losses, an extensive review of drone imagery and project proponent supplied, unaltered PlanetLabs imagery was also undertaken at the desktop. The Project's disturbance dataset was ocularly confirmed by comparing against the monitoring period PlanetLabs imagery where the stratified classes were readily distinguished in the project area.

During the project site visit, the following aspects of the project were reviewed:

WRC (GHGWPS-WRC)

- Visitation of the central camp and southern canal area to observe general status
- Discussion of canal blocking/planned peatland re-wetting locations and plans
- Discussion of ditch expansion and/or new discoveries
- Check appropriateness/correctness of ditch delineation/stratification, review and discussion of canal surveys
- Discussion of peat and water level surveys and monitoring

REDD (Δ CWPS-REDD)

- Aboveground stock changes due to deforestation
- Observe instances of period degradation/illegal logging, discussion of stump surveys, transition/threshold from degradation to deforestation status
- Opportunistically spot check accessible deforestation areas- preference to larger areas and both degradation and forest conversion, drone flights (if available)
- Community member interviews on land usage, ownership, and conflicts

Burnt Areas

- Aboveground stock changes and peat oxidation due to uncontrolled burning
- Visitation of 2018 burnt areas in southeast of project area, south of Hantipan canal, fire boundaries observation, possibly visit random points
- General discussion of monitoring period fire incidences
- Review, interview and discuss fire protection campaign, training and associated monitoring efforts

General

- Forest Protection – Discuss status of incursions and mitigations by patrols for illegal logging and related
- Discussion of accounting adjustments as a result of monitoring (degradation, deforestation)
- Leakage- discussion of concession allotments
- ARR (reforestation)- discussion of status of fire break plantations and nursery production (ARR not accounted for this monitoring period)
- Agroforestry- discussion of areas delineated
- Boundary - Discuss boundary demarcation progress

In addition to the field components described above, two days were spent conducting the office an office audit. The specific elements of the office audit that were confirmed include but are not limited to:

- Interviewed project staff to gather information regarding the monitoring of the project, evidence of conformance with specific requirements of the methodology
- Reviewed the status of any new permits allotted to the agent of deforestation
- Reviewed and discussed possibility of illegal expansion of other concessions
- Confirmed organizational structure and operation
- Confirmed data management, compilation and storage

While conducting the above sampling efforts, the VVB also visited examples of other project activities that have been implemented wherever possible. They were sampled opportunistically with a focus on viewing at least one instance of each implemented project activity. For instance, the Project's nursery for project and community-based tree planting efforts was visited at the southern canal despite ARR activities have not been claimed for crediting this monitoring period.

2.5 Resolution of Findings

During the verification process, there was a risk that potential errors, omissions, and misrepresentations would be found. The actions taken when errors, omissions, and misrepresentations were found included: notifying the client of the issue(s) identified and expanding our review to the extent that satisfied the Lead Verifier's professional judgment.

The process of resolution of findings involved one formal round of assessment by the VVB. Findings were resolved during the verification by the Project Proponent implementing corrective actions such as amending the Monitoring Report and calculations, as well as and providing written responses. This resulted in project documentation that was in conformance with the requirements of the VCS Standard for GHG projects.

Findings were characterized in the following manner:

Non-Conformity Reports (NCRs)⁸ were issued as a response to material discrepancies in a part of the project and generally fell into one category:

- Non-conformity to a VCS guiding document listed in Section 2.1 above
- Consistency among project documentation or calculations was lacking
- Mathematical formulae were incorrect

⁸ No NCRs were issued as part of this 4th monitoring period verification.

- Additional information was required by the VVB to confirm reasonable assurance for compliance

Clarifications (CL) were issued when language within a project document needed extra clarification to avoid ambiguity.

Opportunities for Improvement (OFI) were issued to the Project Proponents when an opportunity for improvement was identified.

During the verification, eight (8) essential findings were identified. Detailed summaries of each finding, including the issue raised, responses, and final conclusions, are provided in Appendix B. All clarification requests (CLs) were satisfactorily addressed.

2.5.1 Forward Action Requests

One Forward Action Request was raised at the previous 3rd monitoring period verification pertaining to misunderstandings/grievances with Galinggang Village and requested that future verifiers see if progress has been made to clear up the misunderstandings/grievances. This village was re-visited in April 2019 to examine whether the misunderstanding regarding the purpose of the project was reinforced. Discussions were held by the audit team with individuals about the purpose of the project to ensure there was a reasonable understanding of its scope, the sort of community activities supported, and the process uniformly adopted to the extent possible for prioritizing community projects. A grievance box was noted where community members can express concerns related to the project and interviews in May 2019 indicated a higher level of receptiveness than the previous year. The Forward Action Request issued at the 3rd verification was fully satisfied.

One Forward Action Requests was raised during the 4th monitoring period verification. The project has strong mechanisms in place to take due account of on-going stakeholder input. A communication discrepancy was noted at villages Batuah and Hantipan related to project activities familiarity and minor misconceptions of the project for a portion of the local people. This is understood by the audit team to be in part due to securing a more recent ecosystem restoration concession for the western part of the project area (Unit 2). In addition, there are local tenure disagreements which has placed the project proponent in a position of mediation between two groups.

