ESTIMATION OF BASELINE GREENHOUSE GAS EMISSIONS WITHIN THE PROJECT AREA AND LEAKAGE BELT FROM UNPLANNED DEFORESTATION (BL-UD)

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CONTENTS

1 SOURCES

This module uses the latest version of the following modules and tools:

- Module J-ADB-UD - Determination of jurisdictional activity data baseline for unplanned deforestation
- JNR Risk Mapping Tool
- JNR Allocation Tool
- Module LK-UD-AS - Estimation of emissions from activity shifting for avoiding unplanned deforestation

The relevant sources employed by this module will be listed in each relevant VCS methodology.

2 SUMMARY DESCRIPTION OF THE MODULE

This module allows for estimating baseline emissions from carbon stock changes and GHG emissions related to unplanned deforestation within the project boundary and the area directly around the project, defined through a leakage belt, in the baseline scenario (VCS eligible categories AUD, combined AUD-AUWD, and combined AUD-RWE).

When applying BL-UD module, the activity data for baseline unplanned deforestation in the unplanned deforestation project area and leakage belt generated by Verra by applying the module J-ADB-UD and the emission factors generated by project proponents applying this BL-UD module are employed to estimate the emission from carbon stock changes and GHG emissions within the AUD (or AUD-AUWD or AUD-RWE) project area and AUD (or AUD-AUWD or AUD-RWE) leakage belt. Hereinafter, when referring to “AUD”, “combined AUD-AUWD” or “combined AUD-RWE” is intended, where relevant.

When applying the BL-UD module for locations on wetlands, disregard the references to calculations associated with the soil pool, set the soil pool to zero, and instead use the methods contained in the relevant methodology for soil GHG accounting associated to tidal wetlands and peatlands.

3 DEFINITIONS

3.1 Definitions

In addition to the definitions set out in the VCS Program document *Program Definitions* and the relevant VCS methodology, the following definitions apply:

Activity Data (AD)
The area of deforested or degraded forest registered in a specific area over a given period

Avoided unplanned deforestation project area (AUD-PA)
The discrete parcel(s) which, at the start of the project, are under threat of unplanned deforestation, and on which the project developers will undertake the project activities at the start date of the AUD project activity. The AUD-PA remains fixed for the duration of the project crediting period.

Avoided UD leakage belt (AUD-LB)
The discrete parcel(s) surrounding the AUD-PA in which, at the start of the project, unplanned deforestation in the AUD-PA may potential be displaced because of AUD project activities. The AUD-PA remains fixed for the duration of the project crediting period

Jurisdiction
The spatial extent for which AD are estimated and forest cover benchmark maps (FCBMs) are created using module J-ADB-UD. It encompasses all project and non-project areas.

Jurisdictional activity data baseline for unplanned deforestation validity period (JBVP)
The period of time during which the jurisdictional activity data baseline shall be considered valid. The length of the validity period shall be 6 years and shall be delineated with explicit references to the start and end dates (day, month, and year) according to module J-ADB-UD.

3.2 Acronyms

Acronyms used in naming variables that are not used in the text of the module are not listed here. Definitions of each variable are included following the applicable formula and in Section 6 of this module for easier reference.

AD	Activity Data
AFOLU	Agriculture, Forestry and Other Land Use
AUD	Avoided Unplanned Deforestation
AUWD	Avoided Unplanned Wetland Degradation

FCBM	Jurisdictional Forest Cover Benchmark Map
FCBMp	Project-specific Jurisdictional Forest Benchmark Map
GPS	Global Positioning System
JBVP	Jurisdictional Activity Data baseline for Unplanned Deforestation validity period
LCT	Land Cover Transition
QA/QC	Quality assurance/quality control
RWE	Restoration of Wetland Ecosystems
SOC	Soil organic carbon
UD	Unplanned Deforestation

For definitions of VCS AFOLU project categories refer to the *VCS Standard.*

4 APPLICABILITY CONDITIONS

The module is applicable for estimating baseline emissions from unplanned deforestation (land use transition of forest[1] land to non-forest land in the baseline case). This can include unplanned deforestation on forested wetlands but does not apply to non-forested wetlands.

The entire AUD project boundary must be contained within Jurisdiction(s) with an approved J-ADB-UD Description Report prior to the project start date.

Application of this module cannot be completed until Verra has developed activity data for the jurisdiction for the JBVP and allocated it to projects through the delivery of an activity data baseline Allocation Report.

For further information regarding the allocation process, please refer to J-ADB-UD module.

[1] Mangrove forests are excluded from any tree height requirement in a forest definition, as they consist of (close to) 100% mangrove species, which often do not reach the same height as other tree species and occupy contiguous areas, and their functioning as a forest is independent of tree height.

5 PROCEDURES

The project baseline will be developed using the following procedure. The baseline must be revisited at fixed intervals, which must be aligned with the JBVP listed in the validated J-ADB-UD Description Report.

5.1 Definition of Boundaries

The analytical domain from which information on the project baseline levels of unplanned deforestation and resulting GHG emissions within the project boundaries and AUD leakage belt must be delineated spatially and temporally.

In addition to the guidance within the relevant VCS methodologies for AUD, the following boundaries shall be defined.

5.1.1 Geographic Boundaries of Avoided Unplanned Deforestation project area (AUD) and AUD Leakage Belt

5.1.1.1 AUD Project Area

For Projects where multiple AFOLU project activities are being implemented within the project boundary other than unplanned deforestation (e.g., ARR), the discrete areas where each of these activities are implemented must be spatially delineated.

For unplanned deforestation, the AUD project area is the discrete parcel(s) of land at risk of unplanned deforestation in the baseline scenario in which the project developers will undertake the project activities and that qualifies as forest land at the start date of the AUD project activity. The entire AUD project area must meet the forest definition at the project start date. The boundaries of the AUD project area remain fixed for the duration of the project crediting period, irrespective of any land cover change that may transpire after the start of the AUD project activity.

5.1.1.2 AUD Leakage Belt

To estimate the displacement of forest land cover transitions to the areas directly surrounding the AUD project area by geographically constrained agents, a ‘leakage belt’ is delineated within module LK-UD-AS.

5.1.2 Temporal boundaries

The following temporal boundaries must be defined:

- Start date and end date of each project baseline validity period. Each project baseline validity period must be fully aligned with the respective JBVP. If the project start date is defined as a later date than the start date of the then active JBVP, the first project

baseline validity period will be the project start date through the end of the respective JBVP. Subsequent project baseline validity periods will be equal to the JBVP until the end of the project crediting period.

- The start date and end date of the AUD project crediting period are determined per the applicable VCS AUD methodology and the latest version of the *VCS Standard*.

5.2 Creation of project Forest Cover Benchmark Maps (FCBMp)

Prior to the start date of a respective JBVP, the project may choose to develop project-specific FCBMp to submit to Verra for assessment and possible integration into the jurisdictional FCBM contained in J-ADB-UD Description Report.

If a project chooses to develop an FCBMp, it must encompass both the AUD-PA and AUD-LB plus an additional 10km buffer surrounding the leakage belt, and represent the current and historical time periods required by the JNR Risk Mapping Tool.

If a project chooses not to develop a FCBMp, the application of the JNR Risk Mapping Tool and JNR Allocation Tool by Verra will rely on Jurisdictional FCBMs encompassing the AUD-PA and AUD-LB solely developed by Verra. Verra will reach a decision on whether or not to integrate an FCBMp into the Jurisdictional FCBM based on a validation dataset. Details on this are provided in module J-ADB-UD, Section 5.5.3.

5.3 Creation of project Forest Stratification Map

Project proponents can define the Forest Strata that will be employed in emissions calculations for each land cover transition within the AUD project area and the AUD leakage belt. These Forest Strata are relevant for estimating different forest carbon stocks and non-forest carbon stocks. Where wetland soils exist within the AUD Project area and/or the AUD leakage belt, these must be delineated as strata.

