SUMMARY OF PUBLIC CONSULTATION

VM0051 Improved Management in Rice Production Systems, v1.0

A draft of *VM0051 Improved Management in Rice Production Systems, v1.0*, was open for public consultation between June 11, 2024 and July 12, 2024. This document includes a list of all comments received and the developer's response.

KEY QUESTIONS

Q1: With respect to when this methodology should be used, versus alternatives such as VM0042, is the guidance in the Applicability Conditions (8) and (10) (Section 4) sufficiently clear?

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#	Organization	Comment	Developer's Response
1 - 17	[redacted]	[redacted]	**The following response addresses comments 1 – 17:** Thank you for the feedback. The guidance regarding safeguards to stop implementing project activities that could result in soil carbon loss has been revised and updated accordingly; please refer to Section 4 for more details. Further guidance has been added throughout the methodology to improve clarity concerning safeguards regarding SOC stock changes and whether a project activity is eligible under VM0051 or VM0042.
1	Regrow Ag	No. The understanding we have regarding the consequences of expected SOC decline is either the field becomes	See first row of this table.

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		ineligible and therefore should be removed from the program (and potentially registered under VM0042), OR QA1 should be used to determine the SOC decline and account for declines in outcomes. We have also requested clarification (in the general comments section) on how to determine if off-season management changes. Does this data need to be collected to some degree throughout the program? In addition, are fields still ineligible if off-season changes occur due to non-project related reasons (e.g., business, financial reasons)?	
2	Anonymous	We believe the requirements of applicability condition 10 to be too constrictive (particularly when considering the livelihoods of farmers). See General Comment on this point.	See first row of this table.
3	Green Carbon, Inc	It is clear	See first row of this table.
4	University of Uppsala	Yes. However, the use of the words 'materially smaller' and 'material decline' and elsewhere in the draft the use of term material is used excessively. It would help if actual stoichiometric adjectives were used here and throughout the document. Please consider defining what these changes are statistically. Else, this can give way to misinterpretation.	See first row of this table.

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5	Anonymous	What about the introduction of rice management practices that deviate from the historic off-season approaches with the introduction of beneficial livestock i.e., ducks. Whereby ducks provide a reduced need for fertiliser and reduce pest outbreaks, but they are not ordinarily in the system.	See first row of this table.
6	String Bio	There are specific clauses within the methodology, as listed below, that are unclear. Clarification/Updating of these would be helpful. Current Clause Point 10. Projects change off-season (i.e., outside of the cultivation period) management practices (e.g., crop rotations, crop types, and/or livestock management must not deviate from historical off-season management practices) Feedback - From the above clause it is not clear if the methodology excludes regions where off-season practices already include crop rotation or if this can be included. This lack of clarity also stems from the language in the methodology with regards to historical practices being included.	See first row of this table.

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		- If the methodology does not allow for crop rotation, this will exclude a significant portion of rice farms in traditional rice producing regions. For e.g.: The rice-wheat rotation is the principal cropping system in south Asian countries that occupies about 13.5 million hectares in the Indo-Gangetic Plains (IGP), of which 10 million hectares are in India, 2.2 million hectares in Pakistan, 0.8 million hectares in Bangladesh and 0.5 million hectares in Nepal. This cropping system is dominant in most Indian states, such as Punjab, Haryana, Bihar, Uttar Pradesh and Madhya Pradesh, and contributes to 75% of the national food grain production. - Crop rotation is a widely accepted practice of land management and offers multiple benefits like enhanced soil health, reduced pest incidence, and increased carbon sequestration. Crop rotation is a sustainable farm management practice that helps to maintain soil organic matter, reduces erosion, disrupts insect and pathogen life cycles, and restores plant nutrients, thereby reducing the need for chemical fertilizers. - Farmers in some of these regions in India are progressive farmers interested in sustainable practices. Excluding crop rotation from the methodology would deny them the opportunity to participate in	

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		carbon offset programs despite being open to deploying GHG abatement practices. - Given increasing climactic variability like off-season rains, acute rainfall over short durations, season shifts etc., insisting that the farmers have a single crop may restrict the scalability of the carbon projects.	
7	NetZeroAg	Yes	See first row of this table.
8	AgriCapture, Inc	AgriCapture determines Applicability Condition (8) to be sufficiently clear; however, we need further clarification on the meaning of condition (10). We should not restrict a field's ability to implement more sustainable off-season management practices by participating in a M0253 project. At Applicability Conditions (4) optional activities (2) D and E, the methodology explicitly allows for the inclusion of offseason optional activities, avoided burning of rice residues and improvements in nitrogen management. If a field has historically burned offseason residues and implemented AWD as its main project activity, the methodology should incentivize, not penalize, the adoption of additional environmental best practices. This "stacked" practices concept is allowed under Verra's VM0042 methodology and encouraged under Climate Action Reserve's Soil Enrichment Protocol. Additionally, even though this	See first row of this table.

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		methodology is not meant to address SOC management practices, it should not penalize farmers for performing cover crops. Farmers should be able to enter these practices changes in VM0042 or other relevant protocols. Lastly, participation in this program should not restrict farmers to the historical crop rotation patterns. The methodology should allow farmers to adapt to the current needs of their operations. We would like additional guidance on (10) and how routine rice crop rotations are factored into a field's baseline in the project.	
9	The Nature Conservancy	Yes, this guidance in the referenced Applicability Conditions is clear.	See first row of this table.
10	Olam Agri Pte Ltd	(8) is surprising but understandable, I assume that the reduction in rice straw (which would impact the carbon emissions from a flooded field) is being separated as it is a separate approach. (10) is clear but seems less obvious as it appears to be in conflict with regenerative agricultural practices emerging especially in rice/wheat systems in India.	See first row of this table.
11	Indigo Ag	Applicability Condition (8) - It is not clear whether the list of practices in AC (8) is meant to be comprehensive. If not, there should be additional language to clarify how one can assess whether an unlisted practice meets the intent of this	See first row of this table.

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		AC. - Are you certain there are not other variables related to the eligible practice changes that would result in them causing material declines in SOC under certain conditions? For example, CAR1513, a project by Agricapture currently registered under the CAR Soil Enrichment Protocol, recently generated some ~37k CRTs based almost entirely on CH4 reductions in rice systems. The verification report for this most recent reporting period noted that the project activities resulted in a net negative impact on SOC flux when compared to the baseline. I believe the result was around 500 tonnes, or around 1.3 to 1.4% of the total project impact. At scale, this is a material, negative impact on SOC that would presumably go unaccounted under this proposed methodology. This is not to say that SOC cannot be excluded, but rather to highlight that there are conditions under which SOC either must be quantified, or perhaps a deduction must be applied if the project elects not to quantify the actual SOC impacts. Applicability Condition (10) - I would like to see this language made a bit more clear. What I'm reading here is that for rice fields that rotate with other crops (which is common), the project must demonstrate that the management regime in the project scenario is the same as the	

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		management regime in the baseline scenario. Farmers will adjust their management year over year for purely agronomic reasons that the methodology should not seek to prevent. The question is whether these changes should be reported and the impacts be quantified. Obviously the crop and management regime in the season prior to the rice growing season will materially affect the rice season. - More broadly, how are those farmers meant to be rewarded for climate smart management during the non-rice seasons? You could allow those fields to be enrolled in a VM42 project for those seasons. However, this begs the question of whether the proposed rice methodology should be a standalone methodology or a module of VM42, a possibility that was under consideration by Verra at one point. If the answer here is that Verra will allow a single project to be developed using both methodologies, per the guidance in Sections 3.6.1 - 3.6.3 of the VCS Standard v4.5, then it would be helpful to clarify that in the applicability conditions (perhaps in a footnote).	
12	International Rice Research Institute	6) Project activities do not represent a change in land use. (Does this also exclude moving from triple rice to double rice and leaving the land fallow or growing an upland crop instead of rice in the third season?; 8) Practices that result in material	See first row of this table.