Active stakeholder consultation was witnessed during the site visit and these local groups participated in discussions with project staff where they were re-explained the goals, objectives, capacity, and activities of the project. The project continues outreach activities to all stakeholders, regardless of land tenure and representation. Mechanisms for ongoing communication with the local stakeholders to raise concerns during project implementation following the VCS Standard Section 3.17.3 are well established as confirmed in previous successful CCB verification. However, future verifiers are recommended to examine the progress of the project in terms of taking due account of input received during stakeholder consultation for appropriate adjustments of project implementation.

2.6 Eligibility for Validation Activities

Validation activities were not undertaken as part of the fourth monitoring period verification.

3 VALIDATION FINDINGS

Not applicable as the project is not undergoing validation at this time.

3.1 Participation under Other GHG Programs

The verification team is not aware of project involvement in other forms of environmental credits from its activities. The project has not been registered, and is not seeking registration, under any other GHG programs. Katingan Project currently only seeks carbon credits under the VCS program. This was confirmed through a risk-based internet review.

3.2 Methodology Deviations

No methodology deviations were applied to the project during this monitoring period.

3.3 Project Description Deviations

At this verification, the project has not applied any new PD deviations, but three PD deviations remain from previous monitoring periods. a) for use of the Advanced Land Observing Satellite Phased Array L-band Synthetic Aperture Radar 2 sensor (ALOS PALSAR 2) to monitor forest disturbances instead of multispectral Landsat imagery as described in the PD. b) Conservatively apply most aggressive annual clearance values from Global Watch data for leakage assessment when most recent data isn't published yet. c) PRA assumptions for illegal logging PD deviation applied at the first monitoring period (please see first Monitoring Report for details). Please see points below where the appropriateness of these deviations was evaluated:

a) PALSAR 2 – forest disturbance detection

- The deviation does not impact the applicability of the methodology as the intent is to monitor forest deforestation or disturbance which the new sensor provides
- Project additionality is not impacted
- The baseline scenario of acacia plantation conversion remains unaffected as the deviation affects monitoring efforts
- Project remains in compliance with the methodology as PALSAR data is an improvement in monitoring data for the period
- As satellite-based sensors often have a limited design lifespan the verification team also confirms this change in disturbance monitoring data is appropriate for future verification periods where L band radar satellite data are employed

b) Global Forest Watch data

- The deviation does not impact the applicability of the methodology as the intent is to monitor concession clearing activities
- Project additionality is not impacted
- The baseline scenario of acacia plantation conversion remains unaffected as the deviation affects leakage monitoring efforts
- Project remains in compliance with the methodology as applying the most aggressive annual concession clearing value is the most conservative application of leakage monitoring data for the period
- The VVB notes that following VM0007 accounting methods, monitored leakage must exceed baseline leakage for inclusion in final emission reduction estimates

c) Degradation PRA

The project did not complete a Participatory Rural Appraisal (PRA) to evaluate degradation during emission years 2012 and 2014 because the project assumed degradation took place. Please see first Verification Report and first Monitoring Report for additional details. The emissions resulting from the limited field survey following M-MON was included in the accounting for first monitoring period, year 2015.

The VVB confirmed that an adequate description and justification has been included in the MR for these PD deviations and they are appropriate.

3.4 Grouped Project

Not applicable as the project is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activities and Monitoring Plan, as described in the validated PD, have been initiated. There are no remaining issues from the validation. At this fourth monitoring period verification, many activities continue to be implemented, but the VVB observed ongoing progress during the verification site visit activities as reported in Section 2.1 of the Monitoring Report.

No material discrepancies were noted between the actual monitoring system, the monitoring plan set forth in the project description and the applied methodology, VM0007. Monitoring activities were demonstrated to follow Section 3 – Monitoring Plan of the Monitoring Report for the fourth monitoring period. Further, the verification team confirmed that Section 2.1 of the monitoring report provided an accurate description of the implementation of the project. The Verification Team requested to visit examples of all activities during the various site visit activities and subsequently confirmed the initial implementation of all items, as discussed in Section 2.1 of the Project's fourth Monitoring Report.

No new methodology deviations relating to monitoring and/or measurement of GHG emission reductions or removals were applied by the project developer/identified by ESI/Aster Global during this monitoring period verification (please see Section 3.2). No new PD deviations were applied during this period, but they are listed in Section 3.3. The GHG emission reductions generated by the project have not become included in an emissions trading program other than the VCS program and it has not received or sought any other form of environmental credit as confirmed through a risk-based review by the verification team.

The procedures outlined to estimate carbon stocks in specific pools within the project area, and the uncertainty of the estimates, have been implemented correctly. No minor errors in reporting of VCUs and calculation of net GHG reduction estimates were discovered in this fourth verification period. Updates because of monitored deforestation, degradation and fire were applied appropriately and market leakage was calculated correctly. Carbon stocks for pools by project activity were estimated in accordance with the methodology VM0007.

The project did not complete a Participatory Rural Appraisal (PRA) to evaluate degradation during emission years 2012 and 2014 because the project assumed degradation took place. Please see first Verification Report and first Monitoring Report for additional details. A PRA was conducted in 2017 at which time the project also conservatively assumed illegal logging had occurred and used the PRA to determine penetration distance. The emissions resulting from the limited field survey following M-MON was included in the accounting for the first and third monitoring reports, in 2015 and 2017 respectively, and any 2018 degradation emissions will be accounted for in the next PRA survey for the 2019 monitoring period.

Please see related details in *The Katingan Peatland Restoration and Conservation Project 3rd Verification Report (dated 10 August 2018)*, available on the VCS website.