If a project proponent does not want to apply different emission factors, no FCBM is required. However, if the project stratifies forest classes for the purpose of applying different emission factors, a forest stratification map depicting those forest classes must be developed or adopted. The project forest stratification map shall:

- Be identical to, or directly derived from, the spatial stratification utilized in the estimation of project carbon stocks through forest inventories (e.g., a map with a higher number of classes used for forest inventories may be simplified by combining classes after the analysis of the inventory is complete).
- Encompass the AUD-PA and AUD-LB and use the same set of forest strata definitions between both areas.
- Be utilized by MON-AUD to associate sample plot observations of activity data categories (AD-C) with forest strata.

- Identify a forest stratum for all areas mapped as Forest in the latest year of the FCBM time series.

Within the leakage belt (but not within the PA), a project proponent may define and delineate a stratum to encompass forests where any clearing is highly likely to be caused by drivers other than the unplanned deforestation drivers that the PA is subject to. This stratum would typically represent intensively managed plantation forests where clearing would lead to a temporarily unstocked forest, rather than permanent deforestation. If included, this stratum *i* shall be referred to as "non-AUD".

There is no accuracy standard applied to the project Forest Stratification Map. Any error in the spatial accuracy of classes will be reflected in the calculation of uncertainty around inventoried carbon stocks for each mapped stratum.

In the event that a large-scale natural disturbance[2] is identified during Monitoring to take have taken place within the AUD Project area and/or AUD leakage belt over the baseline validity period, the area disturbed shall be delineated and treated as a separate forest strata. The application of this BL-UD module shall then be updated.

5.4 Estimation of baseline Annual Area of unplanned deforestation within AUD Project Boundary

The projected baseline area for each UD Activity land cover transition class within each Risk Class in the AUD Project area and leakage belt is produced through the application of module J-ADB-UD, the JNR RMT and JNR AT, and provided to projects by Verra through the activity data baseline Allocation Report as $AD_{PA,LCT,p,i}$ and $AD_{LB,LCT,p,i}$.

Where:

$AD_{PA,LCT,p,i,}$	Portion of the Jurisdictional activity data baseline allocated to AUDproject Area of a given project *p*, in land cover transition class *LCT*, in risk class *i*, ha
$AD_{LB,LCT,p,i,}$	Portion of the Jurisdictional activity data baseline allocated to AUD leakage belt of a given project *p*, in land cover transition class *LCT*, in risk class *i*, ha
LCT	1,2,3…LCT* land cover transition classes
p	1,2,3…P AUD projects requesting allocation of a portion of the activity data baseline within the JBVP
i	1,2,3…I Risk Class

[2] Such as tectonic activity (earthquake, landslide, volcano), extreme weather (hurricane), pest, drought, or fire that result in a significant degradation of forest carbon stock.

In order to perform the procedures defined in Section 5.4.1, projects need to have received the following activity data information from Verra through the delivery of an activity data baseline Allocation Report:

- The table containing AD allocation to each risk class for the PA and LB for the JBVP.
- The Jurisdictional FCBMs.
- The Jurisdictional Risk Map.

The $AD_{PA,LCT,p,i}$ and $AD_{LB,LCT,p,i}$ values contained in the project-specific tables are assigned the parameter names $AD_{PA,LCT,r,t}$ and $AD_{LB,LCT,r,t}$.

Where:

$AD_{PA,LCT,r,t}$	Portion of the Jurisdictional activity data baseline allocated to AUD Project area, in land cover transition class *LCT*, in risk class *r*, in project year *t*; ha
$AD_{LB,LCT,r,t}$	Portion of the Jurisdictional activity data baseline allocated to AUD leakage belt, in land cover transition class *LCT*, in risk class *r*, in project year *t*; ha
LCT	1,2,3…LCT* land cover transition classes
r	1,2,3…R Risk Class
t	*1,2,3…t* year of the J-ADB-UD validity period

5.4.1 Allocation of activity data to forest strata within AUD Project area

The annual area of each baseline UD Activity land cover transition Class ($AD_{PA,LCT,r,t}$, $AD_{LB,LCT,r,t}$) shall be allocated among forest strata within the AUD Project area ($A_{PA\text{-}UD\ \text{-}forest}$) and AUD leakage belt ($A_{LB\text{-}UD\ \text{-}forest}$).

Forest strata are defined in Section 5.4, Step 2. If multiple forest strata are utilized, activity data must be allocated to each forest stratum using estimates of the proportional distribution of project forest strata within risk classes.

The areas of forest in each risk class *r*, and forest stratum *i*, for the PA and LB are termed $A_{PA\text{-}UD\ ,r,i}$ and $A_{LB\text{-}UD\ ,r,i}$. These parameters shall be calculated by spatial overlay of the following layers:

- Digital Maps of AUD Project area Boundaries.
- Digital Maps of AUD leakage belt Stratified Forest.
- Project Forest Stratification Map.
- Jurisdictional Risk Map.

AD allocation to forest strata is calculated as follows:

If only one forest stratum is utilized:

$$AD_{BSL,PA-UD,LCT,i,t} = \frac{1}{JVP} \times \sum_{r=1}^{R} AD_{PA,LCT,r,t} \quad (1)$$

$$AD_{BSL,LB-UD,LCT,i,t} = \frac{1}{JVP} \times \sum_{r=1}^{R} AD_{LB,LCT,r,t} \quad (2)$$

If multiple forest strata are utilized:

$$AD_{BSL,PA-UD,LCT,i,t} = \frac{1}{JVP} \times \sum_{r=1}^{R} (AD_{PA,LCT,r,t} \times \frac{A_{PA-UD,r,i}}{\sum_{i=1}^{M} A_{PA-UD,r,i}}) \quad (3)$$

$$AD_{BSL,LB-UD,LCT,i,t} = \frac{1}{JVP} \times \sum_{r=1}^{R} (AD_{LB,LCT,r,t} \times \frac{A_{LB-UD,r,i}}{\sum_{i=1}^{M} A_{LB-UD,r,i}}) \quad (4)$$

Where a "non-UD" stratum is utilized:

$$AD_{BSL,LB-UD,LCT,i=non-UD,t} = 0 \quad (5)$$

Where:

$AD_{BSL,PA\text{-}UD,LCT,i,t}$	UD Activity data in the AUD Project area allocated to land cover transition *LCT* in forest stratum *i*, in year *t*; ha y^{-1}
$AD_{BSL,LB\text{-}UD,LCT,i,t}$	UD Activity data in the AUD leakage belt allocated to land cover transition *LCT* in forest stratum *i*, in year *t*; ha y^{-1}
$AD_{PA,LCT,r,t}$	Projected annual activity data allocated to AUD Project area *pa* for land cover transition *LCT* in Risk Class *r* in the Jurisdiction, in project year *t*; ha y^{-1}
$AD_{LB,LCT,r,t}$	Projected annual activity data allocated to AUD leakage belt *LB* for land cover transition *LCT* in Risk Class *r* in the Jurisdiction, in project year *t*; ha y^{-1}
$A_{PA\text{-}UD,r,i}$	Area of forest in the AUD Project area at the start of JBVP in Risk Class *r* in forest stratum *i*; hectares
$A_{LB\text{-}UD,r,i}$	Area of forest in the AUD leakage belt at the start of JBVP in Risk Class *r* in forest stratum *i*; hectares
JBVP	Length of the JBVP, years
LCT	1,2,3…LCT* land cover Transitions

i	1,2,3…M forest strata
r	0,1,2…R Risk Classes
t	1,2,3…t* years elapsed since the start of the AUD project Activity

Allocation of AD to the non-UD stratum of the leakage belt is always zero.

