

## CORRECTIONS AND CLARIFICATIONS TO VM0042 IMPROVED AGRICULTURAL LAND MANAGEMENT, v2.2

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This document provides corrections and clarifications applicable to VCS methodology *VM0042 Improved Agricultural Land Management, v2.2*. Such corrections and clarifications are effective on their issuance date. Project proponents and validation/verification bodies (VVBs) shall apply and interpret *VM0042, v2.2* consistent with the corrections and clarifications set out in this document.

These updates will be incorporated into the next issued version of the methodology.

Correction/Clarification	Description	Section Reference
<a href="#">Clarification 1</a>	The baseline scenario justification in Appendix 3 has been confirmed to apply for improved ALM in general and project proponents need not replicate the analysis for their projects	Section 6 Baseline Scenario
<a href="#">Clarification 2</a>	The qualitative specifications of crop planting and harvesting practices in Table 4 have been clarified.	Section 6 Baseline Scenario
<a href="#">Clarification 3</a>	Requirements for describing the baseline scenario in grouped projects have been clarified.	Section 6 Baseline Scenario
<a href="#">Clarification 4</a>	Acceptable transparent and verifiable evidence for Step 2 Barrier Analysis under <i>VT0008</i> has been specified.	Section 7 Additionality
<a href="#">Clarification 5</a>	Application of Step 4c of <i>VT0008</i> to demonstrate that a proposed project activity is not common practice has been clarified.	Section 7 Additionality
<a href="#">Clarification 6</a>	The interplay between quantification units and eligibility areas under <i>VCS Standard, v5.0</i> has been clarified.	Section 8.1 Summary

<a href="#">Clarification 7</a>	A change in analytical laboratory is allowed when transitioning to an eligible analytical method to determine SOC content per Appendix 4.	Section 8.2.1.4 Measurements of SOC Content
<a href="#">Correction 1</a>	The unit for parameter $VS_{i,j,t,P}$ has been corrected.	Section 8.2.7 Methane Emissions from Manure Deposition
<a href="#">Clarification 8</a>	The five-year remeasurement requirement under Quantification Approach 2 has been clarified.	Section 8.3 Project Emissions
<a href="#">Correction 2</a>	The parameter description in Equation (36) for parameter $LK_{disp,t}$ has been corrected.	Section 8.4.3 Accounting for Leakage from Production Declines
<a href="#">Correction 3</a>	The missing parameter for leakage from production declines as displaced production ( $LK_{disp,t}$ ) has been added to equations summing leakage emissions allocated to reductions (Equation (39)) and removals (Equation (42)).	Section 8.5 Net Reductions and Removals
<a href="#">Clarification 9</a>	The interplay between timing requirements for adding project activity instances over time, remeasurement intervals, options for back-modeling, and updates to the model validation report has been clarified.	Section 8.6.1.3 Remeasurement, Model True-Up and Cumulative Modeling

## 1 CLARIFICATION 1

### Clarification:

The first paragraph of Section 6 must be read as follows:

### 6 BASELINE SCENARIO

Considering current market trends, existing government policies and legal requirements, socioeconomic conditions, and technological developments in the agriculture sector, the continuation of pre-project ALM practices is determined to be the most plausible baseline scenario for all projects implementing improved ALM following VM0042, (see as further justification justified in Appendix 3). The justification in Appendix 3 is generally applicable to all projects; project proponents are not required to use the framework of Appendix 3 to justify that the continuation of pre-project ALM practices is the baseline scenario for their project.

**Background:**

Appendix 3 provides a justification at the methodology level for the continuation of pre-project ALM practices as the most plausible baseline scenario for improved ALM under VM0042. The methodology does not require project proponents to replicate this analysis for each individual project or set of proposed project activities.

## 2 CLARIFICATION 2

**Clarification:**

Table 4 must be read as follows:

### 6 BASELINE SCENARIO

[...]