Sustainable development contributions are applicable to this project although Indonesia has achieved 108 out of 169 Sustainable Development Goals. The project was confirmed to be actively supporting many UN SDGs as reported in Table 2 of the monitoring report through the site visit interviews and document review as part of the verification.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

ESI/Aster Global conducted an intensive review of all input data, parameters, formulae, calculations, conversions, statistics and resulting uncertainties and output data to ensure consistency with the VCS Standard, the validated PD, and VM0007. Data with associated conversion factors, formulas, and calculations were provided by the project proponent in spreadsheet format to ensure all formulae were accessible for review. The Verification Team recalculated subsets of the analyses to confirm correctness and assess if data transposition errors occurred to achieve a reasonable level of assurance and to meet the materiality requirements of the project, as required by Section 5.1.3 of the VCS Standard. The project proponent also provided answers to questions on calculations to ensure the verification team understood the approach and could confirm its consistency with VM0007 and the PD.

An overview of the data and parameters monitored, along with verification team findings, are included in the table below:

Data Unit / Parameter	Accuracy of GHG emission reductions and removals	Whether methods and formulae set out in the PD have been followed	Appropriateness of default values
$\Delta C_{WPS-REDD}$	Verification team confirmed the net GHG emissions in the REDD project scenario up to year t* were correct by recalculating and checking input values. The value was traced to the quantification of carbon stock changes for the baseline, project emission/removals and, ultimately net GHG emission	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.

	reductions during the monitoring period.		
$\Delta C_{LK-AS,planned}$	The net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation was confirmed by the verification team through an independent check on source data from Global Forest Watch. As NewR exceeds AdefLK, leakage is negative and therefore excluded from accounting and therefore 0.	This parameter was reviewed and re-calculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
ΔC_{LK-ME}	Net greenhouse gas emissions due to market-effects leakage is not applicable as project activities do not include timber production and therefore 0.	Not applicable.	Not applicable.
$\Delta C_{WPS-ARR}$	Net GHG emissions in the ARR project scenario up to year t* was found to be not applicable this period as no ARR activities have begun.	Not applicable.	Not applicable.
ΔC_{LK-ARR}	Net GHG emissions due to leakage from the ARR project activity up to year t* is not applicable as no displacement of pre-project agricultural activities (LK-ARR) is expected. The project will be planting a relatively small area in comparison to adjacent communities agroforestry activities. Further, the project is actively facilitating community forestry activities which are by definition not leakage.	Not applicable.	Not applicable.
$GHG_{WPS-WRC}$	Net GHG emissions in the WRC project scenario up to year t* was confirmed through sourcing of values from the validated PD. Independent re-calculation was	This parameter was reviewed and re-calculated using methods set forth in the methodology	Default factors were confirmed correctly obtained from the IPCC for Dissolved Organic Carbon

	performed to confirm correctness of values applied.	and the PD and confirmed followed.	(DOC).
GHG _{LK-ECO}	Net GHG emissions due to ecological leakage from the WRC project activity up to year t are not applicable this period. Ecological leakage was not applicable as no peat re-wetting activities occurred during the monitoring period and confirmed during the site visit.	Not applicable.	Not applicable.

For this monitoring period the project was unable to use the Advanced Land Observing Satellite Phased Array L-band Synthetic Aperture Radar 2 sensor (ALOS PALSAR 2) data to monitor and quantify forest disturbances due availability. The final selection of data sources applied to the LU/LC change analysis for this period used PlanetLabs multispectral imagery. The verification team observed a tutorial of methods during the site visit for generation of the 2018 disturbance detection analysis results and confirmed methods are in line with best practice for remote sensing. All data was confirmed to employ a maximum 30m resolution following M-MON requirements. The verification team reviewed the stratification analysis results independently and confirmed that data sources were found to be in good agreement, evidenced visually and from a confusion matrix.

Biomass burning did occur this monitoring period as confirmed from an independent check on NASA MODIS hotspot data and opportunistic sampling during the site visit (area adjacent to nursery). PlanetLabs high resolution imagery was used for the burnt area delineation which was independently confirmed through heads-up analysis by the audit team. The project has continued to assume conservatively decomposition of killed but un-combusted trees from year 2015. The methods to determine proportion of biomass burnt and the associated accuracy assessment were reviewed during a previous monitoring period. The VVB agrees with the initial verifier that a decay function, adjusted by proportion of live trees detected in burnt areas, is an appropriate method for emissions estimates of deadwood decomposition for burned areas where trees did not combust.

The project has monitored degradation through implementation of a PRA in 2018 which resulted in a degradation survey. Selective logging is N/A. At this monitoring period the project has included degradation ($\Delta C_{P, Deg, i, t}$) in accounting. One degradation buffer was confirmed re-drawn for the current monitoring period to account for a difference in area susceptible to degradation. As degradation was conservatively accounted for in entirety at the last monitoring period it is permissible to not be included in this monitoring period.

Activity shifting leakage was confirmed correct through sourcing of the data from Global Forest Watch which was found to be available for the year 2018. As noted in Section 4.3 of the Monitoring Report, tree cover loss was assumed a surrogate for deforestation. Project case leakage must exceed baseline leakage to be included in carbon accounting for activity shifting leakage.