5.5 Estimation of Emissions from carbon stock changes

The carbon stocks before and after land cover transition for the forest strata within the AUD Project area and AUD leakage belt shall be estimated. The change in carbon stocks resulting from each land cover transition within each forest stratum shall then be calculated. Carbon stocks are not estimated for the non-UD stratum of the leakage belt, and this stratum is excluded from all subsequent steps.

Step 1: Estimation of (non-wetland) carbon stocks per forest stratum

Estimation of forest carbon stocks

The procedures for sample design and measurement procedures for each forest carbon pool are specified in the methodology or associated carbon pool module within the methodology. The sample design must be demonstrated to be unbiased and derived from representative sampling. The sampling should be representative of the areas expected to be included in the AUD Project area over the project baseline validity period.

The measurement procedures must ensure accuracy of measurements through adherence to best practices and quality assurance/quality control (QA/QC) procedures. The measurement procedures, including QA/QC procedures must be outlined in Standard Operating Procedures governing field data collection.

In instances where the leakage belt contains forest strata not found within the AUD Project area, it is allowable to use carbon pool estimates from a national dataset (e.g. FREL or National Forest Inventory) or peer-reviewed published source.

Estimation of non-forest carbon stocks

The carbon stocks of forest land following land cover transition are assumed to be the area-weighted average stocks of non-forest land use classes present in the area surrounding the project (e.g. within an area of 5 km of the AUD project boundary) at the beginning of the JBVP, referencing the most current land use/land cover classification covering the jurisdiction. However, it is also allowable to include only the subset of these land uses that are relevant to the baseline scenario identified through the application of the VCS Additionality Tool. Stock estimates of each non forest land use class represented must be

equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow), sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 10 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.[3]

Step 2: Estimation of emissions from carbon stock changes

For non-wetland carbon pools, stock changes in each pool, ΔC_p, are calculated by subtracting the post-land use transition carbon stocks from forest carbon stocks. Subsequently, stock change parameters are discounted in case of high uncertainty to derive conservatively estimated stock change, ΔCc_p.

The stock changes are calculated, for each LCT and forest stratum and each pool (except wetland soils) for each land cover transition separately, as follows:

$$\Delta C_{p,LCT,i} = C_{p,LCT,i,bsl} - C_{p,LCT,i,post} \quad (6)$$

Where:

$\Delta C_{p,LCT,i}$	Emissions from carbon stock change in in land cover transition LCT in stratum *i*, pool *p*; t CO_2-e ha^{-1}
$C_{p,LCT,i,bsl}$	Forest carbon stock estimate in in land cover transition LCT in stratum *i*, pool *p*; t CO_2-e ha^{-1}
$C_{p,LCT,i,post}$	Post land use transition carbon stock estimate in in land cover transition LCT in stratum *i*, pool *p*; t CO_2-e ha^{-1}
LCT	1,2,3…LCT* land cover Transitions
i	1, 2, 3, … *M* strata

In the situation where the baseline includes harvesting of long-lived wood products, the methods described in the relevant VCS methodology shall be used to calculate the carbon stock sequestered in wood products.

[3] It is possible that the post-deforestation vegetation is variable and a conservative estimate would be obtained by selectively sampling the vegetation to represent the maximum C stocks present.

Step 3: Estimation of uncertainty in estimating carbon stocks

Each measurement of forest carbon stocks and non-forest carbon stocks for each carbon pool must include an estimate of its uncertainty. The percent uncertainty of each carbon stock estimate is defined as the half width of the two-sided 90% confidence interval divided by the estimate. For estimating the uncertainty, the following minimum requirements apply:

- Where carbon stock estimates are derived from sampling (for example, measuring above-ground biomass or other carbon pools in sample plots), the sampling uncertainty must be taken into account;
- Where literature sources (including IPCC guidance) are used for carbon stock estimates, these sources must also include an estimate of the uncertainty and/or data ranges (data ranges can be used as proxies of confidence intervals);
- The project documentation shall include a table with carbon stock estimates in each pool and forest stratum (mean and 90% confidence interval) and an indication which sources of uncertainty were included;
- The uncertainty of calculation parameters (for example, carbon fraction, wood density, soil-organic carbon stock change factors, and root-to-shoot ratio) must be taken into account and propagated;
- The uncertainty associated with allometric equations and the uncertainty associated with imprecise measurement (e.g., imprecise tree height or diameter measurements) does not need to be accounted for.

As a measure of uncertainty, the standard deviation of the estimate[4] will be calculated. The following equations summarize simplified rules of error propagation when carrying out summations, subtractions, multiplications and divisions of two variables A and B. A multiplication with an exactly known coefficient *c* is also shown. The standard deviation of A is denoted as S(A). The uncertainty is understood to reflect the half-width of the two-sided 90% confidence interval. It is denoted as U(A) = t*S(A), where t is the t-value for a two-sided 90% confidence interval. The percentage uncertainty corresponds to the uncertainty, expressed as a percentage of the estimate, denoted as U%(A) = t * S(A) / A. Error propagation will be necessary to track uncertainty through the various calculation steps involved in estimating carbon stocks. The following basic equations shall be used:

Function	Standard deviation of estimate	Percentage uncertainty of estimate

[4] It is important to distinguish between the standard deviation of a population parameter from the standard deviation of the estimator of that population parameter. For example, where a population mean is estimated from sample measurements, the estimator will be the sample mean. The standard deviation of the mean estimate (often also referred to as standard error) will consider the number of sample units, n, and can be calculated from the population standard deviation by dividing by the squareroot of (n-1).

A+B	$S(A+B) = \text{sqrt}\{ S(A)^2 + S(B)^2 \}$	$U\%(A+B) = t * \text{sqrt}\{ S(A)^2 + S(B)^2 \} / (A+B)$
A*B	$S(A*B) = \lvert A*B \rvert * \text{sqrt}\{ (S(A)/A)^2 + (S(B)/B)^2 \}$	$U\%(A*B) = t * \lvert A*B \rvert * \text{sqrt}\{ (S(A)/A)^2 + (S(B)/B)^2 \} / (A*B)$
A-B	$S(A-B) = \text{sqrt}\{ S(A)^2 + S(B)^2 \}$	$U\%(A-B) = t * \text{sqrt}\{ S(A)^2 + S(B)^2 \} / (A-B)$
A/B	$S(A/B) = \lvert A/B \rvert * \text{sqrt}\{ (S(A)/A)^2 + (S(B)/B)^2 \}$	$U\%(A/B) = t * \lvert A/B \rvert * \text{sqrt}\{ (S(A)/A)^2 + (S(B)/B)^2 \} / (A/B)$
c*A	$S(c*A) = c*S(A)$	$U\%(c*A) = t * S(A) / A$

Estimation of Uncertainty for each pool, land cover transition and stratum

The uncertainty of each carbon pool for each land cover transition class and stratum shall first be propagated using the equation for subtraction from above:

$$U(\Delta C_{p,LCT,i}) = U(\Delta C_{p,LCT,i,bsl} - \Delta C_{p,LCT,i,post}) = \sqrt{U(C_{p,LCT,i,bsl})^2 + U(C_{p,LCT,i,post})^2} \quad (7)$$

$$U\%(\Delta C_{p,LCT,i}) = \frac{U(\Delta C_{p,LCT,i})}{\Delta C_{p,LCT,i}} \quad (8)$$

Where:

U()	Uncertainty as half-width of the two-sided 90% confidence interval; t CO_2-e ha^{-1}
U%()	Percentage uncertainty, i.e., uncertainty expressed as a percentage of the estimate; %
$\Delta C_{p,LCT,i}$	Emissions from carbon stock change in land cover transition *LCT* in stratum *i*, pool *p*; t CO_2-e ha^{-1}
$C_{p,LCT,i,bsl}$	Forest carbon stock estimate in land cover transition *LCT* in stratum *i*, pool *p*; t CO_2-e ha^{-1}
$C_{p,LCT,i,post}$	Post land use transition carbon stock estimate in land cover transition *LCT* in stratum *i*, pool *p*; t CO_2-e ha^{-1}
LCT	1, 2, 3, … LCT* land cover Transitions
i	1, 2, 3, … M strata

Step 4: Estimation of an Uncertainty Discount Factor

Conservative estimation of changes in carbon stocks is achieved by application of an uncertainty discount factor. To establish the uncertainty discount factor, first the average stock change is estimated by averaging over LCTs, forest strata and carbon pools.