**Table 4: Minimum specifications for ALM practices in the baseline scenario**

ALM Practice	Qualitative	Quantitative
<b>Crop Planting and Harvesting</b>	<ul style="list-style-type: none"> <li>• Crop type(s) (e.g., crop functional group(s))</li> <li>• Crop rotation (Y/N)</li> <li>• Cover crops (Y/N)</li> <li>• Intercropping (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>• Approximate date(s) planted (where applicable)</li> <li>• Approximate date(s) harvested/terminated (where applicable)</li> <li>• Crop yield (where applicable)</li> </ul>
<b>Nitrogen Fertilizer Application</b>	<ul style="list-style-type: none"> <li>• Manure (Y/N)</li> <li>• Compost (Y/N)</li> <li>• Synthetic N fertilizer (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>• Manure type application rate (where applicable)</li> <li>• Compost type application rate (where applicable)</li> <li>• N application rate in synthetic fertilizer (where applicable)</li> </ul>
<b>Tillage and/or Residue Management</b>	<ul style="list-style-type: none"> <li>• Tillage (Y/N)</li> <li>• Crop residue removal (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>• Depth of tillage (where applicable)</li> <li>• Frequency of tillage (where applicable)</li> <li>• Percent of soil area disturbed (where applicable)</li> <li>• Percent of crop residue removed (where applicable)</li> </ul>
<b>Water Management/Irrigation</b>	<ul style="list-style-type: none"> <li>• Irrigation (Y/N)</li> <li>• Flooding (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation rate (where applicable)</li> </ul>
<b>Grazing Practices</b>	<ul style="list-style-type: none"> <li>• Grazing (Y/N)</li> <li>• Animal type (where applicable)</li> <li>• Harvesting/mowing (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>• Animal stocking rate (i.e., number of animals and length of time grazing in each area annually, where applicable)</li> <li>• Frequency of harvest</li> </ul>

ALM Practice	Qualitative	Quantitative
Liming	<ul style="list-style-type: none"> <li>Application of calcitic limestone or dolomite (Y/N)</li> </ul>	<ul style="list-style-type: none"> <li>Calcitic limestone or dolomite application rate (where applicable)</li> </ul>

**Background:**

Qualitative specifications of crop planting and harvesting practices featured in Table 4 for describing baseline scenario ALM practices have been further explained.

### 3 CLARIFICATION 3

**Clarification:**

Section 6 must be read as:

#### 6 BASELINE SCENARIO

[...]

For each quantification unit (e.g., for each field), baseline scenario practices are set to match the practices implemented in the historical look-back period, creating an annual schedule of activities to be repeated throughout the first baseline period.<sup>8</sup> Baseline emissions/stock changes are then modeled (Quantification Approach 1) or (for SOC stock change only) directly measured in baseline control sites subject to the annual schedule of activities (Quantification Approach 2). Note that under Quantification Approach 1, direct SOC stock estimates are also required at time  $t = 0$  years to serve as model input for model initialization.<sup>9</sup> The crops and practices assumed in the baseline scenario must be reassessed every ten years in accordance with the requirements of the most recent version of the *VCS Standard* and revised, where necessary, to reflect current agricultural production in the region.<sup>10</sup> However, where regional production practices change and/or data becomes available across shorter timeframes, it is recommended to reassess the baseline every five years.

Project proponents must describe the baseline scenario for the project area by specifying whether the land is either cropland or grassland at the project start date and providing a comprehensive

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<sup>8</sup> For example, where the schedule of activities includes tillage events in years  $t = -3$  and  $-1$  but does not involve tillage in year  $t = -2$ , the schedule of activities for tillage in the baseline scenario would be tillage, no tillage, tillage. This pattern would be repeated as follows for the first baseline period: tillage, no tillage, tillage, tillage, no tillage, tillage, tillage, no tillage, tillage, tillage.

<sup>9</sup> Per Table 6, baseline SOC stocks may be (back-)modeled to  $t = 0$  from measurements collected within  $\pm 5$  years of  $t = 0$ .

<sup>10</sup> See Section 3.2.7 of the *VCS Standard, v4.7*.

qualitative description of pre-project ALM practices, covering the categories listed in Table 4. The range of variations observed in all initial project activity instances within the project area must be described.

Project proponents must also identify the specific baseline practices that will be impacted by implementation of the proposed project activity or activities.