Ecological leakage was not applicable as no peat re-wetting activities occurred during the monitoring period and confirmed during the site visit. No leakage following the displacement of pre-project agricultural activities (LK-ARR) is expected as the project will be planting a relatively small area in comparison to adjacent community's agroforestry activities. Further, the project is actively facilitating community forestry activities which are by definition not leakage. ARR crediting is not claimed this period, the project reports that ARR crediting is planned to start in 2020.

Uncertainty calculations for all project activities were reviewed at length as prescribed by the methodology and confirmed to result in a correct estimate of uncertainty. No uncertainty deduction was required for this monitoring period.

The methods and formulae set out in the PD for calculating baseline emissions, project emissions, and leakage were confirmed to have been followed. The total end of the 2018 monitoring period carbon stocks in all project activities for all relevant pools resulting from carbon stock changes were correctly quantified. Analysis of project inventory data used appropriate formulas, conversions, and parameters, supported by scientific literature. Where ranges of parameters exist, or other types of formulaic uncertainty, appropriately conservative values were used in data analysis.

In conclusion, the quantification methods for GHG emission reductions and removals have been performed correctly and in accordance with the validated PD and VM0007 v1.5.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

During this verification assessment, the evidence provided by the project proponent was sufficient in both quantity and quality to support the determination of GHG emission reductions reported by the project. Throughout the verification, the project proponent demonstrated a commitment toward conservativeness and took all measures appropriate to ensure the reliability of evidence provided.

The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals was met for this project as defined in the Verification Sampling Plan. Materiality is a concept that errors, omissions and misrepresentations could affect the GHG reduction assertion and influence the intended users (ISO 14064-3:2006). As defined by VCS Version 3, the materiality was 1% for this large project.

The evidence provided to determine emission reductions reported in the Monitoring Report included values, notations, units and sources. This evidence has been cross-checked with supplied emission reduction calculation spreadsheets. The procedure for data recording, transfer and final transposition was also verified and found to be in compliance with the monitoring plan outlined in the PD. The verification team confirmed through cross checks that adequate monitoring mechanisms are in place where the required parameters need to be monitored.

The verification team was provided access to the project's central database where monitoring data is compiled for quantification steps and reporting. The database clearly organizes project methods and data for efficiency. In addition, the verification team was provided access to the project's cloud-based file storage facility. These tools ensure accurate information flow for monitoring efforts. Section 3.3.1 of the Monitoring Report provides additional detail on project data management methods and structure.

Interviews conducted (oral evidence) are outlined in Section 2.3 above, and the final documents received from the Project Proponent supporting the determination of GHG removals can be viewed in Appendix A.

4.4 Non-Permanence Risk Analysis

The *Katingan Peatland Restoration and Conservation Project Monitoring Report* utilized the non-permanence risk analysis tool, AFOLU Non-Permanence Risk Tool, to assess risk according to internal risk, external risk, natural risk, and mitigation measures for minimizing risk. The verification team reviewed the Non-Permanence Risk Report following VCS AFOLU Requirements Section 3.7.3 and confirmed that the project adheres to the requirements set out in the VCS AFOLU Non-Permanence Risk Tool. At all levels, the verification team evaluated the rationale, appropriateness, and justifications of risk ratings chosen by the project proponent. Each risk factor was thoroughly assessed for conformance. Any identified NCR and/or CL findings related to the AFOLU Non-Permanence Risk Tool/Report are presented in Appendix B.

The final score was calculated to be 10%. A brief review of each factor is found in the table below:

Risk Factor	Rationale & Quality	Conclusion
Internal Risks		
Project Management	The management team includes individuals with skills necessary to undertake all project activities. Project proponents have experience in the development of carbon projects with the same project activities thus also lowering overall internal risk. Other project management components were confirmed to have been applied during the site visit.	A risk rating of -4 is appropriate given the rationale provided and all statements made are substantiated.
Financial viability	Project proponents provided the verification team appropriate and verifiable documentation to prove project financial breakeven is less than 4 years from this risk assessment. Items presented to the verification team by project proponents give reasonable assurance that the risk rating for financial viability is appropriately set. Values were sourced from reputable sources and calculations were confirmed correct through data checks.	A risk rating of 0 is appropriate given the rationale provided and all statements made are substantiated.
Opportunity Cost	A comprehensive NPV analysis was provided to substantiate the most profitable alternative (acacia plantation) is like the project scenario. The financial model was confirmed through materials that substantiate NPV assumptions including but not limited to; capex, opex, and commodity price changes. Literature sources	A risk rating of 0 is appropriate given the rationale provided.

	were found to be reputable (The World Bank, The Bank of Indonesia). Verifiers traced key values in the NPV calculations worksheet to confirm their source and correctness.	
Project Longevity	Legal contractual agreements to address enforceability of carbon stock protection for the project exist as the project holds licenses that cover the entire project lifetime. As such, the value applied was appropriate.	A risk rating of 0 is appropriate given the rationale provided.
Total Internal Risks		0
External Risks		
Land Tenure	For this Indonesian project the ownership and resource access/use are held by different entities. The government owns the land and the project retains ownership rights.	A risk rating of 2 is appropriate given the rationale provided.
Community Engagement	Extensive stakeholder consultation and community institution building was confirmed during the site visit. Consultation on community needs was confirmed for those communities visited that are close to the project area. The project, through partnerships (e.g. Puter Foundation), has strong intentions to improve the social and economic well-being of local communities.	A risk rating of -5 is appropriate given the rationale provided.
Political Risk	Verification Team confirmed the political risk to be rated correctly for the average governance score from the World Bank. Central Kalimantan, Indonesia participates in the Governors' Climate and Forest Taskforce and Indonesia is working on REDD+ Readiness activities as confirmed through an internet search.	A risk rating of 2 is appropriate given the rationale provided.
Total External Risks		0
Natural Risks		
Natural Risk	The risk rating given for fire ⁹ was justified by scientific research which supports the notion that fires in the project region are primarily	A combined natural risk rating of 2.0 is

⁹ At the first monitoring period anthropogenic fire risk was not included in the natural fire risk category following VCS guidance at the time. However, at the second monitoring period it was clarified from VCS on 29 June 2017 that all fire risk should be accounted for in the Natural Risk section.