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		declines in SOC or the carbon input rate to soils. For example, increased rice straw removal, decreased application of manure or compost, and introduction of new cultivars known to have a materially smaller root system than the cultivar(s) used in the baseline. (This is not consistent with the information in Table 5: "Emission factors for end use of crop residue diverted from burning or field incorporation" which seems to indicate that a change from field incorporation to another rice straw use can be accounted for and it should not be included for emission accreditation because removal of straw when the baseline is incorporation will affect soil organic content; 10) Projects change off-season (i.e., outside of the cultivation period) management practices (e.g., crop rotations, crop types, and/or livestock management must not deviate from historical off-season management practices). (So changes in pre-season water management timing and the timing of straw incorporation do not count?)	
13	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	In (3) in the same section materiality is defined as 5%, whereas there is no quantitative limit here. That may be confusing. If there is a 5% reduction in SOC from a project activity, with current language, is that material, and this methodology cannot be used?	See first row of this table.

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14	Grow Indigo Pvt Ltd	The section of VM0042 related to Soil Organic Carbon (SOC) is clear.	See first row of this table.
15	Arva Intelligence	For condition (8), what is the threshold for 'materially smaller root system'? For condition (10), for areas where ratoon rice production is common, is this treated as an off season activity?	See first row of this table.
16	TotalEnergies Nature Based Solutions	To improve clarity on the articulation with VM0042, applicability conditions 8 and 10 could be merged into a single point listing the practices that are expected to increase/decrease SOC	See first row of this table.
17	VGS	The System of Rice Intensification (SRI) is a farming method that aims to increase rice yields while reducing environmental impact and using fewer resources and SRI can save 15–20% of water compared to traditional methods. Therefore SRI also should be considered as an improved irrigation management practice	See first row of this table.

Q2: What are the limitations or gaps in the current approach concerning the exclusion of the SOC pool (Sections 4 and Section 5, Table 1)? Are there any considerations that may have been overlooked in determining this exclusion in a global context?

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18-32	[redacted]	[redacted]	**The following response addresses comments 18 – 32:** Thank you for the feedback. The methodology guidance has been revised as follows: 1. Revision of Section 3 Definitions: update of the terms and addition of new ones 2. Revision of Section 4 Applicability Conditions: removal of 'Dry-cultivated water-saving and drought-resistant rice' as eligible project activity; further guidance on not applicable practices and project activities that could impact SOC stocks as well additional guidance on management during the off-season 3. Revised guidance of Section 8 Quantification of Reductions, QA1, and requirements for initial SOC sampling as per the guidance of VM0042/VMD0053. 4. Updates on the text throughout the methodology to clarify the user case, i.e., project activities eligible under VM0051 and other project types that could be suitable to VM0042 (e.g., projects seeking to credit emissions removals for SOC stock changes)
18	Regrow Ag	No gaps however we have highlighted that soil samples can be inaccessible in rice systems and may significantly impact the scalability of a program. Therefore, we	See first row of this table.

Q2: What are the limitations or gaps in the current approach concerning the exclusion of the SOC pool (Sections 4 and Section 5, Table 1)? Are there any considerations that may have been overlooked in determining this exclusion in a global context?			
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		recommend allowing SOC, clay, and other soil values to come from other reliable data sources if applied conservatively.	
19	Anonymous	When considering the SOC pool, the VCS standard requires a minimum crediting length of 20 years, but projects seeking to reduce CH4 emissions have a maximum crediting period of 10 years. The methodology is unclear on which is the requirement.	See first row of this table.
20	Green Carbon, Inc	It is clear	See first row of this table.
21	University of Uppsala	The exclusion of SOC accounting is a wise move. However, clear documentation of the trade-offs and interdependence of CH4, N2O and SOC needs to be explicitly described in an additional section. Referring to some relevant studies (e.g., 10.1038/s43247-021-00229-0) might provide better handling of the cases by both project developers and validators. While these are obvious for subject experts, project developers and validators often lack these skills and slow down validation-verification steps.	See first row of this table.
22	Anonymous	Clear	See first row of this table.
23	NetZeroAg	The practice of D-WDR is mentioned as an eligible mitigation practice without given further explanations on its implementation.	See first row of this table.

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		In contrast to AWD, this practice is lesser known to the public and may need further elaboration. According to our web search, some sources encompass a water regime similar aerobic rice under this term. However, this practice is prone to result in substantial SOC losses which contradicts the underlying assumptions of the methodology.	
24	AgriCapture, Inc	None Noted	See first row of this table.
25	The Nature Conservancy	We feel the exclusion of the SOC pool is acceptable given the conditions stated in Section 4. However, we fell the justification stated in Table 1 could be improved since safeguarding against declines in SOC isn't the sole reason that the SOC pool is excluded. Additionally, it seems contradictory and confusing to include the SOC pool in Table 4 (Section 8) when it is not a credited pool. The methodology states that SOC fluxes must be modelled but does not explain why or how changes in this pool should be reported. The expectations and requirements for reporting on the SOC pool when using QA 1 should be further clarified.	See first row of this table.
26	Olam Agri Pte Ltd	Does this mean SOC improvements are inclusive within this framework? For instance, would a biochar project that	See first row of this table.

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		converted rice husk to biochar and returned the husk biochar to the soil be eligible for separate consideration, This seems to consider the straw conversion only. (Table 5)	
27	Indigo Ag	Please see comment for key question 1.	See first row of this table.
28	International Rice Research Institute	Need to clarify that the switch to Direct Seeded Rice is the entire "DSR" package which includes a change from continuous flooding to intermittent drainage in addition to the change from transplanted to direct seeded. The change alone from transplanting to direct seeding does not lower emissions (the crop duration is extended and therefore emissions actually increase). The emission reduction comes from the change to intermittent drainages. If changes to pre-season flooding management will be included, DSR will also have an emission reducing effect but only if the baseline is more than 30 days of flooding, unless a system change will also be considered (double rice to rice-wheat for example as this could extend the dry period between rice seasons to longer than 180 days). Defining applicability to Dry Direct seeded rice would be an option as this clearly indicates moving from a flooded system to an aerated system but this will also have implications on SOC, which is not allowed under this methodology.	See first row of this table.

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29	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	The main limitation is that it forces project developers who consider a broader systemic change to rice farming practices that includes both reduction of CH4 and improvement in SOC to develop two separate projects. Maybe the new methodology can support the use of two separate methodologies and two projects by clearly allowing (or even recommending) the VM0042 project component to mirror as much of the baseline and project data from this new methodology with regards to e.g. stratification etc. For instance if a developer wants to do a project with combined methodologies, then only SOC calculations would be required under VM0042, and allow the developer to rely on documentation for this methodology to also cover parts of VM0042.	See first row of this table.
30	Grow Indigo Pvt Ltd	No limitations are foreseen for exclusion of woody biomass SOC pool as per Table 1. Excluding practices that may result in lowering of SOC is acceptable and relevant and necessary to this methodology.	See first row of this table.
31	Arva Intelligence	Initial SOC in rice production varies by region. For example, Arkansas rice fields have lower SOC than California rice fields, which has implications on how much SOC can be lost. What is the burden of proof to meet the applicability condition of no SOC loss. Adding a need to monitor SOC, even	See first row of this table.

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		though crediting is not possible, creates a burden for project developers.	
32	VGS	GAPS: Underestimation of Carbon Fluxes: SOC plays a significant role in the global carbon cycle. Excluding it can underestimate the total carbon storage and emissions associated with land-use changes. Variability in SOC Dynamics: SOC levels vary greatly depending on factors like climate, vegetation, and land management practices. A blanket exclusion might not capture these challenges. Potential for Misinterpretation: Excluding SOC might lead to a misleading impression that land-use changes have a lower carbon footprint than they actually do. **Overlooked Considerations (Global Context):** Importance of SOC Sequestration: Healthy soils with high SOC levels act as carbon sinks, mitigating climate change. Excluding SOC might downplay the potential of land management practices that enhance SOC storage. Regional Differences: The impact of land-use changes on SOC varies significantly	See first row of this table.

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		across regions. A globally uniform exclusion might not reflect these regional variations. Long-Term Impacts: Changes in SOC levels can have long-term consequences for soil health and ecosystem services. Excluding SOC might overlook these long-term effects. **Possible Solutions:** 1. Develop tiered approaches that account for SOC based on land-use type, climate, and management practices. 2. Integrate SOC considerations into global carbon accounting frameworks. By acknowledging these limitations and considering the global context, a more comprehensive understanding of the carbon impacts of land-use changes can be achieved.	