For grouped projects, the baseline scenario must be described for each eligibility area.<sup>11a</sup> All observed qualitative variations in the specifications of each ALM practice within each eligibility area must be described. Different land classifications as cropland or grassland must be treated as separate eligibility areas as these reflect distinct baseline conditions.

At future verifications, additional project activity instances may be enrolled. Such instances may exhibit different pre-project ALM practices, provided that at least one of the pre-project ALM practices impacted by project activities in the new instance matches the validated baseline scenario.

Box 2 provides an example of how to describe the baseline scenario of a grouped project in the project description, and how to determine eligibility of new project activity instances joining the eligibility area after validation, based on a hypothetical project.

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<sup>11a</sup> Or geographic area per VCS Standard, v4.7 and previous versions

### Box 2: Example of baseline scenario description and eligibility of new project activity instances for a grouped project

A hypothetical grouped project is implemented on cropland among smallholder farmers in the Ethiopian highlands. The proposed project activities are:

- 1) introduction of legume intercropping (e.g., maize intercropped with common bean or pigeon pea),
- 2) implementation of no-tillage to improve soil organic carbon and productivity, and
- 3) implementation of integrated soil fertility management (ISFM) encompassing judicious use of mineral and synthetic fertilizers, and liming every four years.

The baseline scenario is described in the project description as shown in Table B2, covering the specifications listed in Table 4.

**Table B2. Baseline scenario description for eligibility area 1 (EA1) – cropland, to be included in project description**

Pre-project ALM practice	Qualitative description	Project activity impact
Crop planting and harvesting	Annual food crops (e.g., maize, sorghum, millet). Cereal–cereal or cereal–legume rotation. Minimal soil cover following harvest; no systematic cover cropping.	Yes. Project activity introduces intercropping leguminous cover crops (project activity 1).
Nitrogen fertilizer application	Very low or no mineral and synthetic fertilizer; occasional use of farmyard manure	Yes. Project activity introduces ISFM (project activity 3).
Tillage and residue management	Manual or animal drawn conventional tillage or reduced tillage (e.g., disk tillage) prior to planting. Crop residues partially retained or removed for use as cooking fuel.	Yes. Project activity implements no-tillage (project activity 2).
Water management / irrigation	None (rainfed systems)	No
Grazing practices	Post-harvest free grazing of household livestock (cattle, sheep, goats)	No
Liming	None	Yes. Project activity applies lime every four years (project activity 3).

New project activity instances may be added to EA1 in this hypothetical project when at least one pre-project ALM practice impacted by project activities aligns with the validated baseline scenario, and the land is cropland.

The following project activity instances would be eligible for inclusion in EA1 despite differences to the validated baseline scenario practices (marked in **bold**):

- a) Annual food crops (e.g., maize, sorghum, millet). Cereal–cereal or cereal–legume rotation. Minimal soil cover following harvest; no systematic cover cropping. No mineral and synthetic fertilizer; occasional use of farmyard manure. **Strip tillage**. Crop residues removed. Rainfed. Post-harvest free grazing. No liming.  
*Eligible for inclusion in EA1 as all project activities are planned for implementation.*
- b) Annual food crops (e.g., maize, sorghum, millet). Cereal–cereal or cereal–legume rotation. Minimal soil cover following harvest; no systematic cover cropping. Low NPK application rates; occasional use of farmyard manure. Animal-drawn conventional tillage. Crop residues removed. **Traditional furrow irrigation**. Post-harvest free grazing. No liming.  
*Eligible for inclusion in EA1 as all project activities are planned for implementation.*
- c) Annual food crops (e.g., maize, sorghum, millet). Cereal–cereal or cereal–legume rotation. Minimal soil cover following harvest; no systematic cover cropping. No mineral and synthetic fertilizer; occasional use of farmyard manure. **Strip tillage**. Crop residues removed. Rainfed. Post-harvest free grazing. **Liming every six years**.  
*Eligible for inclusion in EA1 as project activities 1 (legume intercropping) and 2 (no-tillage) are planned for implementation.*