For the leakage belt, uncertainty quantification is ignored (see the *VCS Standard* requirements on uncertainty).

Averaging over LCT, forest strata and carbon pools

The stock changes are averaged over the area of UD activity data within each LCT and forest stratum over the baseline period, for each pool separately, using an area-weighted average. The area data to be used for averaging represent the baseline area changes within the project area as derived from the overlay of the deforestation risk map and the forest type map. This calculation is carried out as follows:

$$W\Delta C_p = \frac{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i} * \Delta C_{p,LCT,i}}{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i}} \quad (9)$$

Where:

$W\Delta C_p$	UD activity data baseline weighted average emissions from carbon stock change in pool *p*; t CO_2-e ha^{-1}
$AD_{BSL,PA\text{-}AUD\ ,LCT,i}$	UD Activity data in the AUD Project area allocated to land cover transition *LCT* in forest stratum *i*; ha y^{-1}
LCT	1, 2, 3, … LCT* land cover Transitions
i	1, 2, 3, … *M* strata

The UD AD baseline weighted stock changes are then summed across the pools. For establishment of the discount factor, this shall be undertaken for all pools together, although soil-organic carbon and carbon stocks entering the wood products pool are kept separate when emission factors are applied to activity data.

For AUD-AUWD and AUD-RWE project activities, and thus all strata containing wetland soils, the non-wetland soil carbon pool ($\Delta C_{NonW\text{-}SOC,i}$) shall be set to zero and instead estimates of soil GHG emissions following wetland degradation ($GHG_{BSL\text{-}PEAT}$ or $GHG_{BSL\text{-}TW}$) shall employ the methods contained in the relevant methodology to this end.

$$W\Delta C = W\Delta C_{AB\_tree} + W\Delta C_{BB\_tree} + W\Delta C_{AB\_non\text{-}tree} + W\Delta C_{BB\_non\text{-}tree} + W\Delta C_{DW} + W\Delta C_{LI} + W\Delta C_{NonW\text{-}SOC} - WC_{WP} + WC_{WP100} \quad (10)$$

Where:

$W\Delta C$	UD activity data baseline Weighted emissions from carbon stock change; t CO_2e ha^{-1}
$W\Delta C_{AB\_tree}$	UD activity data baseline Weighted emissions from carbon stock change in aboveground tree biomass pool; t CO_2e ha^{-1}

$W\Delta C_{BB\_tree}$ UD activity data baseline Weighted emissions from carbon stock change in belowground tree biomass pool; t CO_2e ha^{-1}

$W\Delta C_{AB\_non\text{-}tree}$ UD activity data baseline Weighted emissions from carbon stock change in aboveground non-tree biomass pool; t CO_2e ha^{-1}

$W\Delta C_{BB\_non\text{-}tree}$ UD activity data baseline Weighted emissions from carbon stock change in belowground non-tree biomass pool; t CO_2e ha^{-1}

$W\Delta C_{DW}$ UD activity data baseline Weighted emissions from carbon stock change in dead wood pool; t CO_2e ha^{-1}

$W\Delta C_{LI}$ UD activity data baseline Weighted emissions from carbon stock change in litter pool; t CO_2e ha^{-1}

$W\Delta C_{NonW\text{-}SOC}$ UD activity data baseline Weighted emissions from carbon stock change in non-wetland soil organic carbon pool; t CO_2e ha^{-1}

WC_{WP} UD activity data baseline Weighted carbon stock entering the wood products pool; t CO_2e ha^{-1}

WC_{WP100} UD activity data baseline Weighted carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years; t CO_2e ha^{-1}

Uncertainty shall be propagated accordingly. In doing this, the area estimates for weighted averaging may be treated as simple multiplication factors without random uncertainty. These area estimates are not used as activity data here, but merely to represent the area distribution of forest strata.

$$U(W\Delta C_p) = U\left(\frac{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i} * \Delta C_{p,LCT,i}}{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i}}\right) \quad (11)$$

$$= \frac{\sqrt{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i}^{\ 2} * U(\Delta C_{p,LCT,i})^2}}{\sum_{LCT}^{LCT*}\sum_{i}^{M} A_{BSL,PA-UD,LCT,i}} \quad (12)$$

$$U\%\left(W\Delta C_p\right) = \frac{U(W\Delta C_p)}{W\Delta C_p} \quad (13)$$

Where:

U() Uncertainty as half-width of the two-sided 90% confidence interval; t CO_2-e ha^{-1}

U%() Percentage uncertainty, i.e., uncertainty expressed as a percentage of the estimate; %

$W\Delta C_p$	UD activity data baseline Weighted average emissions from carbon stock change in pool *p* over the baseline period; t CO_2-e ha^{-1}
$AD_{BSL,PA\text{-}UD\ ,LCT,i}$	UD Activity data in the AUD Project area allocated to land cover transition *LCT* in forest stratum *i*; ha y^{-1}
$\Delta C_{p,LCT,i}$	Emissions from carbon stock change in land cover transition *LCT* in stratum *i*, pool *p*; t CO_2-e ha^{-1}
LCT	1, 2, 3, … LCT* land cover Transitions
i	1, 2, 3, … *M* strata

Further, uncertainty shall be propagated using the equations for addition and subtraction from above.

$$U(W\Delta C) = \sqrt{\begin{matrix} U(W\Delta C_{AB\_tree})^2 + U(W\Delta C_{BB\_tree})^2 + U(W\Delta C_{AB\_non-tree})^2 \\ + U(W\Delta C_{BB_{non}-tree})^2 + U(W\Delta C_{DW})^2 + U(W\Delta C_{LI})^2 \\ + U(W\Delta C_{NonW-SOC})^2 + U(W\Delta C_{WP})^2 + U(W\Delta C_{WP100})^2 \end{matrix}} \quad (14)$$

$$U\%(W\Delta C) = \frac{U(W\Delta C)}{W\Delta C} \quad (15)$$

Where:

U()	Uncertainty as half-width of the two-sided 90% confidence interval; t CO_2-e ha^{-1}
U%()	Percentage uncertainty, i.e., uncertainty expressed as a percentage of the estimate; %
$W\Delta C$	UD activity data baseline Weighted emissions from carbon stock change; t CO_2e ha^{-1}
$W\Delta C_{AB\_tree}$	UD activity data baseline Weighted emissions from carbon stock change in aboveground tree biomass pool; t CO_2e ha^{-1}
$W\Delta C_{BB\_tree}$	UD activity data baseline Weighted emissions from carbon stock change in belowground tree biomass pool; t CO_2e ha^{-1}
$W\Delta C_{AB\_non\text{-}tree}$	UD activity data baseline Weighted emissions from carbon stock change in aboveground non-tree biomass pool; t CO_2e ha^{-1}
$W\Delta C_{BB\_non\text{-}tree}$	UD activity data baseline Weighted emissions from carbon stock change in belowground non-tree biomass pool; t CO_2e ha^{-1}

$W\Delta C_{DW}$	UD activity data baseline Weighted emissions from carbon stock change in dead wood pool; t CO_2e ha^{-1}
$W\Delta C_{LI}$	UD activity data baseline Weighted emissions from carbon stock change in litter pool; t CO_2e ha^{-1}
$W\Delta C_{NonW\text{-}SOC}$	UD activity data baseline Weighted emissions from carbon stock change in non-wetland soil organic carbon pool; t CO_2e ha^{-1}
WC_{WP}	UD activity data baseline Weighted carbon stock entering the wood products pool; t CO_2e ha^{-1}
WC_{WP100}	UD activity data baseline Weighted carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years; t CO_2e ha^{-1}

Estimation of an Uncertainty Discount Factor

The Discount Factor for emissions from carbon stock change is then calculated based on the resulting uncertainty of the baseline UD activity data Weighted carbon stock change..