	<p>anthropogenic and primarily affect drained peatlands. Natural fire incidence is low as the elevated water table in undrained peatlands prevents spreading. Previous fires in drained areas visited during the site visit were confirmed to be anthropogenic. The verification team agrees with this assessment as being appropriate.</p> <p>Verification Team agrees that the forests of the project area have a high species diversity and therefore resistant to catastrophic disturbance caused by insect pests or forest diseases.</p> <p>Project proponents appropriately base risk of extreme weather risk rating from the likelihood of wind disturbance which could influence carbon stocks.</p> <p>Local geology (i.e. volcanos, fault lines) are not active in the project area and the risk rating was appropriately given as zero.</p>	<p>appropriate given the rationale provided and all statements made are substantiated.</p>
Total Natural Risks		2.0
Overall Risk Rating = 2% Non-Permanence Risk Rating = 10%		

In summary, project proponents have accounted for risk factors in a reasonable manner and have reached an overall risk rating that encompasses all risks of non-permanence. The project has applied the minimum Non-Permanence Risk Rating of 10%. As required, risk will be reassessed and given risk scores at each verification period.

5 SAFEGUARDS

5.1 No Net Harm

No negative environmental impacts are expected because activities related to the project goals seek to preserve the peatland forests intact and prevent drainage. As confirmed through the site visit and previous CCB verifications, no negative socio-economic impacts are expected as the project has an extensive community outreach and development program. However, project failure can be expected to have negative impacts on project benefits which are captured by the Non-Permanence Risk assessment.

5.2 Local Stakeholder Consultation

Stakeholder involvement was confirmed through the site visit community interviews and observations of a consistent level of prior and on-going outreach to stakeholders. It is clear the project has ongoing communication with local stakeholders based on the results of on-site interviews where respondents indicated project details and program collaboration. Community institution building was also confirmed during the site visit where it was noted by the verification team that each village has specific needs and the project was helping to address them individually. Section 2.4.3.1 of the monitoring report provides details on formal stakeholder consultations. As community input was solicited from the project outset, and is on-going, it is expected that project activities will be implemented in close coordination with communities. Please also see Item #3 of Appendix B where the project has clarified it will encourage broader stakeholder representation and please also see Section 2.5.1 where a Forward Action Request is raised related to stakeholder consultation.

6 VERIFICATION CONCLUSION

After review of all project information, procedures, calculations, and supporting documentation, ESI/Aster Global confirms that the monitoring conducted by the project proponent, along with the supporting Monitoring Report, are accurate and consistent with all aforementioned VCS criteria, the validated PD, and the selected methodology (VM0007). ESI/Aster Global confirms that *The Katingan Peatland Restoration and Conservation Project Monitoring Report* (v1.0 dated 14 June 2019) has been implemented in accordance with the validated PD.

ESI/Aster Global confirms all verification activities including objectives, scope and criteria, level of assurance, monitoring and project documentation adherence to VCS Version 3 and all associated updates as documented in this report are complete. ESI/Aster Global concludes without any qualifications or limiting conditions that the *Katingan Peatland Restoration and Conservation Project Monitoring Report* (v1.0 dated 14 June 2019) meets the requirements of VCS Version 3 and all associated updates for the fourth monitoring period.

The GHG assertion provided by PT. Rimba Makmur Utama and verified by ESI/Aster Global has resulted in the GHG emissions reduction or removal of 5,703,688 tCO₂ equivalents by the project during the verification period/reporting period (01 January 2018 to 31 December 2018). This value is gross of the 10% (570,368 tCO₂ equivalents) buffer withholding based on the non-permanence risk assessment tool. This results in 5,133,319 tCO₂ equivalents of credits eligible for issuance as VCUs.

Verification period: From 1 January 2018 to 31 December 2018

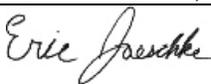
Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Deductions for AFOLU pooled buffer account (tCO ₂ e)	GHG credits eligible for issuance as VCUs (tCO ₂ e)**

2018	6,080,099	376,411	0	570,368	5,133,319
Total	6,080,099	376,411	0	570,368	5,133,319

**Note 10% risk deduction accounted for.

Submittal Information

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Report Submitted by:	<p>Aster Global Environmental Solutions, Inc. 3800 Clermont St. NW North Lawrence, OH 44666</p>
Aster Global Lead Verifier Name and Signature	<p></p> <p>Eric Jaeschke Lead Verifier</p>
Aster Global President Name and Signature	<p></p> <p>Janice McMahon President</p>
Date:	15 July 2019