The following project activity instances would not be eligible for inclusion in EA1, because of differences to the validated baseline scenario practices (marked in **bold**):

- d) Rotation of **maize intercropped with common bean**, barley, and vetch for controlled grazing. **ISFM. No tillage**. Crop residues retained. Rainfed. **Liming every 3–5 years**.  
*Not eligible for inclusion in EA1 as all project activities are already part of pre-project practices.*
- e) Communal **grazing land**. No mineral and synthetic fertilizer. No tillage. Rainfed. Post-harvest free grazing. Continuous grazing dominated by cattle with limited mowing. No liming.  
*Not eligible for inclusion in EA1 as the land is grassland at the project start date.*

### **Development of Schedule of Activities ~~in the Baseline Scenario~~**

For each quantification unit, a schedule of activities ~~in the baseline scenario~~ is determined by assessment of practices implemented during the period prior to the project start date. This forms the basis for calculating baseline emissions following the guidance in Section 8. The interval over which practices are assessed, x years, must be a minimum of three years and must include at least one complete crop rotation, where applicable.

#### **Background:**

To streamline project reviews and VVB audits, the additional text aims to clarify expectations related to the content of the baseline scenario description that must be provided in project documents. The text also clarifies how the baseline scenario description determines the eligibility of new project activity instances.

## 4 CLARIFICATION 4

#### **Clarification:**

Section 7 must be read as:

### 7 ADDITIONALITY

[...]

#### **Step 2: Barrier analysis**

Project proponents must apply the procedures and requirements in Step 2 of the most recent version of *VT0008 Additionality Assessment*.

For the purposes of this methodology, Step 2 of *VT0008* must only be applied with respect to the project activity. Sub-steps that require assessment of the alternative scenarios described in Appendix 3 in this methodology need not be applied.

When applying Requirement 1 in Appendix 1 of *VT0008*, project proponents must provide publicly available, transparent, and verifiable evidence relevant to the project area and the proposed project activities, such as:

- 1) agricultural census or other government (e.g., survey) data;
- 2) peer-reviewed scientific literature;
- 3) independent reports, assessments, or datasets issued by recognized international institutions or multilateral organizations (e.g., the World Bank, FAO, WBCSD);

- 4) independent research data (i.e., empirical data or analyses produced by universities, public research institutes, or non-profit research organizations using documented and reproducible methods), where the data provider has no direct financial, operational, or governance relationship with the project entity; or
- 5) reports or assessments compiled by industry associations.

**Background:**

To resolve confusion among project proponents and VVBs, it is clarified that the barrier analysis per Step 2 of VT0008 must focus only on the proposed project activity. To streamline project reviews and VVB audits, the clarification lists acceptable sources of evidence for the barrier analysis.

## 5 CLARIFICATION 5

**Clarification:**

Section 7 must be read as:

### 7 ADDITIONALITY

[...]

**Step 3: Demonstrate that adoption of proposed individual or combined project activities is not common practice**

Project proponents must determine whether the proposed project is common practice in each region (~~or 'geographic area' as defined for grouped projects in the VCS Standard~~) included within the project area. A project region for demonstrating common practice must be defined by stratifying the project area to the state or provincial level (or equivalent second-order jurisdiction) in the countries where the project is being developed. For grouped projects, the region to be considered is the "geographic area" (VCS Standard, v4.7 and previous versions) or "eligibility area" (VCS Standard, v5.0).

[...]

**Step 3.2:** Where the best available data from the above sources for an individual or combined practice determines that the adoption rate is greater than 20% or the required data is not available, project proponents must demonstrate that the activity is not common practice by applying Step 4c of VT0008. This step involves identifying essential distinctions between the proposed project activity (i.e., an individual or combined practice) and ~~related~~ similar activities that ~~may be captured under~~ per Step 3.1 show an adoption rate higher than 20%. When applying Step 4c of VT0008, the information sources for  $N_{all}$  and  $N_{diff}$  must cover the same ~~geographic area (i.e., the~~ project region as defined in the introductory paragraph to Step 3

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a.), ~~and~~ The analysis must be based on ~~a~~ the land area ~~basis~~ (e.g., hectares) encompassing implementation of the similar activity, rather than the number of projects. The requirement that  $N_{all} - N_{diff}$  must be greater than 3 is not applicable.