- If the percentage uncertainty is less than or equal to 10%, the discount factor is 0%.
- If the percentage uncertainty is greater than 10%, the discount factor = percentage uncertainty / $t_{alpha=10\%}$ * $t_{alpha=66.66\%}$ ($t_{alpha=10\%}$ is the t-value for the two-sided 90% confidence interval, approximately 1.6449; $t_{alpha=66.6\%}$ is the t-value for a one-sided 66.66% confidence interval, approximately 0.4307).

With if $U\%(W\Delta C) < 10\%$ then: $DF_{W\Delta C} = 0\%$ (16)

if $U\%(W\Delta C) > 10\%$ then: $DF_{W\Delta C} = \frac{U\%(W\Delta C) * t_{alpha=66.67\%}}{t_{alpha=10\%}}$ (17)

Where:

$DF_{W\Delta C}$	Uncertainty discount factor for stock changes; percent
$U\%(W\Delta C)$	Percentage uncertainty in emissions from carbon stock change; percent

Step 5: Conservative Emissions from carbon stock change Estimation

For the AUD Project area, a conservative estimate of the emissions from carbon stock change is then calculated by summing the carbon stock pools and applying the Discount Factor. This shall be undertaken for above-ground biomass, below-ground biomass, litter

and deadwood; and soil-organic carbon and carbon stocks entering the wood products pool separately.

For AUD- AUWD and AUD-RWE project activities, and thus all strata containing wetland soils, the non-wetland soil carbon pool ($\Delta C_{NonW\text{-}SOC,i}$) shall be set to zero and instead estimates of soil GHG emissions following wetland degradation ($GHG_{BSL\text{-}PEAT}$ or $GHG_{BSL\text{-}TW}$) shall the methods contained in the relevant methodologies to this end.

For the leakage belt, uncertainty quantification is ignored, and thus no uncertainty deduction is required.

$$\Delta C_{C,AB\_BB\_DW\_LI\_WP,LCT,I} = (\Delta C_{AB\_tree,LCT,I} + \Delta C_{BB\_tree,LCT,I} + \Delta C_{AB\_non\text{-}tree,LCT,I} + \Delta C_{BB\_non\text{-}tree,LCT,I} + \Delta C_{DW,LCT,I} + \Delta C_{LI,LCT,I} - C_{WP,\,LCT,I}) * (1 - DF_{W\Delta C}) \quad (18)$$

$$\Delta C_{C,NonW\text{-}SOC\_WP100,LCT,i} = (\Delta C_{NonW\text{-}SOC,LCT,i} + C_{WP100,LCT,i}) * (1 - DF_{W\Delta C}) \quad (19)$$

$$\Delta C_{LB,AB\_BB\_DW\_LI\_WP,LCT,I} = \Delta C_{AB\_tree,LCT,I} + \Delta C_{BB\_tree,LCT,I} + \Delta C_{AB\_non\text{-}tree,LCT,I} + \Delta C_{BB\_non\text{-}tree,LCT,I} + \Delta C_{DW,LCT,I} + \Delta C_{LI,LCT,I} - C_{WP,\,LCT,I} \quad (20)$$

$$\Delta C_{LB,NonW\text{-}SOC\_WP100,LCT,i} = \Delta C_{NonW\text{-}SOC,LCT,i} + C_{WP100,LCT,i} \quad (21)$$

Where:

$\Delta Cc_{AB\_BB\_DW\_LI\_WP,i}$	Conservatively estimated emissions from carbon stock change to occur over a one-year period in the AUD Project area in aboveground; belowground; deadwood; and litter pools in stratum *i* ; t CO_2e ha^{-1}
$\Delta Cc_{NonW\text{-}SOC\_WP100,i}$	Conservatively estimated emissions from carbon stock change to occur over a 20-year period in the AUD Project area in the non-wetland soil organic carbon and wood products pools in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{LBAB\_BB\_DW\_LI\_WP,i}$	Estimated emissions from carbon stock change to occur over a one-year period in the AUD leakage belt in aboveground; belowground; deadwood; and litter pools in stratum *i* ; t CO_2e ha^{-1}
$\Delta C_{LBNonW\text{-}SOC\_WP100,i}$	Estimated emissions from carbon stock change to occur over a 20-year period in the AUD leakage belt in the non-wetland soil organic carbon and wood products pools in stratum *i*; t CO_2e ha^{-1}
$DF_{W\Delta C}$	Uncertainty discount factor for stock changes; percent
$\Delta C_{AB\_tree,LCT,i}$	Emissions from carbon stock change in aboveground tree biomass pool in land cover transition *LCT* in stratum *i*; t CO_2e ha^{-1}

$\Delta C_{BB\_tree,LCT,i}$	Emissions from carbon stock change in belowground tree biomass pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{AB\_non\text{-}tree,LCT,i}$	Emissions from carbon stock change in aboveground non-tree biomass pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{BB\_non\text{-}tree,LCT,i}$	Emissions from carbon stock change in belowground non-tree biomass pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{DW,LCT,i}$	Emissions from carbon stock change in dead wood pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{LI,LCT,i}$	Emissions from carbon stock change in litter pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$C_{WP,LCT,i}$	Carbon stock entering the wood products pool in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{NonW\text{-}SOC,LCT,i}$	Emissions from carbon stock change in non-wetland soil organic carbon pool in land cover transition *LCT* in stratum *i*; t CO_2e ha^{-1}
$C_{WP100,LCT,i}$	Carbon stock entering the wood products pool at the time of deforestation that is expected to be emitted over 100-years in land cover transition LCT in stratum *i*; t CO_2e ha^{-1}
i	1, 2, 3, … M strata
LCT	1,2,3, … LCT* land cover Transitions

5.6 Estimation of the annual baseline emissions from carbon stock changes

5.6.1 Terrestrial carbon stocks (non-wetland soils)

The sum of emissions from carbon stock changes that are projected to take place for the project baseline validity period for the AUD Project area are estimated by using the calculated area of activity data and the emissions from the carbon stock changes resulting from unplanned deforestation.

Stock changes in living biomass, deadwood and litter are assumed to be emitted at the time of the land use transition. Following the land use transition, emissions from non-wetland soil and wood products are assumed to take place gradually over time at an annual rate of 1/20 of the stock change. Thus, for a given year *t**, emissions are summed across areas of each land use transition class from the project start date up to time *t** (the year for which emissions are to be estimated) (for non-wetland soil organic carbon and wood products).