EJ/JPM/VO17010.02_010_02_KatinganVCSVerReport_Final 20190715.doc
K pf 07/15/19f

APPENDIX A – DOCUMENTS RECEIVED/REVIEWED

Documents received 02 April 2019

- Katingan_AGB_stratification_2018
 - Katingan_AGB_stratification_2018_Final.shp
- Katingan_burnt_area_2018
 - Katingan_burntarea_2018.shp
- Katingan_deforestation_2018
 - Katingan_deforestation_2018.shp

Documents received 12 April 2019

- Katingan Project Fourth Monitoring Report 2018
 - Katingan Project_Fourth Monitoring Report_FINAL_12-Apr-19.docx
 - Katingan Project_Fourth Monitoring Report_FINAL_12-Apr-19.pdf
- MR-2018_Appendices & supporting files
 - Confidential Files
 - MR-2018_NPRA_Katingan Financial Model_CONFIDENTIAL_12-Apr-19.pdf
 - MR-2018_NPRA_Katingan Loan Agreement_CONFIDENTIAL_12-Apr-19.pdf
 - MR-2018_NPRA_Katingan NPV Analysis_CONFIDENTIAL_12-Apr-19.xlsx
 - MR-2018_Appendix 2_Climate MRV Tracker_12-Apr-19.xlsx
 - MR-2018_Appendix_1_NPRA_12-Mar-19 (pdf).pdf
 - MR-2018_Appendix_1_NPRA_12-Mar-19 (word).docx
 - MR-2018_Emissions Master Spreadsheet_12-Apr-19.xlsx
 - MR-2018_Monitoring Result_12-Apr-19.xlsx
 - MR-2018_NPRA_Political Risk World Bank Indicators_12-Apr-19.xlsx
 - MR-2018_Uncertainty Spreadsheet_12-Apr-19.xlsx

Documents received 22 April 2019

- List of attendees ESI Audit for VCS&CCB - 22 Apr 2019.pdf
- VCS audit itinerary_22 April 2019.xlsx

Documents received 23 April 2019

- WRC_Strata_2018
 - WRC_Strata_2018.shx
 - WRC_Strata_2018.cpg
 - WRC_Strata_2018.dbf
 - WRC_Strata_2018.prj
 - WRC_Strata_2018.sbn
 - WRC_Strata_2018.sbx
 - WRC_Strata_2018.shp
 - WRC_Strata_2018.shp.xml
- Fires
 - Katingan_Burnt_Area_2018
 - burned_2018_per_strata.shx
 - burned_2018_per_strata.cpg
 - burned_2018_per_strata.dbf
 - burned_2018_per_strata.prj
 - burned_2018_per_strata.sbn
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 - firespots_MODIS_2018.cpg
 - firespots_MODIS_2018.dbf

- firespots_MODIS_2018.prj
- firespots_MODIS_2018.sbn
- firespots_MODIS_2018.sbx
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- firespots_MODIS_2018.shp.xml
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- Historical
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- burnt_15.shp.PERM-LON-LAP005.15880.9044.sr.lock
- burnt_15.shp.xml
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- burnt_times_2018_pre2018_aggregated.tif
- burnt_times_2018_pre2018_aggregated.tif.aux.xml
- burnt_times_2018_pre2018_aggregated.tif.ovr
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- Katingan_2018_area_deforested

- Katingan_area_deforested_2018.shx
- Katingan_2018_area_deforested.kml
- Katingan_area_deforested_2018.cpg
- Katingan_area_deforested_2018.dbf
- Katingan_area_deforested_2018.prj
- Katingan_area_deforested_2018.qpj
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 - points_non_forest.shp
 - points_non_forest.shp.PERM-LON-LAP005.15880.9044.sr.lock
 - points_non_forest.shp.xml
 - points_non_forest.shx
 - Updated_stratification_2018.cpg
 - Updated_stratification_2018.dbf
 - Updated_stratification_2018.prj
 - Updated_stratification_2018.sbn
 - Updated_stratification_2018.sbx
 - Updated_stratification_2018.shp

Documents received 24 April 2019

- Katingan Emission Calculations 2010-2015_Master Spreadsheet_REVISSED_07-Jul-16.xlsx

Documents received 01 May 2019

- Katingan NPV Analysis_60-Year Projection_Updated to end-2018_CONFIDENTIAL_29-Apr-19_Revised.xlsx

Documents received 14 June 2019

- Katingan Project_Fourth Monitoring Report_REVISSED_14_June_19_clean.docx
- Katingan Project_Fourth Monitoring Report_REVISSED_14_June_19_clean.pdf
- Katingan Project_Fourth Monitoring Report_REVISSED_14_June_19_tracked_changes
- VO17010_02_Katingan_verif_VCS_round 1 findings_response