For example, a project intends to introduce cover crops as a project activity in the project region where the adoption rate per the government agricultural census is 22% covering approximately 2 million hectares ( $N_{all}$ ). Applying the common practice analysis per Step 4c of VT0008, the project identifies the following essential distinction: government subsidies for cover crop seed are accessed by farmers managing 1.7 million hectares ( $N_{diff}$ ) in the project region. The calculation of factor  $F$  ( $F = 1 - N_{diff} / N_{all}$ ) per Step 4c of VT0008 would therefore yield 15% ( $F = 1 - 1.7 \text{ million hectares} / 2 \text{ million hectares} = 0.15$ ), demonstrating that the proposed project activity is not considered common practice.

#### Background:

To resolve confusion among project proponents and VVBs, it is clarified that the project region must be stratified for the entire common practice analysis and that the analysis applying Step 4c of VT0008 must be based on land area and not on number of projects implementing similar activities.

## 6 CLARIFICATION 6

#### Clarification:

Section 8.1 must be read as:

#### 8.1 Summary

[...]

The entire project area is divided into multiple quantification units that must be demonstrated to be more homogenous than the project area in its entirety, for the purposes of estimating emission reductions and removals (ERRs) (i.e., similar management activities, soil type, climate). In some cases, the entire project area may be considered as one quantification unit. When dividing the project area into multiple quantification units, ~~E~~ estimates of ERRs for each quantification unit within the project area are then aggregated to produce an estimate for the entire project area. In a staged (i.e., hierarchical, nested) design, additional units nested within a primary quantification unit may be implemented resulting in primary, secondary, tertiary, etc. quantification units (see

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<sup>13a</sup> The requirements of Section 5.1 of VT0008 to determine an 'applicable geographic area' do not apply.

Appendix 6 for an example). Quantification units must be clearly defined in the description of the sampling design provided in the project description ~~document~~.

In grouped projects, the determination of different eligibility areas<sup>15a</sup> may be treated independently from potential division into quantification units. Thus, quantification units may span across multiple eligibility areas or represent subdivisions of one eligibility area.

#### **Background:**

To resolve confusion among project proponents and VVBs, it is clarified that the optional division of the project area into quantification units is independent from the determination of eligibility areas in grouped projects per the *VCS Standard, v5.0* (or geographic areas in previous versions of the *VCS Standard*).

## 7 CLARIFICATION 7

#### **Clarification:**

Section 8.2.1.4 must be read as:

#### 8.2.1.4 Measurements of SOC Content

[...]

The selection of an analytical laboratory should be based on its listing as an approved analytical service provider of SOC measurements according to national and/or international standards/accreditation. Where possible, the selected analytical laboratory should be ISO/IEC 17025 accredited. All samples throughout the entire project lifetime should be analyzed in the same laboratory. A change of analytical laboratory requires justification. The project proponent must ensure that soil analysis methods and procedures remain consistent even if there is a change of laboratory. Where the project adopts a new eligible method when adopting a new version of the methodology (e.g., a proximal sensing method per Appendix 4), project proponents or their technical service providers must demonstrate the comparability of previous measurements with new remeasurements, and, where necessary, justify the use of conversion factors.

#### **Background:**

As part of the continuous improvement of *VM0042*, revisions have expanded the eligible methods to measure and estimate soil organic carbon (SOC). The added provisions clarify that projects are

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<sup>15a</sup> Geographic area per *VCS Standard, v4.7* and previous versions

allowed to adopt new eligible methods where the project proponent demonstrates that results remain comparable over time.

## 8 CORRECTION 1

### Correction:

The following changes must be made to Section 8.2.7:

### 8.2.7 Methane Emissions from Manure Deposition

[...]

$$VS_{l,i,t,P} = \text{Average volatile solids excretion per head for livestock type } l \text{ in quantification unit } i \text{ for productivity system } P \text{ in year } t \text{ (kg volatile solids/}$$
~~(head × day)~~

### Background:

The unit of parameter  $VS_{l,i,t,P}$  in Equation (12) incorrectly included “× day.” This unit is not required as values are already multiplied across the whole year when calculated using Equation (13).