For carbon pools in AUD project activities within all non-wetland strata (excluding wetland soils):

$$\Delta C_{BSL_{PA-UD},LCT,i,t*} = (AD_{BSL,PA-UD,LCT,i,t*} * \Delta Cc_{AB\_BB\_DW\_LI\_WP,LCT,i}) + \frac{1}{20} * \sum_1^{t*}(AD_{BSL,PA-UD,LCT,i,t} * \Delta Cc_{NonW-SOC\_WP100,LCT,i}) \quad (22)$$

$$\Delta C_{BSL_{LB}-UD,LCT,i,t*} = (AD_{BSL,LB-UD,LCT,i,t*} * \Delta C_{LB,AB\_BB\_DW\_LI\_WP,LCT,i}) + \frac{1}{20} * \sum_1^{t*}(AD_{BSL,\mathrm{LB}-UD,LCT,i,t} * \Delta C_{LB,NonW-SOC\_WP100,LCT,i}) \quad (23)$$

Where:

$\Delta C_{BSL\_PA\text{-}UD\ ,LCT,i,t*}$	Sum of emissions from the baseline carbon stock change within AUD Project area in all carbon pools (excluding non-wetland soils) in land cover transition *LCT*, in stratum *i*, in year *t*;* t CO_2e
$\Delta C_{BSL\_LB\text{-}UD\ ,LCT,i,t*}$	Sum of emissions from the baseline carbon stock change within AUD leakage belt in all carbon pools (excluding non-wetland soils) in land cover transition *LCT*, in stratum *i*, in year *t*;* t CO_2e
$AD_{BSL,PA\text{-}UD\ ,LCT,i,t}$	Unplanned Deforestation activity data in the AUD Project area in land cover transition *LCT*, in stratum *i*, in year *t*; ha
$AD_{BSL,LB\text{-}UD\ ,LCT,i,t*}$	Unplanned Deforestation activity data in the AUD leakage belt in land cover transition *LCT*, in stratum *i*, in year *t**; ha
$\Delta Cc_{AB\_BB\_DW\_LI\_WP,i}$	Conservatively estimated emissions from carbon stock change to occur over a one-year period in aboveground; belowground; deadwood; and litter pools in stratum *i*; t CO_2e ha^{-1}
$\Delta Cc_{NonW\text{-}SOC\_WP100,i}$	Conservatively estimated emissions from carbon stock change to occur over a 20-year period in the non-wetland soil organic carbon and wood products pools in stratum *i*; t CO_2e ha^{-1}
$\Delta C_{LBAB\_BB\_DW\_LI\_WP,i}$	Estimated emissions from carbon stock change to occur over a one-year period in the AUD leakage belt in aboveground; belowground; deadwood; and litter pools in stratum *i* ; t CO_2e ha^{-1}
$\Delta C_{LBNonW\text{-}SOC\_WP100,i}$	Estimated emissions from carbon stock change to occur over a 20-year period in the AUD leakage belt in the non-wetland soil organic carbon and wood products pools in stratum *i*; t CO_2e ha^{-1}
LCT	1,2,3…LCT* land cover Transitions
i	1, 2, 3, … M strata
t	1, 2, 3, … *t** years elapsed since the start of the project activity

5.6.2 Estimation of baseline greenhouse gas emissions from wetlands SOC pool

For the wetlands SOC pool in AUD-AUWD and AUD-RWE project activities, use the relevant sections of the selected methodology to estimate soil GHG emissions following wetland degradation ($GHG_{BSL\text{-}PEAT}$ or $GHG_{BSL\text{-}TW}$) within the AUD Project area and AUD leakage belt.

When using methodologies, $A_{BSL,i,t}$ (Area of stratum *i* in year *t* in the AUD project area and AUD leakage belt in the baseline scenario) must be quantified. For example, in the case of VM0007, modules *BL-PEAT* or *BL-TW,* $A_{BSL,i,t}$ and $A_{BSL,LKA,i,t}$ are equal to $AD_{BSL,PA\text{-}AUD\ ,LCTi,t}$ and $A_{BSL,LKA\text{-}UD\ ,LCTi,t}$, respectively. $A_{BSL,i,t}$ and $A_{BSL,LKA,}$ areas are subject to stratification[5]. The sum of strata must be equal to $AD_{BSL,PA\text{-}AUD\ ,LCTi,t}$ and $A_{BSL,LKA\text{-}UD\ ,LCTi,t}$, respectively.

For all project activities taking place on non-wetland strata, these equations shall be set to zero.

On forested peatland:

$GHG_{BSL\_PA\text{-}UD,PEAT,t} = GHG_{BSL\text{-}PEAT,t}$ for the AUD Project area (24)

$GHG_{BSL\_LB\text{-}UD,PEAT,t} = GHG_{BSL\text{-}PEAT,t}$ for the AUD leakage belt (25)

On tidal forested wetland:

$GHG_{BSL\_PA\text{-}UD,TW,t} = GHG_{BSL\text{-}TW,t}$ for the AUD Project area (26)

$GHG_{BSL\_LB\text{-}UD,TW,t} = GHG_{BSL\text{-}TW,t}$ for the AUD leakage belt (27)

Where:

$GHG_{BSL\_PA\text{-}UD,PEAT,t}$	Net GHG emissions in the baseline scenario from unplanned peatland degradation in the AUD Project area in year *t*; t CO_2e
$GHG_{BSL\_LB\text{-}UD,PEAT,t}$	Net GHG emissions in the baseline scenario from unplanned peatland degradation in the AUD leakage belt in year t; t CO_2e
$GHG_{BSL\_PA\text{-}UD,TW,t}$	Net GHG emissions in the baseline scenario from unplanned tidal wetland degradation in the AUD Project area in year t; t CO_2e
$GHG_{BSL\_LB\text{-}UD,TW,t}$	Net GHG emissions in the baseline scenario from unplanned tidal wetland degradation in the AUD leakage belt in year t; t CO_2e
$GHG_{BSL\text{-}PEAT,t}$	Net GHG emissions in the WRC baseline scenario on peatland in year t; t CO_2e (from module *BL-PEAT*)

[5] Module *BL-PEAT*, for example, distinguishes area of ditch and other open water, area of peat burnt and area of peatland (not open water, not burnt).

$GHG_{BSL\text{-}TW,t}$	Net GHG emissions in the WRC baseline scenario on tidal wetland in year t; t CO_2e (from module *BL-TW*)

5.7 Estimation of the sum of other greenhouse gas emissions

In addition, any other GHG emissions that would take place in the baseline Scenario within the Unplanned Deforestation Project area shall be estimated.

The other GHG emissions within the AUD project area can be estimated as:

$$GHG_{BSL\_PA-UD,E} = \sum_{t=1}^{t^*} \sum_{LCT}^{LCT*} \sum_{i=1}^{M} \left(E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t}\right) \quad (28)$$

Where:

$GHG_{BSL\_PA\text{-}UD,E}$	Other greenhouse gas emissions as a result of unplanned deforestation activities within the AUD Project area in the baseline up to year *t**; t CO_2e
$E_{FC,i,t}$ t CO_2e	Net CO_2e emission from fossil fuel combustion in stratum *i* in year *t*;
$E_{BiomassBurn,i,t}$	Non-CO_2 emissions due to biomass burning as part of unplanned deforestation activities in stratum *i* in year *t*; t CO_2e
$N_2O_{direct\text{-}N,i,t}$	Direct N_2O emission as a result of nitrogen application on the alternative land use in stratum *i* in year *t*; t CO_2e
LCT	1,2,3…LCT* land cover Transitions
i	1, 2, 3, … *M* strata
t	1, 2, 3, …t^* years elapsed since the projected start of the AUD project baseline validity period

For detailed information regarding the calculation of $E_{FC,i,t}$, $E_{BiomassBurn,i,t}$ and $N_2O_{direct\text{-}N,i,t}$ see the relevant methodology. Other GHG emission sources excluded from the project boundary can be neglected, i.e., accounted as zero. For the determination which sources of emissions must be included in the calculations see the relevant methodology.