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?

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#	Organization	Comment	Developer's Response
33-49	[redacted]	[redacted]	**The following response addresses comments 33 - 49:** Thank you for the comments. The methodology has been revised, and now, it has additional appendixes with guidance regarding the stratification of the project area and guidance for CH4 fluxes - direct chamber measurements; please refer to Appendix 1 and 2. In this appendix Table 5 (former Table 3), there is a list of parameters to be considered for stratification. Also, further guidance has been added to this table to clarify whether a parameter should be a mandatory or optional criterion for stratification, allowing greater adaptability to diverse project-specific conditions.
33	Anonymous	As fertiliser does not significantly contribute to methane emissions, and the methodology permits emission factors for calculating N20 emissions from fertiliser, we believe fertiliser amount is not needed as a mandatory stratification. Instead, N20 emissions from fertiliser can be calculated basis per-field data captured from farmers, and the appropriate EF's can be used to calculate emissions. Thus fertiliser usage should be made an optional stratification requirement. Cultivation season duration is another mandatory stratification requirement that could be made optional.	See first row of this table.

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
#	Organization	Comment	Developer's Response
		Analysis has shown that the mandatory stratification demonstrated in the draft version of the methodology could increase direct sampling costs by 10x compared to the Gold Standard methodology, which is clearly material enough to make the VCS methodology unattractive in comparison.	
34	Green Carbon, Inc	The cultivation season duration of rice varieties is necessary because late maturing varieties (long duration) increase CH4 emissions. In general, farmers today often use early maturing varieties (short duration) with quite similar growth duration. Nitrogen use often has less to do with CH4 emissions and more to do with N2O emissions. However, the gap between fertilizers is quite large, so it should be reduced as suggested (<90; 90-150; 150-210; >210).	See first row of this table.
35	University of Uppsala	Yes, these two would be crucial and this should be retained.	See first row of this table.
36	Bayer BioScience Private Limited	•Nitrogen fertilizer application is categorized into four broad groups. There is no particular pattern in Nitrogen fertiliser use even for specific locations. Nitrogen fertiliser use is individual decision of the farmer which varies from farmer to farmer and even plot to plot owned by the same farmer. The purpose of stratification is to define the number of direct measurements needed.	See first row of this table.

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		As fertiliser does not significantly contribute to methane emissions and the methodology permits emission factors for calculating N20 emissions from fertiliser, we believe fertiliser amount is not needed as a mandatory stratification. Instead, N20 emissions from fertiliser can be calculated basis per-field data captured from farmers, and the appropriate EF's can be used to calculate emissions. Making this parameter mandatory will increase the number of strata 4 times. We request Verra to remove this requirement from the list of mandatory parameters for stratification. •Cultivation season duration is mandatory for stratification per Table 3 (Section 6), but the document lacks clear guidance on the categories. The IRRI defines crop durations as short (100–120 days), medium (120–140 days), and long (160+ days). For transplanted rice, it is not clear whether nursery sowing or transplanting dates are considered as starting dates. Crop durations vary across practices and locations even for the same cultivar, complicating standardization (e.g., for the same cultivar, the crop duration can be different for the transplanted cultivation vs DSR). According to the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, daily emission factor can be developed from field measurements using the closed	

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		chamber technique by dividing total seasonal emission by crop duration. Additional measurements are unnecessary. Cultivation season duration is unlikely to have any significant impact on the daily emission factor. Making this parameter mandatory will increase the number of strata 4 times significantly adding to the cost. We request Verra to remove this requirement from the list of mandatory parameters for stratification. •Organic amendment application rates also lack clear guidance. Organic amendment application rate depends on several factors like the harvesting practice followed (machine harvesting vs manual harvesting), biomass of the harvested crop, alternate residue management practices (e.g., burning, removal etc). Application rates vary even within specific locations and depend on such factors. Therefore, not all the three (low, medium, high) qualities should be mandatory for the measurement. The application rate to be considered for the stratification should be based on the locally prevalent dominant farming practice (i.e.., machine harvesting or manual harvesting). For the marginal cases of organic amendment rates limited to a few quantification units, use of IPCC scaling factors should be allowed along with the associated uncertainty deductions.	

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		•As per stratification criteria (for Quantification Option 2 Direct Measurement) in Table 3 (Section 6) organic amendment (type) is mandatory for stratification. This means the addition of at least three variations (compost, green manure and farmyard manure) in the measurement design. Measurement requirements get multiplied by three. Enormous cost impact. In most parts of India, the practice of using compost, green manure and farmyard manure as an organic amendment is relatively limited. A very small proportion of farmers in each geography apply such organic amendments. The cost of direct measurement does not justify the potential of emission reductions from such a small number of farms / quantification units. Also, it would not be ethical to exclude the farmers following such practices from the project in the absence of the direct measurement of the specific organic amendment type. We request Verra to allow the use of IPCC scaling factors with the associated uncertainty deductions for the organic amendment types other than the rice straw incorporation. •All these additional mandatory parameters—nitrogen fertilizer usage, cultivation season duration, organic amendment quantity and type—increase the number of strate by twelvefold, making	

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		direct measurement costs prohibitive at approximately 24 to 27 million USD for a single measurement year. For a large scale project in a country like India, measurements in every mandatory stratification combination may be required. In such a scenario, over more than 3 million measurements would need to be taken per year. This is based on having 1728 strata combinations (across continuous flooding, single drainage and multiple drainage), requiring 4032 measurement sites and therefore over 12,000 chambers. According to the methodology, for a 10-year project duration, two measurements are required at five-year intervals. Therefore, the total measurement cost over the project duration will be between 48 to 54 million USD, not accounting for inflation. This cost will be challenging for any rice carbon project developers to afford, rendering the project commercially non-viable. *Refer cost calculation model sheet •A three-year historical look-back is required for baseline emission estimation as per the proposed methodology. However, collecting reliable data from farmer interviews over such a time frame is challenging since it is difficult for farmers to remember all these data points for the preceding three years. Remote sensing can only track water regimes and	

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
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		cultivation duration, not organic amendments or nitrogen fertilizer rates. "	
37	Anonymous	"There still remains a need for reasoning why upland and rainfed and deepwater rice were left out of the methodology? 9) Rice is grown under upland, rainfed, or deep-water rice production techniques. 10) Projects change off-season (i.e., outside of the cultivation period) management practices (e.g., crop rotations, crop types, and/or livestock management must not deviate from historical off-season management practices)."	See first row of this table.
38	String Bio	Feedback: Nitrogen fertilizer usage and cultivation season duration are critical criteria for effectively stratifying. However, we recommend that nitrogen fertilizer usage is made optional requirement. Our rationale for this change is listed below: 1.The nitrogen inputs do not directly impact CH4 emissions. Including nitrogen inputs should be mandatory in the context of N2O direct measurement, but such inputs have no material bearing on CH4 inputs. 2. Fertilizer usage quantities can differ within same agro ecological zones based on soil Nitrogen levels. Rice cultivation is dominated by small holding farms and there is high variability from farmer to farmer and with on-field application rates	See first row of this table.

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
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		within a region. (Summarized in adoption studies conducted by Agriculture universities in Punjab/Harayan, key rice growing region in India). 3. While the government recommended fertilizer dosage data will be readily available, information on farm to farm use variability will not be as readily available.	
39	NetZeroAg	The distinction of 4 classes of N-fertilization rates seems sufficient, but it is not clear if those quantities refer to the rates per season or per year.	See first row of this table.
40	AgriCapture, Inc	"With respect to the cultivation period definition, we believe the current definition defined on page 6 is too broad. The metric used in stratification should be amount a time a field is flooded. This could be define as the inundation period, or the number of days from the initiation of irrigation to irrigation termination and field draining. With respect to Nitrogen Fertilizer, please find the current categories of N application below (in imperial units): -<89 labs N/ac -90-179 labs N/ac -180-267 labs N/ac ->277 labs N/ac If these are the categories that will be used for quantification, then the 180-267 category could be a problem for most rice	See first row of this table.