## 9 CLARIFICATION 8

### Clarification:

The following additions must be made to Section 8.3:

### 8.3 Project Emissions

[...]

#### Quantification Approach 2

Quantification Approach 2 is used to estimate emissions from SOC stocks only.

Remeasurements in both baseline control sites and the project area must be conducted at least every five years, or prior to each verification event where verification occurs more frequently.

SOC stocks in the project scenario ( $SOC_{wp,i,t}$ ) are calculated on an equivalent soil mass (ESM) basis by multiplication with the SOC content in each quantification unit or stratum at time  $t-1$ , directly measured in each sample field. Where bulk density is measured in a fixed depth approach, mass corrections may be applied to meet the ESM requirement.

[...]

## Background:

A clarification was added elucidating that the remeasurement frequency of five years is applicable to both baseline and project scenarios under Quantification Approach 2.

## 10 CORRECTION 2

### Correction:

The following changes must be made to Section 8.4.3:

### 8.4.3 Accounting for Leakage from Production Declines

[...]

- 4) Use the outcome of Equation (10) from *VMD0054, v1.0* to quantify annual leakage from displaced production as follows:

$$LK_{disp,t} = \frac{\text{MAX}(0, LK_t - LK_{prior})}{years} \quad (36)$$

Where:

$LK_{disp,t}$	= Leakage emissions from <del>livestock displacement</del> displaced production in year $t$ (t CO <sub>2</sub> e)
$LK_t$	= Cumulative leakage up to year $t$ calculated using <i>VMD0054</i> (t CO <sub>2</sub> e)
$LK_{prior}$	= Cumulative leakage between $y = 0$ and the previous verification event, calculated using <i>VMD0054</i> (t CO <sub>2</sub> e)
$years$	= Duration of the verification period (years)

## Background:

Parameter  $LK_{disp,t}$  was incorrectly defined as leakage emissions from livestock displacement in year  $t$ .

## 11 CORRECTION 3

### Correction:

The following additions must be made to Section 8.5:

### 8.5 Net Reductions and Removals

[...]

Leakage allocated to emission reductions ( $LK_{ER,t}$ ) is calculated as:

$$LK_{ER,t} = (LE_{OA,t} + LK_{disp,t} + LE_{BR,t}) \times \frac{ER_t}{ER_t + CR_t} \quad (39)$$

Where:

$LE_{BR,t}$  = Leakage emissions from the diversion of manure or crop residues from baseline energy applications in year  $t$  (t CO<sub>2</sub>e)

$LK_{disp,t}$  = Leakage emissions from displaced production in year  $t$  (t CO<sub>2</sub>e)

$CR_t$  = Estimated carbon dioxide removals in year  $t$  (t CO<sub>2</sub>e)

[...]

Leakage allocated to carbon dioxide removals ( $LK_{CR,t}$ ) is calculated as:

$$LK_{CR,t} = (LE_{OA,t} + LK_{disp,t} + LE_{BR,t}) \times \frac{CR_t}{ER_t + CR_t} \quad (42)$$

#### Background:

The parameter for leakage from production declines was inadvertently omitted from the leakage emissions equations. This correction serves to include the missing parameter in the sum of all leakage sources and ensure reductions and removals are quantified correctly.

## 12 CLARIFICATION 9

### Clarification:

The following changes must be made to Section 8.6.1.3:

#### 8.6.1.3 Remeasurement, Model True-Up and Cumulative Modeling

As outlined in Section 8.3, SOC stocks must be directly remeasured every five years in the project scenario. These data are used to re-estimate model prediction error and/or recalibrate the model in relation to measured SOC stocks. **Since the purpose of remeasurement is improvement of the applied biogeochemical model over time, soil samples do not need to be taken from every project activity instance (i.e., field or management unit) at every remeasurement event. In consequence, the requirement to measure SOC stocks every five years or more frequently (see Section 8.1) does not apply at the project activity instance-level. The stratified random sampling strategy must be redefined as necessary to include changes in the project area (e.g., through the inclusion of new project activity instances). The sampling error associated with not sampling each project activity instance must be calculated accordingly.**