5.8 Calculation of net emissions under baseline for the project baseline validity period

The net emissions under baseline conditions are then calculated as:

$$\Delta C_{BLS,\mathrm{PA-UD}} = \left(\sum_{t=1}^{t*} \sum_{LCT=1}^{LCT^*} \sum_{i=1}^{M} \Delta C_{BSL,PA-UD,LCT,i,t}\right) + GHG_{BSL_{PA}-UD,PEAT} + GHG_{BSL\_PA-UD,TW} + GHG_{BSL\_PA-UD,E} \quad (29)$$

$$\Delta C_{BSL,\mathrm{LB-UD}} = (\sum_{t=1}^{t*} \sum_{LCT=1}^{LCT^*} \sum_{i=1}^{M} \Delta C_{BSL,\mathrm{LB-UD},LCT,i,t}) + GHG_{BSL\_LB-UD,PEAT,t} + GHG_{BSL\_LB-UD,TW,t} \quad (30)$$

Where:

ΔC_{BSL_PA-UD}	Net greenhouse gas emissions in the baseline within the AUD Project area up to year *t**; t CO_2e
ΔC_{BSL_LB-UD}	Net greenhouse gas emissions in the baseline within the AUD leakage belt, up to year *t**; t CO_2e
$GHG_{BSL\_PA-UD,E}$	Other greenhouse gas emissions as a result of deforestation activities within the AUD Project area in the baseline up to year *t**; t CO_2e
$\Delta C_{BSL\_PA-UD,LCTi,t}$	Sum of the baseline emissions from carbon stock change within AUD Project area in all carbon pools (excluding wetland soils) in land cover transition *LCT*, in stratum *i*, in year *t;* t CO_2e
$\Delta C_{BSL\_LB-UD,LCTi,t}$	Sum of the baseline emissions from carbon stock change within AUD leakage belt in all carbon pools (excluding wetland soils) in land cover transition *LCT*, in stratum *i*, in year *t;* t CO_2e
$GHG_{BSL\_PA-UD,PEAT,t}$	Net GHG emissions in the baseline scenario from unplanned peatland degradation in the AUD Project area in year *t*; t CO_2e
$GHG_{BSL\_LB-UD,PEAT,t}$	Net GHG emissions in the baseline scenario from unplanned peatland degradation in the AUD leakage belt in year t; t CO_2e
$GHG_{BSL\_PA-UD,TW,t}$	Net GHG emissions in the baseline scenario from unplanned tidal wetland degradation in the AUD Project area in year t; t CO_2e
$GHG_{BSL\_LB-UD,TW,t}$	Net GHG emissions in the baseline scenario from unplanned tidal wetland degradation in the AUD leakage belt in year t; t CO_2e
$GHG_{BSL\_PA-UD,E}$	Other greenhouse gas emissions as a result of deforestation activities within the AUD Project area in the baseline up to year *t**; t CO_2e
i	1, 2, 3, … *M* strata
LCT	1,2,3…LCT* land cover Transitions
t	1, 2, 3, … *t** years elapsed since the projected start of the AUD project activity

6 DATA AND PARAMETERS

6.1 Data and Parameters Available at Validation

Data / Parameter	Digital Map of Jurisdictional Boundaries
Data unit	Digital Map
Description	Digital raster or vector map depicting all areas included in the jurisdiction.
Equations:	n/a
Source of data	Verra, defined from application of J-ADB-UD module
Value applied	n/a
Justification of choice of data or description of measurement methods and procedures applied	n/a
Purpose of Data	Defines the historical reference area and carbon accounting area for all activities.
Comments	

Data / Parameter	Digital Maps of AUD Project area Boundaries
Data unit	Digital Map
Description	Digital raster or vector map depicting locations of all AUD Project areas within the Jurisdiction
Equations:	n/a
Source of data	Project Developer
Value applied	n/a
Justification of choice of data or description of measurement methods and procedures applied	Projected coordinate system must match that of *Digital Map of Jurisdictional Boundaries*

Purpose of Data	Used with the Jurisdictional Risk Map and the JNR Allocation Tool to allocate baseline activity data to each AUD Project area within the coming crediting year.
Comments	

Data / Parameter	Digital Maps of AUD leakage belt
Data unit	Digital Map
Description	Digital raster or vector map depicting locations of all AUD project leakage belts within the Jurisdiction
Equations:	n/a
Source of data	Project Developer
Value applied	n/a
Justification of choice of data or description of measurement methods and procedures applied	Projected coordinate system must match that of *Digital Map of Jurisdictional Boundaries*
Purpose of Data	
Comments	Used with the Jurisdictional Risk Map and the JNR Allocation Tool to allocate baseline activity data to each AUD Project area within the coming crediting year.

Data / Parameter	$A_{PA\text{-}UD}$
Data unit	Ha
Description	Area of project where Avoided unplanned deforestation activities will take place
Equation:	Used in the development of the AUD project risk map
Source of data	Calculated within a GIS
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	

Purpose of Data	Calculation of project emissions
Comments	

Data / Parameter	$A_{LB\text{-}UD}$
Data unit	Ha
Description	Area of the leakage belt where unplanned deforestation in the project area may be displaced due to project activities
Equation:	Used in the development of the AUD leakage belt risk map
Source of data	Calculated within a GIS
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions in the leakage belt
Comments	

Data / Parameter	JBVP
Data unit	Years
Description	Length of the jurisdictional baseline validity period
Equations:	1,2,3,4
Source of data	J-ADB-UD module
Value applied	

Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	
Comments	

6.2 Data and Parameters Monitored

Data / Parameter:	Project-specific Forest Cover Benchmark Map (FCBMp)
Data unit:	Digital Map
Description:	Digital Maps of Forest / Non-Forest Map covering the entire AUD project area and leakage belt, and representing time periods spanning the Historical Reference Period that meet the requirements of the latest JNR Risk Mapping Tool.
Equations:	
Source of data:	Project Developer
Description of measurement methods and procedures to be applied:	As delineated in JNR Risk Mapping Tool
Frequency of monitoring/recording:	Prior to start of next JBVP
QA/QC procedures to be applied:	
Purpose of data:	Used to supplement the Jurisdictional FCBM for locations within the AUD-PA and AUD-LB
Calculation method:	
Comments:	Optional for most projects. Only required if If the baseline validity period start date is beyond of one year from the start of the JBVP. Projected coordinate system must match that of *Digital Map of Jurisdictional Boundaries*

Data / Parameter:	Forest Cover Benchmark Map (FCBM)
Data unit:	Digital Map
Description:	Digital Maps of Forest / NonForest Map covering the entire jurisdiction and a buffer zones and representing time periods spanning the Historical Reference Period that meet the requirements of the latest JNR Risk Mapping Tool.
Equations:	
Source of data:	J-ADB-UD module
Description of measurement methods and procedures to be applied:	As delineated in JNR Risk Mapping Tool
Frequency of monitoring/recording:	Prior to start of next JBVP
QA/QC procedures to be applied:	
Purpose of data:	Used to identify areas considered “Forest” at the start of the JBVP
Calculation method:	
Comments:	Shall be provided to project developer by J-ADB-UD data developer at the beginning of the JBVP

Data / Parameter:	Project Forest Stratification Map
Data unit:	Digital Map
Description:	Digital map of forest strata used in baseline emissions estimates.
Equations:	
Source of data:	Project Developer
Description of measurement methods and procedures to be applied:	Project forest stratification map shall Be identical to, or directly derived from the spatial stratification utilized in development of project carbon stocks through forest inventory. (E.g., a map with a higher number of classes used for forest inventory may be simplified by combining classes after analysis of inventory is complete) Encompass the AUD-PA and AUD-LB and use the same set of forest strata definitions between both areas. Be utilized by MON-ADD to associate sample plot observations of activity data Categories (AD-C) with forest strata. Assign a forest stratum for all areas mapped as Forest in the latest FCBM.
Frequency of monitoring/recording:	Prior to first verification within an JBVP, and in the event of a natural disturbance that requires development of a new forest stratum.
QA/QC procedures to be applied:	No assessment of spatial accuracy is required for the project forest stratification map
Purpose of data:	In BL-UD used to Calculate the area of forest strata located within each jurisdictional risk class ($A_{PA\text{-}UD,r,i}$) Stratify the sampling design of forest carbon inventory
Calculation method:	In GIS
Comments:	Optional for most projects. Only required if the baseline validity period start date is beyond of one year from the start of the JBVP. Projected coordinate system must match that of *Digital Map of Jurisdictional Boundaries*