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#	Organization	Comment	Developer's Response
		growers in the US. Published data indicates that the N2O emissions start to increase rapidly over 230 labs of N. As such, we would prefer to see a cutoff near this range. In a scenario where a grower has a baseline of 250 labs N and changes application to 185 labs N (in the quant scenario), there would be no improvement according to the current categories. However, the grower has significantly reduced non CH4 direct emissions.	
41	Olam Agri Pte Ltd	There is developing science around this but Nitrogen Fertilizer differs by type (e.g. Urea vs Ammonia) and practice (e.g. encapsulated or injected). It is unclear how this is accounted for within the document (8.2.4). Seasonal duration due to weather fluctuations across months should also be impacting CH4 emissions in rice fields.	See first row of this table.
42	Indigo Ag	Is it necessary at all to be this prescriptive with the stratification guidance? While there are benefits to pre-stratification, for there can also be drawbacks, such as inability to handle fields that change practices in a way that they should move to another stratum. In Indigo's Soil Enrichment project with CAR, we have found that the benefits of pre-stratification based on biogeophysical/chemical characteristics were outweighed by the statistical complications such stratification	See first row of this table.

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
#	Organization	Comment	Developer's Response
		would present over time as the project grows and farmers make agronomic decisions. On the other hand, pre-stratification is likely necessary for measurement-only projects in order to properly setup the paired control sites. We suggest at a minimum that project proponents have the option to propose and justify an alternative stratification approach during project validation.	
43	International Rice Research Institute	It should say "Flooded for more than 30 days" so that producers that flood for less than 30 days will know they should select the option of flooding for less than 180 days. Straw on-season and straw-off-season should be defined so it is clear that incorporation of straw from the previous season is counted as straw off-season and burning after the crop is harvested is counted as straw in-season.	See first row of this table.
44	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	It would seem reasonable to allow for the nitrogen fertilizer input to use the average of the whole project area and not require direct measurement on control site, as the application of the fertilizer and the set-up of the control site at each strata may not coincide and cause challenges in project design and management.	See first row of this table.
45	Grow Indigo Pvt Ltd	In this section, nitrogen fertilizer usage and cultivation season may be necessary only when larger project areas (stretching to	See first row of this table.

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
#	Organization	Comment	Developer's Response
		two-four different states) are being stratified since different strata may reflect different N additions based on the season duration and soil N requirements. For smaller project areas including one-two states, this condition may not really be necessary, since the N additions/requirements and crop season duration may not really be different.	
46	Arva Intelligence	yes	See first row of this table.
47	Ostrom Climate Solutions	For cultivation season duration, it should be clarified/separated into short, medium, and long duration varieties. Within these thresholds, the exact number of days of the cultivation season should not have material changes to the GHG emissions. Making project developers stratify by the exact length of the cultivation season (e.g., a cultivation season difference between two farmers of only one day would mean different strata and therefore additional sample sites) will be costly and will not make a material difference to GHG emissions reductions claims. Furthermore, the cultivation season duration can have slight differences year over year due to weather and water availability so this can complicate the 3-year historical lookback/setting of the schedule of activities.	See first row of this table.

Q3: With respect to the stratification criteria (for Quantification Option 2 - Direct Measurement) in Table 3 (Section 6), are the elements with respect to nitrogen fertilizer usage and cultivation season duration necessary for stratification for CH4 direct measurements purposes?			
#	Organization	Comment	Developer's Response
48	TotalEnergies Nature Based Solutions	"Cultivation season duration is in our view an important stratification criteria for quantification option 2, as the length of cultivation/flooding impacts CH4 emissions To the extent N2O emissions are not being measured, integrating nitrogen fertilizer rate in stratification criteria seems less relevant for quantification option 2. "	See first row of this table.
49	VGS	It shouldn't be mandatory and need to be optional and or dynamic as the use may be different or nil when intervention of organic amendment	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
50-67	[redacted]	[redacted]	**The following response addresses comments 50 - 67:** Thanks for the feedback. The methodology has been revised as follows: 1. Revision of Section 7 Additionality: adoption of the new VCS tool VT0008 Additionality Assessment with

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
	[redacted]	[redacted]	expanded and comprehensive guidelines; permanence of the 20% threshold for common practice analysis, in line with the VCS ALM methodologies guidance; clarifications concerning acceptable data sources and geographical coverage information used to support the assessment of common practice within a given area. 2. Revision of Section 9 Monitoring: additional guidelines on data collection as well the use of technologies for the collection of auxiliary data, e.g., remote sensing and DMRV (Appendix 4)
50	Regrow Ag	We believe the data source options provide enough flexibility to determine common practice	See first row of this table.
51	Anonymous	Common practice is assessed at the provincial or state level. Thus, projects are ineligible due to failing under additionality, if AWD is practiced by more than 20% of farmers within a particular state or province. This seems quite a constraining clause that would exclude a lot of areas where AWD is not uncommon (particularly at a district or drainage management level), but CF still remains a practice used by many. We believe common practice should be assessed at a more granular scale than state or province.	See first row of this table.
52	Green Carbon, Inc	If satellite data is used, is it possible to treat it as evidence data for monitoring purposes? What kind of satellite algorithms are you	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		envisioning to use? If we were to consider utilizing satellite data for water level measurement in the future, what challenges would need to be addressed to make it applicable? *Step 3; page 14 ""Evidence must be provided in the form of publicly available information contained in"" should be clarified: Evidence must be provided in the form of publicly available information contained in at least one of the following forms (where possible, multiple forms of evidence are recommended)."*	
53	University of Uppsala	I state this from a validator's perspective. Quite often, these sections are open to interpretation (or misrepresentation) and are difficult to establish for the project proponents and the validators to assess. Thus, an explicit section stating the preferred source of supporting data and how to build this point is necessary. VM0042 v2 does this quite well. Such clear text can greatly help project proponents and speed up the validation process.	See first row of this table.
54	Bayer BioScience Private Limited	A three-year historical look-back is required for baseline emission estimation. However, gathering reliable data from farmer interviews over this period is challenging. Remote sensing can track water regimes and cultivation duration but cannot monitor organic amendments or nitrogen fertilizer rates. Therefore, if a	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		three-year data collection period is mandatory, only water regime and cultivation season duration should be required. Alternatively, if the look-back period is reduced to one year, all necessary data collection becomes feasible.	
55	Anonymous	It can be difficult to ascertain this information from smallholders and given the size of some rice growing countries, advice is that there is a need for a higher threshold for common practice test and to have regional (specifically provincial checks as sufficient) Yunnan for instance has shown low adoption rates but other provinces have become high adopters. These aspects should allow for a regional approach.	See first row of this table.
56	String Bio	"The sources mentioned to gather the data for demonstration of common practice are fairly exhaustive.	See first row of this table.
57	NetZeroAg	We encourage the guidelines to explore the potential of satellite data to deliver actionable information on rice paddy emissions of methane.	See first row of this table.
58	AgriCapture, Inc	Utilizing agriculture census and survey data, we believe we would be able to establish common practice in our project region for most activities; however, situations could arise where there is limited	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		data for a specific practice. This could be an indication that the practice has not been identified as having wide spread use by the government. If the government is not tracking data on a practice, project developers could assume the practice is not common place. We believe the addition of a default clause for instances where data is not available is appropriate.	
59	RiceTec	While RiceTec is not a project developer, as the only company focused only on hybrid rice seed (with research and development, production, sales and marketing of rice seed) we do have direct relationships with rice farmers in the United States, Mercosur, and India and have a good understanding of their operations. The number of data points that are required for the methodology are significant and will burden the farmers. They are more likely to be able to provide data for the current grow season, especially if effective tools and significant support is provided. However, providing historical information, whether for small fields in India or big fields in the United States, is quite challenging. Improvements to the guidance could include collection of a small number (5-10) data points that are most important to estimate a more generalized amount of historic emissions. Another option is to develop an emissions factors for the different irrigation practices (as has	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		been done with end use activities in Table 5) and use those as the baseline.	
60	Olam Agri Pte Ltd	Should be possible in most regions but some frontier economies may struggle (underdeveloped rural areas in Asia and Africa may lack available data and require higher investment). It will very much depend on "qualified local expert". For instance, does this include an OxFam or GIZ? Would a local NGO be able to provide attestation (e.g. Pradan)? Can a community leader offer evidence?	See first row of this table.
61	Indigo Ag	No, the list provided in step 3 seems to offer a reasonable amount of flexibility to enable project development in a variety of jurisdictions and local contexts.	See first row of this table.
62	International Rice Research Institute	Yes, it will be difficult to determine additionality based on the criteria in step 3 because there is no country in the world that collects the data required to estimate baseline emissions using statistically available data. The guidance can be improved by providing a standardized questionnaire for project developers to use when doing an initial survey to determine additionality because the terminology is not consistent between the drainage definitions (i.e., drainage event must be -15 cm to be included but practically no farmers are physically measuring the water in their fields and therefore would not be able to	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		answer this accurately). It would be quite easy to develop a questionnaire that results in the responses a project developer wants (high continuous flooding) by using terminology that farmers may be unfamiliar with or defining drainage differently than is required for this methodology.	
63	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	There should be an exclusion for undertaking a common practice analysis, first-of-kind solutions (e.g. Microbial solutions) that have evidently not been used outside of scientific trials.	See first row of this table.
64	Grow Indigo Pvt Ltd	There should be more clarity on point 5 of step 3 for section 7. Any guidance on what datasets needs to be provided along with grower survey for accuracy and reliability of the dataset from growers survey. Also, are the 7 points in step 3 independent of each other to prove common practice in a project region? In absence of evidence from publicly available information contained in: 1) Agricultural census or other government (e.g., survey) data; 2) Peer-reviewed scientific literature; 3) Independent research data; 4) Attestation statement from a qualified independent local expert (e.g., accredited agronomists affiliated with official agricultural institutions supporting rice production such as the International Rice Research Institute); 5) Grower survey	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		conducted within the project region; 6) Reports or assessments compiled by industry associations; or 7) Data compiled using remote sensing datasets, data from news articles/ reports/national level datasets should also be allowed to use to demonstrate common practice.	
65	Arva Intelligence	The data requested does not pose too high a barrier for adoption. However, we have concerns regarding the 20% threshold of adoption, as this limits the long term improved practice adoption, and instead we advocate for an approach based on causality.	See first row of this table.
66	TotalEnergies Nature Based Solutions	The options listed seem sufficiently broad and flexible to fulfil this requirement	See first row of this table.
67	VGS	There's a good chance you might face difficulties gathering data for the demonstration of common practice (Section 7, Step 3). Here's why: **Lack of Clarity on "Common Practice": "Common practice" can be subjective. What's considered common in one geographical regions for example between in India and Philippines the common practices are different for paddy production and even within in India the practices are different from state to state in paddy cultivation and production. The guidance in Section 7**	See first row of this table.