APPENDIX B – CL/OFI

Item Number	1
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Section)	3.6 PROJECT DESCRIPTION DEVIATIONS
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	3.6.1 Deviations from the project description are permitted at verification. The procedures for documenting the deviation depend on whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Interpretation of whether the deviation impacts any of these shall be determined consistent with the CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD, mutatis mutandis. The procedures are as follows:
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR Section 2.2.2
ESI Findings - Round 1 (23 May 2019)	<p>At this verification the project has elected to apply a PD a deviation for conservative application of 2012 Global Watch data for leakage assessment. This is reasonable and acceptable. However, the audit team understands that previous PD deviations (use of the Advanced Land Observing Satellite Phased Array L-band Synthetic Aperture Radar 2 sensor (ALOS PALSAR 2) to monitor forest disturbances instead of multispectral Landsat imagery as described in the PD for monitoring period 3 - 2017) should be reported in the MR following the VCS MR template (VCS Monitoring Report Template, v3.4-19Oct2016.doc).</p> <p>Also, the audit team noted that this language in Section 4.2.7 of the MR requires revision, "At the time of writing data from GFW for the calendar year 2018 was unavailable" as it is understood that 2018 Global Forest Watch data is available currently.</p> <p>A spelling error was noted within Table 2 of the MR.</p>
Round 1 NCR/CL/OFI	CL: Please report the previous PD deviation in the MR in line with VCS template requirements as noted in the finding. Please also revise the language as noted in the finding in Section 4.2.7 of the MR.
Round 1 Response from Project Proponent (14 June 2019)	Spelling error fixed, Previous PD deviations have been included in the updated Monitoring Report and the Leakage language has been updated accordingly

ESI Findings - Round 2 (27 June 2019)	All previous PD deviations are now reported in Section 2.2.2 of the MR. No further action is needed. The item is addressed.
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Item Number	2
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Section)	3.16 MONITORING
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	3.16.6 The monitoring report describes all the data and information related to the monitoring of GHG emission reductions or removals. The project proponent shall use the VCS Monitoring Report Template, VCS Joint Project Description & Monitoring Report Template, VCS & CCB Monitoring Report Template or VCS+SOCIALCARBON Monitoring Report Template, as appropriate, and adhere to all instructional text within the template.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	VCS supplied templates
ESI Findings - Round 1 (23 May 2019)	The project has appropriately applied the most recent VCS only monitoring report template "VCS Monitoring Report Template, v3.4-19Oct2016.doc". Additional relevant sections were added by the proponent under higher level section headings, this is reasonable and allowable. However, the audit team noted that Sections 4.2 - 4.4 of the MR do not currently follow the VCS template and slight adjustments are required.
Round NCR/CL/OFI 1	CL: Please adjust the sections headings as noted in the finding to align with the VCS MR template
Round 1 Response from Project Proponent (14 June 2019)	Section headings have been adjusted according to the VCS MR template
ESI Findings - Round 2 (27 June 2019)	Section headings have been fixed appropriately in line with the required VCS template. The item is addressed.

Item Number	3
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Section)	Local Stakeholder Consultation

VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	3.17.3 The project proponent shall establish mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR Section 2.4.3.1
ESI Findings - Round 1 (23 May 2019)	Stakeholder consultation is an active component of the project as evidenced during the 4th VCS site visit. Interviews on-site suggested that proponent staff have a preference to visit or conduct meetings with a repeat village representative. The audit team understands this approach to be acceptable for early stakeholder consultation, but later implementation requires broader and representable outreach activities.
Round 1 NCR/CL/OFI	1 CL: Please clarify the project design which allows for broader stakeholder representation as noted in the finding.
Round 1 Response from Project Proponent (14 June 2019)	The project strives to ensure consultations held in all villages reach beyond the circle of the village leadership, however as with all aspects of the project, there is room for further improvement. We will continue to seek new ways to increase the number of opportunities that community members have to receive project information, to ask questions, and to provide comments. We have revised the SoPs regarding the dissemination of information to communities to include additional required community meetings at the RT level and with minority groups, such as women, youth and the elderly but we will invest further resources in staff training to ensure these SoPs are followed more carefully in all circumstances.
ESI Findings - Round 2 (27 June 2019)	The verification team recognizes the challenges encountered by projects of a scope such as Katingan. The response from the proponent indicates ongoing progress towards stakeholder engagement of all groups. Mechanisms are in place to satisfy the requirement. The item is addressed.

Item Number	4
VCS AFOLU Requirements 21 June 2017, v3.6 (Section)	4.7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	* Where the net change in carbon stocks is not a whole number, round the calculated VCU and buffer credit volumes down to the nearest whole number. Where the net change in carbon stocks is a whole number, round the calculated buffer volume up, and the VCU volume down, to the nearest whole number.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	Katingan Emission Calculations 2018 Master worksheet; MR Section 4.4.7
ESI Findings - Round 1 (23 May 2019)	The VVB noted in review of the final estimated VCU calculations and reporting that this decimal guidance was followed appropriately. However, the audit team noted that a consistent decimal convention did not appear to have been followed in calculation worksheets where data is transcribed from different sources. An Opportunity for Improvement (OFI) is issued but no action is required of the project proponent.
Round 1 NCR/CL/OFI	1 OFI: The proponent is suggested to maintain a consistent decimal convention for project calculations.
Round 1 Response from Project Proponent (14 June 2019)	The calculations' decimal consistency will be addressed in future monitoring reports
ESI Findings - Round 2 (27 June 2019)	No further action is needed. The item is addressed.