Data / Parameter:	$A_{PA\text{-}UD,r,i}$

Data unit:	Ha
Description:	Area of forest in the AUD Project area at the start of JBVP in Risk Class *r* in forest stratum *i*
Equations:	3, 4
Source of data:	Spatially-explicit map of forest strata developed by project Developer and spatial subset of the Jurisdictional Risk Map associated with this JBVP
Description of measurement methods and procedures to be applied:	Calculated in GIS
Frequency of monitoring/recording:	Prior to first verification within an JBVP
QA/QC procedures to be applied:	n/a
Purpose of data:	Used to assign the project's allocation of per-risk-class AD to forest strata within the AUD Project area
Calculation method:	Spatial overlay of the FCBM, the Jurisdictional Risk Map, and a project-developed forest stratification map
Comments:	

Data / Parameter:	$A_{LB\text{-}UD,r,i}$
Data unit:	Ha
Description:	Area of forest in the AUD leakage belt at the start of JBVP in Risk Class *r* in forest stratum *i*
Equations	4
Source of data:	Spatially-explicit map of forest strata developed by project Developer and spatial subset of the Jurisdictional Risk Map associated with this JBVP
Description of measurement methods and procedures to be applied:	In GIS

Frequency of monitoring/recording:	Prior to first verification within an JBVP
QA/QC procedures to be applied:	n/a
Purpose of data:	Used to calculate UD activity data in the AUD project area allocated to land cover transition *LCT* in forest stratum *i* in a given year
Calculation method:	Spatial overlay of the FCBM, the jurisdictional risk map, and a project-developed forest stratification map
Comments:	

Data / Parameter:	$AD_{PA,LCT,r}$
Data unit:	ha y^{-1}
Description:	Projected annual activity data allocated to AUD project area *pa* for land cover transition *LCT* in Risk Class *r* in the JBVP, ha y^{-1}
Equation:	3
Source of data:	VCS, J-ADB-UD, equation 29
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Prior to start of next JBVP
QA/QC procedures to be applied:	
Purpose of data:	Used to calculate UD activity data in the AUD project area allocated to land cover transition *LCT* in forest stratum *i* in a given year
Calculation method:	Application of J-ADB-UD by the VCS
Comments:	

Data / Parameter:	$AD_{LB,LCT,r}$

Data unit:	ha y^{-1}
Description:	Projected annual activity data allocated to AUD leakage belt *LB* for land cover transition *LCT* in risk class *r* in the JBVP; ha y^{-1}
Equation:	4
Source of data:	VCS, J-ADB-UD, equation 30
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Prior to start of next JBVP
QA/QC procedures to be applied:	
Purpose of data:	Used to calculate UD activity data in the AUD leakage belt allocated to land cover transition *LCT* in forest stratum *i* in a given year
Calculation method:	Application of J-ADB-UD by Verra
Comments:	

Data / Parameter:	$C_{AB\_tree,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in aboveground tree biomass in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See Relevant VCS methodology
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period

QA/QC procedures to be applied:	See Relevant VCS methodology
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{AB\_tree,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-land use transition carbon stock in aboveground tree biomass in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See Relevant VCS methodology
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{BB\_tree,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in belowground tree biomass in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{BB\_tree,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-land use transition carbon stock in belowground tree biomass in land cover transition LCT, stratum i
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.

Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{AB\_non\text{-}tree,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in aboveground non-tree vegetation in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition

Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{AB\_non\text{-}tree,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-land use transition carbon stock in aboveground non-tree vegetation in land cover transition LCT, stratum i
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{BB\_nontree,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}

Description:	Forest carbon stock in belowground non-tree biomass in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{BB\_nontree,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-land use transition carbon stock in belowground non-tree biomass in land cover transition LCT, stratum i
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module

Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{DW,bsl,,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in dead wood in stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{DW,post,LCT,i}$

Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in dead wood in land cover transition LCT, stratum i
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{LI,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in litter in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module

Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{LI,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in litter in land cover transition LCT, stratum i
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module

Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{SOC,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in soil organic carbon in land cover transition LCT, stratum i
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{SOC,PD-BSL,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in (non-wetland) soil organic carbon in land cover transition *LCT*, stratum *i*

Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{BB\_nontree,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-land use transition carbon stock in belowground non-tree biomass in land cover transition *LCT*, stratum *i*
Equation:	5

Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{DW,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in dead wood in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module

Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{DW,post,,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in dead wood in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of

	stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{LI,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in litter in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{LI,post,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in litter in land cover transition *LCT*, stratum *i*
Equation:	5

Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$C_{SOC,bsl,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Forest carbon stock in soil organic carbon in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Field measurements as delineated in relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module

Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of carbon stock; used to calculate change in carbon pool following land cover transition
Calculation method:	See relevant VCS methodology or module
Comments:	

Data / Parameter:	$C_{SOC,PD\text{-}BSL,LCT,i}$
Data unit:	t CO_2e ha^{-1}
Description:	Post-deforestation carbon stock in (non-wetland) soil organic carbon in land cover transition *LCT*, stratum *i*
Equation:	5
Source of data:	Sourced from published and/or peer-reviewed studies selected with priority from higher to lower preference, as available, as follows: within 5 km of the AUD project boundary, jurisdiction (subnational or national, in that order), national data from neighboring countries with similar conditions, global. Where this data is inadequate or not appropriate, it is allowable for field sampling to take place within the jurisdiction. Field sampling design must result in an estimate that produces conservative estimates of the carbon stocks.
Description of measurement methods and procedures to be applied:	Section 5.4 Step 1 of module
Frequency of monitoring/recording:	Stock estimates must be updated for each baseline validity period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Estimate of long-term area-weighted average stocks of non-forest land use; used to calculate change in carbon pool following land cover transition
Calculation method:	Stock estimates of each non forest land use class represented must be equal to the long-term average stocks (time-weighted average of

	stocks in cyclical post-deforestation land-use systems such as shifting agriculture with fallow)
Comments:	

Data / Parameter:	$E_{FC,i,t}$
Data unit:	t CO_2e
Description:	Net CO_2e emission from fossil fuel combustion in stratum i in year t
Equation:	22
Source of data:	Relevant VCS methodology or module
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Every project baseline period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Calculation of emissions taking place within the AUD project area in the absence of the project
Calculation method:	See relevant VCS methodology
Comments:	

Data / Parameter:	$E_{BiomassBurn,i,t}$
Data unit:	t CO_2e
Description:	Non-CO_2 emissions due to biomass burning as part of unplanned deforestation activities in stratum *i* in year t
Equation:	22
Source of data:	Relevant VCS methodology or module

Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Every project baseline period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Calculation of other GHG emissions taking place within the AUD Project area in the absence of the project
Calculation method:	See relevant VCS methodology
Comments:	

Data / Parameter:	$GHG_{BSL\text{-}PEAT}$
Data unit:	t CO_2e
Description:	Net GHG emissions in the WRC project scenario on peatland up to year *t**
Equation:	25
Source of data:	Relevant VCS methodology or module BL-PEAT
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Every project baseline period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Calculation of GHG emissions taking place on peatlands within the AUD Project area in the absence of the project
Calculation method:	See relevant VCS methodology
Comments:	

Data / Parameter:	$GHG_{BSL\text{-}TW}$
Data unit:	t CO_2e
Description:	Net GHG emissions in the baseline scenario from unplanned tidal wetland degradation up to year *t**
Equation:	26
Source of data:	Relevant VCS methodology or module BL-TW
Description of measurement methods and procedures to be applied:	See relevant VCS methodology or module
Frequency of monitoring/recording:	Every project baseline period
QA/QC procedures to be applied:	See relevant VCS methodology or module
Purpose of data:	Calculation of GHG emissions taking place on tidal wetlands within the AUD project area in the absence of the project
Calculation method:	See relevant VCS methodology
Comments:	