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		might need more specifics on defining "common practice" for proposed methodology. . Data Availability: Finding relevant data on common practices can be tricky. Internal resources like project reports or competitor analysis might be helpful, but external data might be difficult. **The guidance could suggest resources for finding relevant paddy project reports, case studies, or benchmarks if any could helps developer to follow same..** Data Quality: Even if you find data, its quality can vary. The guidance could suggest ways to assess data reliability, like checking the source's credibility or looking for data from multiple sources. **Here's how the proposed guidance could be improved:** Clarify "Common Practice": Provide examples or references for what "common practice" means in the context of your project. This helps ensure everyone understands the expected data. Suggest Data Sources: List potential sources for finding more relevant data on common practices, including internal resources, research reports, and online databases.	

Q4: As a project developer, do you expect to have difficulties gathering the required data for the demonstration of common practice (Section 7, Step 3)? In what way could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		Guide on Data Quality: Offer tips on assessing data quality, like source credibility, data collection methods, and sample size. Alternatives for Missing Data: If specific data on common practices is unavailable, suggest alternative approaches like using expert opinions, conducting surveys within your industry, or estimating based on related information. By incorporating these improvements, the guidance in Section 7 can better equip you to gather the necessary data and ensure a strong demonstration of common practice in your project.	

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
68-76	[redacted]	[redacted]	**The following response addresses comments 68 - 76:** Thanks for the feedback. The methodology has been revised as follows: 1. Updates in subsection 8.3.1 including removal of the former Table 5 and new guidance establishing the emission factor (EFeu,r) concerning the off-farm end use; 2. Updates subsection 8.4 Leakage Emissions adding a list of the three potential leakages from VM0051 projects including the diversion of biomass residues for bioenergy applications; 3. Updates in subsection 8.4.3 clarifying that when implementing avoided burning, the competing applications of biomass residues may be forced to use input that are not carbon neutral and these leakage emissions must be determined following procedures in CDM TOOL16
68	Green Carbon, Inc	Straw can be used to make compost for plants or as a raw material for mushroom cultivation. Aerated manure with straw can reduce CH4 emissions by up to 90% compared to anaerobic storage (Petersen	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		et al. 2013). In a study in the Philippines, CH4 emissions from mushroom production were estimated to be only 73 g CH4 t−1 straw (dry weight) compared to the IPCC default emission factor of 4 kg CH4 t−1 for straw manure compost (Truc 2011). Arai et al. (2015) also found that the total GWP of straw mushroom cultivation is 12.5% lower than that of straw burning. However, these solutions (see Table 5, page 33) can be applied on a small scale but are difficult to implement on a large scale as the amounts of straw are very large. The use of microbial products that decompose the straw directly in the field and then mix the soil again is more practicable. These emissions and emission reductions are calculated by direct gas measurements in the field.	
69	Anonymous	Not to my knowledge.	See first row of this table.
70	NetZeroAg	Conceptually, the consideration of biomass end uses cannot be aligned with the given project boundaries limited to on-site emissions. This inherent expansion of the project boundaries has not properly been considered in the Guidelines. Instead, the guidelines treat these off-site emissions as a "black box", e.g. assuming that straw use of renewable fuel will have beneficial emission balance in any case and that those emissions can simply be ignored as	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		long they will not be claimed by the project. I have two concerns with this approach: (i) The underlying logic is only justifiable as long as there will be no carbon claims by the end-users of the straw which seems unlikely given the strong interest in carbon projects based on renewable energy or biochar. In the (probable) case of carbon claims by the end-user, the straw collection and transport entails a net-increase in GHG emissions. (ii) The cited publication on straw use as renewable energy source (Alengebawy et al. 2022) assumes straw baling as integral part of the post-harvest activities. At this point, however, straw baling cannot be deemed as the prevailing straw management practice in rice production and the GHG balance will be very different with a cumbersome mechanical collection of dispersed straw. Likewise, the consideration of emissions from straw use for erosion control seems simplistic as it ignores the distances of straw transport. In conclusion: The Guidelines should develop a holistic approach in combining the on-site and off-site activities under one MRV umbrella.	
71	AgriCapture, Inc	There are two factors the registry should consider when analysing emission from burning of rice straw. The first being that rice straw contains a large amount of silica,	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		thus is very heavy compared to other straws. This makes transport of rice straw unfeasible over about 5 miles of transport from the field to end-processing. The second factor is that burning rice straw reduces the amount of matter/fuel that is available for methanogens in the subsequent rice crop, drastically reducing the CH4 emissions. The peer-reviewed data says that emissions are further reduced by up to 30% when rice straw is burned vs left in the field or tilled into the ground immediately prior to planting. This is a major source of emissions and should be regarded as one of the most important problems to solve if a new model expected to increase accuracy over previous/other models.	
72	Indigo Ag	This question is a bit confusing,because Section 8.3.1 is not about leakage. This section is Project Emissions from Diversity Rice Straw to Alternative End-Uses. There is no table in the leakage section. However, we do have comments on Table 5: - The quantification related to animal feed points to VM42, but those sections of VM42 require data collection that would not be possible if the biomass were sold off as animal feed to a third party. For example, you need to know the livestock category,	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		population, fraction of manure managed on pasture, etc. It would make more sense to tie this quantification to the gross energy content of the biomass that was removed. There are other livestock quantification approaches that derive CH4 and N2O production from gross energy inputs. - The table states that avoiding post-harvest chopping and disking results in a net benefit of 11.63 kg CO2e/t straw. However, for animal bedding this is ignored while for use of rice straw as offsite erosion control it is included in the quantification. This is inconsistent. If the avoided emissions are not able to be counted for the former, they should also be excluded from the latter. - Please include references for all of the values used to derive the estimated emissions from offsite erosion control. For such an involved default factor, we would recommend pulling the full derivation, with citations, into a separate box that shows how you get to 93.01 kg/t. - It is not conservative to exclude the emissions from the production of biochar. If that biochar is used in a separate crediting program, then presumably those emissions are accounted, but there is zero guarantee that all biochar production would be	