Item Number	5
VCS Methodology VMD0009 Version 1.2 9 March 2015 Sectoral Scope 14 Estimation of emissions from activity shifting for avoiding planned deforestation and planned degradation (LK-ASP) (Section)	6.2 Data and Parameters Monitored
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	The total area of deforestation by the baseline agent or class of agent of the planned deforestation in stratum i at time t (AdefLK,i,t)
Applicability to Project (Y or N/A)	Y

Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR
ESI Findings - Round 1 (23 May 2019)	The highest Adef value was applied from prior years (2012) from the Global Forest Watch dataset. This is reasonable and conservative, in line with a previously approved PD deviation. However, the MR erroneously reports that 2018 data was not available.
Round 1 NCR/CL/OFI	CL: Please ensure the language in the MR regarding Global Watch Forest data availability is corrected.
Round 1 Response from Project Proponent (14 June 2019)	The leakage calculations have been updated using the recently published GlobalForestWatch 2018 deforestation data. Per the updated numbers, no leakage occurred during the 2018 monitoring period
ESI Findings - Round 2 (27 June 2019)	Leakage calculation results were confirmed reported correct in Section 4.3.1 of the MR. The item is addressed.

Item Number	6
Approved VCS Module VMD0015, Version 2.1 (20 November 2012), REDD Methodological Module: Methods for monitoring of greenhouse gas emissions and removals (M-MON), Sectoral Scope 14 (Section)	5.3 STEP 3: Documentation
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	a. Data sources and pre-processing: Type, resolution, source and acquisition date of the remotely sensed data (and other data) used; geometric, radiometric and other corrections performed, if any; spectral bands and indexes used (such as NDVI); projection and parameters used to geo-reference the images; error estimate of the geometric correction; software and software version used to perform tasks; etc.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR Section 3.3.3.1; 4.2.2.1

ESI Findings - Round 1 (23 May 2019)	<p>Section 3.3.3.1 and 4.2.2.1 of the MR describes the PlanetLabs data source used for this period and other details on the remote sensing approach. The information provided in the MR appears incomplete following this requirement, for example these elements were noted as missing:</p> <ul style="list-style-type: none"> -Actual resolution of the Planet Labs data -Description of pre-processing steps performed (if any)
Round NCR/CL/OFI 1	CL: Please ensure this requirement is satisfied through reporting the necessary information regarding data sources and pre-processing.
Round 1 Response from Project Proponent (14 June 2019)	Additional detail on the PlanetLabs data and pre-processing workflow were added to the Monitoring Report
ESI Findings - Round 2 (27 June 2019)	The information now provided in Section 3.3.3 and 4.2.2 of the MR is sufficient to satisfy the request and requirement. The item is addressed.

Item Number	7
Approved VCS Module VMD0015, Version 2.1 (20 November 2012), REDD Methodological Module: Methods for monitoring of greenhouse gas emissions and removals (M-MON), Sectoral Scope 14 (Section)	5.3 STEP 3: Documentation
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	b. Data classification: Definition of the classes and categories; classification approach and classification algorithms; coordinates and description of the ground-truth data collected for training purposes; ancillary data used in the classification, if any; software and software version used to perform the classification; additional spatial data and analysis used for post-classification analysis, including class subdivisions using non-spectral criteria, if any; etc.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR Section 3.3.3.1; 4.2.2.1

ESI Findings - Round 1 (23 May 2019)	Section 3.3.3.1 and 4.2.2.1 of the MR describes the data classification as unsupervised and other details on the remote sensing approach. The information provided in the MR appears incomplete following this requirement, for example these elements were noted as missing: -Description of additional steps during classification process (e.g. polygon delineation and analyst determinations of select areas post-unsupervised classification)
Round 1 NCR/CL/OFI	CL: Please ensure this requirement is satisfied through reporting the necessary information regarding data classification.
Round 1 Response from Project Proponent (14 June 2019)	Additional detail on the analysis workflow and classification process were included in the updated Monitoring Report
ESI Findings - Round 2 (27 June 2019)	The information now provided in Section 3.3.3 and 4.2.2 of the MR is sufficient to satisfy the request and requirement. The item is addressed.

Item Number	8
Approved VCS Module VMD0015,Version 2.1 (20 November 2012), REDD Methodological Module: Methods for monitoring of greenhouse gas emissions and removals (M-MON), Sectoral Scope 14 (Section)	5.3 STEP 3: Documentation
VCS Standard VCS Version 3 Requirements Document 21 June 2017, v3.7 (Description)	c. Classification accuracy assessment: Accuracy assessment technique used; coordinates and description of the ground-truth data collected for classification accuracy assessment; and final classification accuracy assessment.
Applicability to Project (Y or N/A)	Y
Requirement Met (Y, N or Pending)	Y
Evidence Used to Assess (Location in PD/MR or Supporting Documents)	MR Section 4.2.2.1
ESI Findings - Round 1 (23 May 2019)	The verification team examined the accuracy assessment for deforestation. It was noted that the same dataset was used for the accuracy assessment as the classification effort. Clarification is requested on whether this is appropriate. Additional details are requested in reporting documentation following this requirement.

<p>Round NCR/CL/OFI</p>	<p>1 CL: Please address the findings and clarify the source of accuracy assessment data. Please also include additional detail in reporting documentation to describe the accuracy assessment.</p>
<p>Round 1 Response from Project Proponent (14 June 2019)</p>	<p>The PlanetLabs data used for the deforestation assessment is the highest resolution data currently available to the project. Traditionally, a higher resolution datasource would be used to conduct the accuracy assessment, but as no such data was available the high resolution PlanetLabs data was also used to conduct the accuracy assessment. Additional detail on the accuracy assessment and resulting confusion matrix were added to the Monitoring Report.</p>
<p>ESI Findings - Round 2 (27 June 2019)</p>	<p>The information now provided in Section 3.3.3 and 4.2.2 of the MR is sufficient to satisfy the request and requirement. The item is addressed.</p>