Prior to remeasurement, model structural error during simulation of SOC stocks for initial model validation will be based ~~be based~~ on data from peer-reviewed publications and available datasets meeting the requirements detailed in Section 5.2.3 of VMD0053. Specifically, the model is used to simulate changes in stocks from a set of selected external datasets (i.e., field trials for which data have been previously collected). Following remeasurement (i.e., true-up sampling), data from external datasets and remeasurement within the project area are combined to create a new calibration/validation. If the project proponent so chooses, this dataset may be used to recalibrate model parameters (or parameter distributions in the case of Bayesian models) in an effort to improve model accuracy, although model recalibration is not required. Following remeasurement, project proponents must repeat model validation procedures outlined in VMD0053, submit an updated MVR for IME review and validation, and ~~34~~ update the model prediction error term used ~~in the to-estimation of~~ the project uncertainty deduction.

Once the MVR is approved, project proponents should rerun model simulations for both the baseline and project scenarios from  $t_0$  up to the present day and recalculate uncertainty deductions to be applied to future credit vintages. VCUs that have been issued in previous verifications will remain unchanged.

Figure 4a illustrates the interaction between:

- measurement ( $t_0$ ) and remeasurement ( $t_1, t_2, t_3$ ) campaigns,
- the timing for assessment of an updated MVR, and

- continuous onboarding of cohorts<sup>56a</sup> of project activity instances.

In Figure 4a,  $t_0$  denotes initial measurement,  $t_1$  and  $t_2$  denote subsequent remeasurements, and “cohorts” refer to groups of activity instances added over time, which may be sampled individually or through joint campaigns.

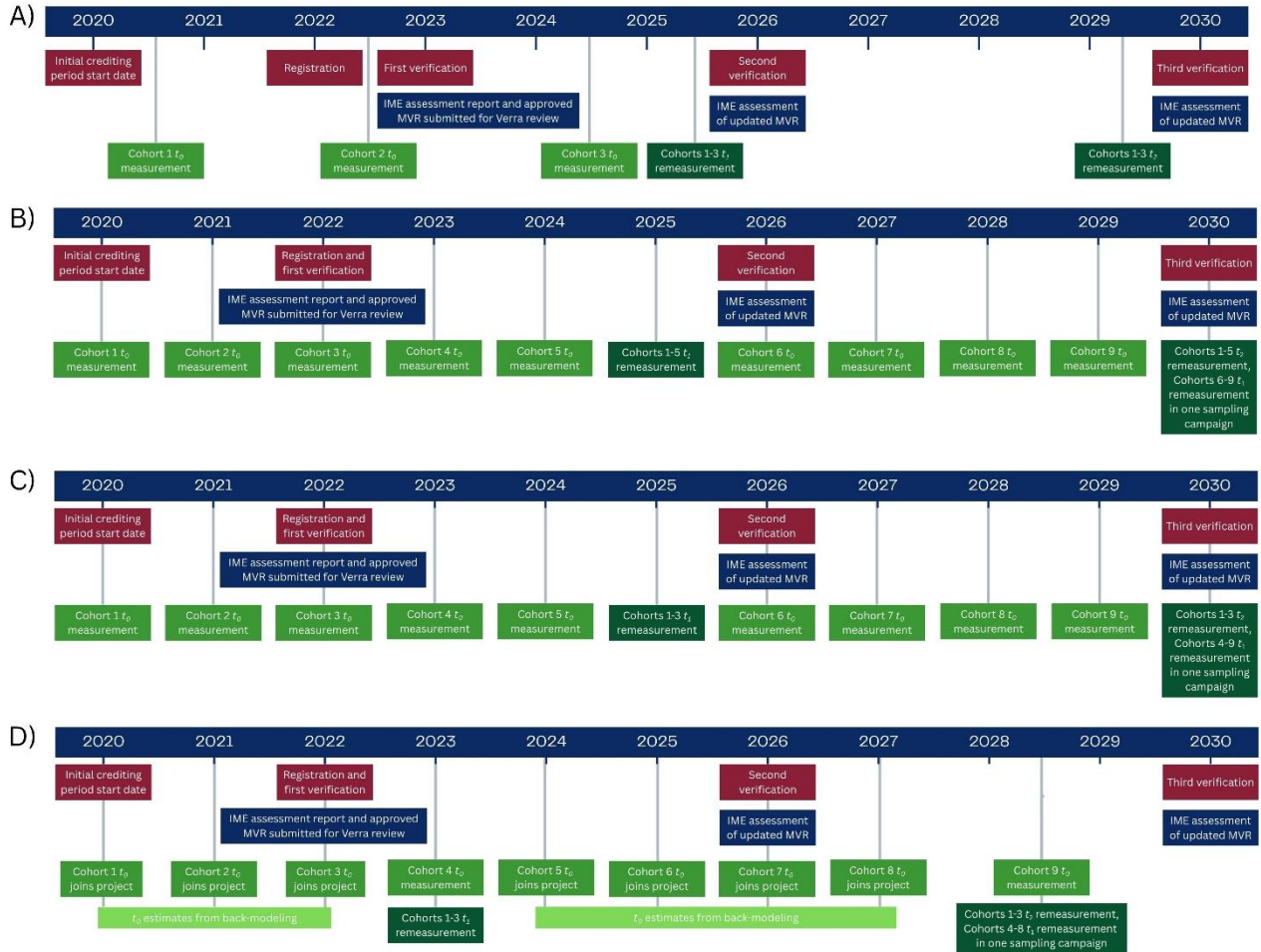
The following scenarios, which all conform to VM0042 requirements, are illustrated in Figure 4a:

- A) Sequential cohorts with synchronized remeasurement:
  - Cohorts 1–3 are measured at entry ( $t_0$ ), one per year.
  - $t_1$ : conducted five years after Cohort 1’s  $t_0$ , for all cohorts (1–3).
  - $t_2$ : conducted five years after  $t_1$ , for all cohorts.
  
- B) Sequential cohorts with staggered cohorts and joint sampling:
  - Cohorts 1–9 are measured at entry ( $t_0$ ), one per year.
  - $t_1$  (Cohorts 1–5): conducted five years after Cohort 1’s  $t_0$ .
  - Next campaign (joint): conducted five years after  $t_1$  for Cohorts 1–5, to measure:
    - $t_2$  for Cohorts 1–5
    - $t_1$  for Cohorts 6–9
  
- C) Delayed remeasurement for later cohorts:
  - Same approach as B with a difference for cohorts 4 and 5.
  - Difference:
    - Cohorts 4 and 5 are measured at entry ( $t_0$ ) but remeasured later than the standard interval.
    - Their  $t_1$  occurs after seven and six years, respectively (instead of shorter intervals of one or two years, under joint sampling).
  
- D) Deferred initial sampling with back-modeling:
  - Cohorts 1–3 are not measured at entry; instead, back-modeling is used to estimate  $t_0$ .
  - When Cohort 4 joins, remeasurement campaign serves as:
    - $t_0$  for Cohort 4
    - $t_1$  for Cohorts 1–3
  - Back-modeling is used to estimate  $t_0$  for Cohorts 5–8.
  - Later campaign (when Cohort 9 joins):
    - $t_2$  for Cohorts 1–3
    - $t_1$  for Cohorts 4–8
    - $t_0$  for Cohort 9

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<sup>56a</sup> It is assumed that multiple project activity instances may be onboarded at different times during a monitoring period. The term cohort is therefore used to refer to all instances added to a project within a given year. This differs from the concept of a batch under the VCS Standard, v5.0, which refers to groups of instances added at a verification event and may include one or more cohorts.

**Figure 4a. Interplay between adding project activity instances over time, remeasurement intervals, options for back-modeling, and updates to the MVR**



**Background:**

The added explanations clarify how the continuous onboarding of agricultural producers and addition of new project activity instances interact with the remeasurement and model true-up requirements as well as the timing for revalidating the model validation report (MVR).