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		captured in a crediting program with comprehensive accounting for project emissions.	
73	International Rice Research Institute	The title of Table 5 is misleading as it clearly indicates that one can account for a diversion from field incorporation which is in direct contradiction from number 8 of Applicability conditions "Practices that result in material declines in SOC or the carbon input rate to soils. For example, increased rice straw removal, decreased application of manure or compost, and introduction of new cultivars known to have a materially smaller root system than the cultivar(s) used in the baseline. Remove the "or field incorporation" in the title and reiterate again that these factors cannot be used for switching from straw incorporation to an alternative use for straw.	See first row of this table.
74	Grow Indigo Pvt Ltd	There is no guidance on accounting emissions for burning of rice straw other than Tier 2 approach currently in India. There are no standards or regulations for accounting these emission sources for diversion to bioenergy production, other than the CDM tool16.	See first row of this table.
75	Arva Intelligence	We have no specific recommendations for improvement.	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
76	VGS	Here are some ways the proposed method for assessing leakage emissions from avoided rice straw burning (Section 8.3.1, Table 5) could be improved: Increased Spatial and Temporal Resolution: Table 5 likely relies on average emission factors. Consider incorporating spatial data on rice production practices and local burning patterns. This would allow for a more nuanced assessment of leakage based on specific project locations. Similarly, factor in the time it takes for alternative management practices to become established, as emissions might differ in the initial stages compared to the long term because of the project activities. Monitoring Alternative Management Practices: The method should account for the emissions associated with the chosen alternative management practices for the rice straw. Life Cycle Assessments (LCA) of these practices could be incorporated to provide a more complete picture. Stakeholder Engagement: Involve local farmers and communities in the assessment process. Their knowledge of local practices and potential changes in land use due to the project can be	See first row of this table.

Q5: In what ways could the proposed method for assessing leakage emissions (Section 8.3.1, Table 5) associated with projects implementing avoided burning of rice straw be improved? Are there existing standards, regulations, or other sources that could provide guidance on better accounting for these emission sources, especially from the use of biomass feedstocks and renewable fuel production?			
#	Organization	Comment	Developer's Response
		invaluable however in India buring paddy straw is very common in some regions and by educating the farmers on the benefits of no buring , mulching back in the soil helps to adopt the change in land use and helps. Also rice straw is the main fodder for livestock on summer (dry fodder) and might be leakage emissions because of consumption of fodder could be accounted. **Improved Monitoring:** Satellite Imagery: Utilize satellite data to monitor changes in burning practices in nearby areas, potentially identifying leakage effects. Field Surveys: Conduct field surveys in surrounding regions to assess potential increases in burning due to the project. By incorporating these improvements and utilizing existing resources, the method for assessing leakage emissions can become more comprehensive and accurate, providing a clearer picture of the true environmental impact of avoided rice straw burning projects.	

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
77-90	[redacted]	[redacted]	**The following response addresses comments 77 - 90:** Thank you for your comment. Verra released an update in August 2023 to provide guidance for methodologies that include upstream displacement activities. These activities are defined as ""a project activity that reduces GHG emissions upstream of where the project activity is implemented, such as through product substitution, fuel switching, decreased demand for a given activity, product, or service, or other forms of displacement."" As part of this update, methodologies must provide evidence of one-to-one displacement between the downstream intervention and the upstream impact. Without this evidence, methodologies must provide an upstream displacement discount factor, based on peer-reviewed literature or a market analysis of supply and demand elasticities. Considering the complexities you raised related to fertilizer supply chains and the fact that this optional source of emission reductions represents a minor pool in the methodology, we have elected to remove this pathway. We appreciate your input. Please note the option to account for embedded emissions from fertilizer production has been removed from the methodology.
77	Regrow Ag	Partially, we have asked a question	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		regarding IF this emission source should be included in the SSR table in the following tab. Otherwise the description is clear.	
78	Green Carbon, Inc	Emission factor for embedded emissions associated with fertilizer production for synthetic fertilizer type SF (t CO2e/t fertilizer)". Is it possible to provide an emission factor for common fertilizers?	See first row of this table.
79	University of Uppsala	Having measured and studied both CH4 and N2O emissions from rice, I think this section should be made mandatory. N2O emissions could easily be higher than CH4 reductions if not managed well. This, accounting for it is crucial. While the extant literature on N2O emissions from rice is being strongly argued, it is sufficiently clear from data that N2O emissions are a significant trade-off of water management drainage events and ignoring this would mean, subsequently, when studies strengthen this point in the future, this methodology will fall short. Hence, I would strongly recommend making N2O accounting as well as claiming N2O reduction be made possible with this methodology.	See first row of this table.
80	Anonymous	There could be an integrated approach that allows for various practices to be included over a staggered period.	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
81	String Bio	While the language is clear, we propose a updating to the guidance that will help improve the accuracy and hep de-risk the overall methodology. The suggested change and rationale are listed below. **Current Clause** *8.3.3 Where projects materially reduce the total nitrogen applied to soils (see Section 8.2.4), project proponents may optionally choose to account for a reduction in emissions embedded in fertilizer production.* *Project proponents may estimate the emission reductions associated with upstream imbedded emissions using evidence including peer reviewed literature, government records, production facility records, survey data, publicly available LCA databases, or reports compiled by industry associations.* *Pursuant to Section 3.8.5 of the VCS Methodology Requirements, v4.4, project proponents* *must assess the rate of displacement using evidence including peer reviewed literature, government records, production facility records, survey data, or reports compiled by industry associations.* *Project proponents must use Equation (27) to calculate the reduction in embedded fertilizer emissions associated with the reduction in total fertilizers used by the project*	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		Feedback: 1. The methodology provides clear guidelines for calculating reduction in embedded fertilizer emissions associated with fertilizer use. However, given that the methodology enables the use of direct measurement for methane measurement, leveraging the same for nitrous oxide offset will allow for accurate nitrous oxide measurement. 2. For projects that will already be setting up direct measurement chambers and analysis, allowing for both methane and nitrous oxide to be measured using direct measurement enables for accurate quantification of GHG abatement. This can be done at marginal increase in cost - only additional cost being analysis cost of nitrous oxide. 3. Further, since the project supports water management practices (practices that could increase nitrous oxide emission) and use of methanotrophs (practices that can decrease nitrous oxide emissions), allowing for direct measurement for estimating nitrous oxide reduction can ensure robustness in the methodology.	
82	NetZeroAg	Yes	See first row of this table.
83	AgriCapture, Inc	The guidance is clear and reasonable.	See first row of this table.
84	The Nature Conservancy	The embedded emissions associated with reductions in fertilizer use should be	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		included, or at least specified, in the Project Boundary (Section 5, Table 2). Equation 27 could also be improved by further specifying how to calculate the term Nred_total using the same inputs used to calculate N2O emissions from N fertilizers in Section 8.2.4.	
85	Olam Agri Pte Ltd	It seems to reference "publicly available LCA databases", is this purposely written to exclude private databases that require a license to access?	See first row of this table.
86	Indigo Ag	Overall we think the guidance in Section 8.3.3 is reasonable. However, we are not sure how the 3rd paragraph relates to the approach, particularly the "rate of displacement". In Eq. 27, the first term (EF) is described by paragraph 2, and the second term (N_red) is the reduction in fertilizer use relative to the baseline. It seems like the third paragraph is intended to be related to the second term in Eq 27, but it's not clear if/how that relates to the rate of displacement or how peer reviewed literature or the other sources noted in paragraph 3 are relevant to the reduction in fertilizer relative to the baseline scenario. We would recommend either removing the third paragraph, or clarifying how it relates to either the first or second term in Eq. 27. Minor comments: It might help to write out "Life Cycle Analysis (LCA)" prior to the first	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		use of "LCA".	
87	International Rice Research Institute	yes	See first row of this table.
88	Grow Indigo Pvt Ltd	Equation 27 in 8.3.3 is clear; however, the Emission factor data for embedded emissions associated with fertilizer production for synthetic fertilizer type SF (t CO2e/t fertilizer) is difficult to get particularly in developing countries like India. Methodology could provide an acceptable range of emission factors at country level or regional level (Asia for eg) for commonly applied fertilizers Similar to Table 5 for wider acceptance by VVB and Verra reviewers. In the circumstances where the countries/PPs that have the access to such data should be allowed to use their own data points.	See first row of this table.
89	Arva Intelligence	We feel that the guidance is clear and reasonable.	See first row of this table.
90	VGS	Potential Improvements for the Guidance Here are some ways the guidance could be improved: Provide examples: Include real-world examples of how to apply the methodology for different fertilizer management practices.	See first row of this table.

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		Offer tools and templates: Develop online tools or templates to help project developers calculate and document emission reductions. Address data gaps: If specific data is difficult to obtain, suggest alternative methods or estimation techniques. Clarify baselines: Clearly define the baseline scenario against which emission reductions are measured. Consider regional variations: Account for potential differences in fertilizer practices and emission factors across regions. Additional Considerations Stakeholder feedback: Incorporating feedback from project developers, verification bodies, and other stakeholders can strengthen the guidance. Transparency: Ensure the methodology is transparent and allows for independent verification of emission reductions. Rigor vs. Feasibility: Balance the need for rigorous accounting with the practicality of implementation for projects. By addressing these aspects, the guidance	

Q6: With respect to the optional accounting for emissions from reductions in embedded fertilizer emissions, is the guidance in Section 8.3.3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		in Section 8.3.3 can become a more user-friendly and effective tool for accounting for reductions in embedded fertilizer emissions.	

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
91-100	[redacted]	[redacted]	**The following response addresses comments 91 - 100:** Thank you for your comment. Please note the option to use Surrogate modeling has been removed from the methodology.
91	Regrow Ag	Looks great	See first row of this table.
92	Green Carbon, Inc	It is clear	See first row of this table.
93	University of Uppsala	This is another welcome move and would help project developers. However, laying down minimum criteria and an established set of data needs for such emulators is crucial. These models are still evolving (I could be limited in gauging this) while stands an open field where any	See first row of this table.

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		oversimplified model can make way for the overestimation of fluxes. Some text with examples of such acceptable models and importantly, a minimum set of variables that should be part of such emulators needs to be mentioned.	
94	NetZeroAg	The guidelines should be sufficient flexible to allow a combination of approaches 1-3 (plus additional data, see below) within a Bayesian framework. Fitting models to data might result in better predictive performance. The practicality of that approach is another matter, but presumably there have been data collected over regions for several years.	See first row of this table.
95	AgriCapture, Inc	The guidance could be improved by providing examples of acceptable surrogate models, or at minimum, provide characteristics of models that the reserve would use to determine the appropriateness for use in a project.	See first row of this table.
96	The Nature Conservancy	It is not very clear what a surrogate process model is. The guidance could be improved by mentioning an example of such a model while also citing the recent research referenced in the first sentence of the Appendix.	See first row of this table.
97	Indigo Ag	The guidance in Appendix 3 may be overly restrictive in requiring the surrogate model to be trained with the output from a	See first row of this table.

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		process-based model. Statistical meta-analyses of published experiments are also a viable approach, and can be calibrated and validated using the same procedures laid out in VMD0053. Process-based models are evaluated on how accurately they predict field measurements, and statistical meta-analysis are directly built on published field measurements and can even be used to check the accuracy of process-based models. We would recommend revising the protocol to allow for any type of model that passes the validation criteria laid out in VMD0053, particularly statistical meta-analyses, including generalized linear mixed models (GLMMs).	
98	International Rice Research Institute	Step 2:The first option is to calibrate the process model prior to creating the Surrogate Process Model. Add to follow VM0053 for this calibration.	See first row of this table.
99	Grow Indigo Pvt Ltd	Guidance on developing surrogate process based models in appendix 3 is very vague and lacks definition and precision for developing such models for Carbon projects which are usually large-scale projects spreading across spatially distinct topographies, climates, soils, agroecological conditions and physical boundaries. While process based model	See first row of this table.

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		development itself has several limitations (for ex model has to be publicly available but cannot be employed for commercial purposes of carbon accounting by PPs) even after spanning over a 53 page long document as VMD0053, a one page appendix document for Surrogate process model development is inconceivably insufficient. The guidelines for process based models and for subsequent surrogate models need to be more clear and overarching considering the developing nation's conditions, where emission measurement data is not available for more than 80% of the geographies in a country. SOC data is highly variable and sensitive parameter in process based models and is particularly chaotic when modelling geographies that have inconsistent baselines or blended baselines with multicropping and multi regen practices in place with hundreds of cultivars in production. VMD0053 itself needs to be revised specific to reigons/continents/countries keeping in view the small holder farmer conditions and demand based cropping patterns. This will influence how surrogate models take shape under the guidelines of process based models.	
100	VGS	The clarity and reasonableness of the guidance on Surrogate Process Based Models (SPBMs) in Appendix 3 of ISO	See first row of this table.

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		26262 can be a topic of debate. Here's a breakdown of the arguments: **Arguments for Clear and Reasonable Guidance:** • Provides a framework: The appendix outlines steps for using SPBMs, including defining the scope, validation, and limitations. This offers a structured approach for companies considering this technique. • Raises awareness of limitations: The guidance emphasizes the importance of understanding the limitations of SPBMs, like potential inaccuracies and the need for real-world validation. This helps prevent over-reliance on these models. **Arguments for Potential Improvement:** • Limited detail: The appendix might lack specific details on validation techniques or how to address specific limitations of SPBMs. This could leave room for misinterpretation by companies with less experience. • Emerging technology: SPBMs are a developing field. The guidance might not fully capture the latest advancements or best practices. Here are some ways the guidance could be	

Q7: With respect to the optional use of 'Surrogate Process Based Models', is the guidance in Appendix 3 clear and reasonable? In what ways could the proposed guidance be improved?			
#	Organization	Comment	Developer's Response
		improved: • More specific examples: Including examples of how SPBMs have been successfully applied in different scenarios could provide better clarity. • Guidance on validation techniques: Providing details on specific validation methods and tools could help companies ensure the robustness of their SPBMs. • Updates on advancements: Regularly reviewing and updating the appendix to reflect advancements in SPBM technology would keep the guidance relevant. Overall: The guidance in Appendix 3 offers a starting point for using SPBMs in the context of ISO 26262.	

GENERAL FEEDBACK

Section 1 - Sources

Section 1 - Sources			
#	Organization	Comment	Developer's Response
101	VGS	The tool for SOC & Agro-forestry to be included	Thanks for the comment. Agroforestry projects and projects seeking emission removals (i.e., increasing soil carbon stock) can use VM0042; VM0051 is not suitable for such project types.

Section 2 - Summary Description of the Methodology

Section 2 - Summary Description of the Methodology			
#	Organization	Comment	Developer's Response
102	Regrow Ag	This section states "Practices that are expected to result in material declines in soil organic carbon (SOC) are not eligible under this methodology". More clarity is required regarding the consequences of implementing practices expected to materially decline SOC. For example, if there is a decline in field biomass compared to the baseline during the monitoring period, does this field need to be excluded from the program, or should Quantification Approach 1 (QA1) be used to quantify the decline in SOC in the final	Thank you for your comment. Fields/farms that exhibit practices expected to result in material declines in SOC are not eligible under the methodology. The guidance has been updated accordingly; refer to item #7 in Section 4 Applicability Conditions.

Section 2 - Summary Description of the Methodology			
#	Organization	Comment	Developer's Response
		outcomes?	
103	University of Uppsala	A major limitation of this draft is that N2O quantification is not included in Approach 2. It is important to include N2O emission monitoring in quantification approach 2 mainly because, even for the most developed countries, and the extant biogeochemical cycle models, these are still quite coarsely calibrated and might risk serious over or underestimation of N2O efflux contribution. Thus, leading to the creation of artificial emission reduction. This is crucial considering why the previous methodologies from different registries/bodies were found to be insensitive to or problematic and were then discarded. This point could just be the most critical aspect where this draft could fall short of being a better methodology. Section 8.5.2 gives the impression that N2O fluxes are to be measured - which would be ideal. Furthermore, while project developers using the quantification approach, the cost involved, and efforts involved in incorporating N2O measurement would be a small increment for a major uncertainty reduction in the emission reduction as compared to procuring gas chromatographs for just CH4 measurements.	Thank you for the feedback. Based on external expert consultations, field measurements are very complex and costly due to the spatial and temporal variability of N2O fluxes. Therefore, the methodology conservatively does not allow those measurements since it remains cost-prohibit and a simpler measurement approach could result in under- or over-estimations of emission reductions.
104	University of Uppsala	Another minor point and pedantic comment is on the use of the word 'material'	Thank you for the feedback. The methodology has been revised by the Verra Editorial team and updated

Section 2 - Summary Description of the Methodology			
#	Organization	Comment	Developer's Response
		throughout the draft. The word is used a bit too many times in the document as an adjective to possibly infer a physical reduction of sorts. In some cases, this could lead to misinterpretation. It is advisable to use the quantitative term, specific nouns or verbs in these places to be clear.	following the VCS writing style.
105	Ostrom Climate Solutions	Direct measurement should be allowed for N2O emissions too. Emission factors have high uncertainties, and it could be costly for projects to use biogeochemical modelling for N2O and chamber measurements for CH4. Based on expert opinion direct measurements are generally preferred. (see above comments)	Thank you for the feedback. Based on external expert consultations, field measurements are very complex and costly due to the spatial and temporal variability of N2O fluxes. Therefore, the methodology conservatively does not allow those measurements since it remains cost-prohibit and a simpler measurement approach could result in under- or over-estimations of emission reductions.
106	Regrow Ag	This section states "The baseline scenario assumes continuously flooded rice paddies and the continuation of historical rice cultivation practices." Does this mean that all projects will have continuously flooded fields as the irrigation baselines, or is this assumption made only when baseline data is not available or cannot meet the criteria specified in BOX 1?	Thank you for your comment. This is a simple summary section, and is not intended to replace the detailed guidance throughout the methodology that prescribes that accurate baseline data is needed on irrigation practices. Please refer to Section 6 of VM0051, v1.0 for detailed guidance on baseline assessment.
107	Regrow Ag	This section states "Any quantitative adjustment in optional further practices (e.g., decrease in fertilizer application rate and/or fossil fuel use) must exceed 5% of the pre-existing value to qualify as a practice change.". We propose an additional requirement to address date-	Thank you for your suggestion. Note that this methodology defers to detailed guidance in VM0042 and VMD0053 on the matter. Specific adjustments due to project conditions must be assessed by a VVB.

Section 2 - Summary Description of the Methodology			
#	Organization	Comment	Developer's Response
		based values. From our experience with smallholder farmer programs, we found that activities such as harvest, tillage, or fertilizer application can be conducted over multiple days for the same field. Therefore, we propose allowing the use of median date values as the date used for model parameters when an activity is conducted consistently within a field over multiple days.	

Section 3 - Definitions

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
108	Regrow Ag	This section states, AWD to be defined as "A system of cultivating irrigated lowland rice using controlled and intermittent irrigation. This water management technique uses much less water than the usual system of maintaining continuous standing water in the crop field. A periodic drying and re-flooding irrigation schedule is followed in which fields are allowed to dry to up to 15 cm below the soil surface before re-irrigation, without stressing the plants.".	The definition section is not intended to provide prescriptive guidance regarding data requirements. Data requirements are found elsewhere in the methodology, including detailed guidance in Section 9, Monitoring of VM0051, v1.0.

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
		Collecting evidence on AWD technicalities and timings can be a major effort in the context of smallholder farmer projects. Are there specific requirements for documenting this level of depth and timing data if it does not contribute to quantification (i.e., model inputs), or is this up to the Validation and Verification Body (VVB)? If this level of data is mandatory, can evidence of training and technical support requirements described in the Monitoring section suffice to meet this requirement?	
109	Anonymous	The methodology requires projects to measure and ensure drainage level must reach -15cm below the soil surface. The methodology is not clear on how this -15cm element should be monitored, reported or verified.	The definition section is not intended to provide prescriptive guidance regarding data requirements. Data requirements are found elsewhere in the methodology, including detailed guidance in Section 9, Monitoring of VM0051, v1.0.
110	Green Carbon, Inc	Regarding Alternate Wetting and Drying (AWD), it is stated that 'the water level must reach -15 cm below the soil surface during the entire drainage period.' However, in regions like Southeast Asia, it is difficult to reach -15 cm during the rainy season. Is this requirement mandatory for this project? If methane gas is measured directly, is monitoring the water level still mandatory? (-15 cm is optimal for the reduction of CH4. However, CH4 can be significantly reduced if the water is below the soil surface, even if it does not reach -	The definition section is not intended to provide prescriptive guidance regarding data requirements. Data requirements are found elsewhere in the methodology, including detailed guidance in Section 9, Monitoring of VM0051, v1.0.

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
		15 cm)	
111	CarbonFarm Technology	The ability for farmers to dry out their soil to a certain depth is a factor of multiple elements. While IRRI does promote 15cm drainages, in reality we have seen many smallholder farmers dry out their fields to the 10-13cm region. This is particularly true in the rainy season when drainages are possible but farmers have understandably less control over water levels. In some cases, we've seen such 10-13cm drainages correspond to 10 days of the soil being dry before the subsequent irrigation event. We would recommend to loosening the wording around AWD as to avoid discouraging or excluding such farmers.	The definition section is not intended to provide prescriptive guidance regarding data requirements. Data requirements are found elsewhere in the methodology, including detailed guidance in Section 9, Monitoring of VM0051, v1.0.
112	Olam Agri Pte Ltd	With respect to Definitions (Section 3), is the relevance of strata/stratum in the methodology significant enough to be included as a definition within the four corners of this document?	Thank you for your comment. Section 3 Definition was revised, and now it includes a definition for stratum.
113	Olam Agri Pte Ltd	With respect to Definitions (Section 3), The term : Quantification Unit" includes the term "Quantification Unit" within the definition. This seems confusing, sentence2 onwards appears to be meant to offer an illustration of the first sentence. Can that be more clear through the use of parentheses. Alternatively, can the procedure (sentence two onwards) be	Thank you for your comment. Section 3 Definition was revised, and now it includes a definition for quantification unit.

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
		described in (Section 5) instead?	
114	Indigo Ag	In the definition of AWD, we recommend revising "water level must reach -15 cm below the soil surface during the entire drainage period" to "the soil surface must be exposed and dry during the entire drainage period". Page 46 of the protocol cites the following document when specifying that the water level must fall approximately 15 cm below the surface during each dry down event: http://file-barisal.portal.gov.bd/uploads/84c360f5-ee48-46d2-b80b-71e9570f6dbe/61e/6fc/cfa/61e6fccfa64f0157141810.pdf. However, the cited document states that "When the water level has dropped to about 15 cm below the surface of the soil, irrigation should be applied to re-flood the field to a ponded water depth of about 5 cm." In other words, the cited document recommends initiating flooding as soon as the water level drops 15cm below the surface. This contradicts the definition of AWD on page 5-6, which requires the water level to be 15cm below the surface for the entirety of the dry down event. We believe the current definition of AWD on page 5-6 does not reflect the way that AWD is typically understood or implemented, and could potentially pose a risk to yield.	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage events has been replaced with the following: Each project must use persons with suitable qualifications and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers, the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their stratum. With respect to timing of when AWD events are to occur, it is recommended, but not required, that farmers undertake their first AWD drainage event at least 21 days after the initial flood, to ensure the pre-flood N application has time to be absorbed and is not washed away.

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
115	Indigo Ag	In the definition of AWD, we recommend specifying the number of dry-down days required to qualify. For example, "The soil surface must be exposed and dry for at least 4 days over the course of the growing season, not necessarily 4 consecutive days"	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage events has been replaced with the following: Each project must use persons with suitable qualifications and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers, the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their stratum. With respect to timing of when AWD events are to occur, it is recommended, but not required, that farmers undertake their first AWD drainage event at least 21 days after the initial flood, to ensure the pre-flood N application has time to be absorbed and is not washed away.
116	Indigo Ag	In the definition of AWD, we recommend specifying that the first dry-down event must occur at least 21 days after the initial flood to ensure the pre-flood N application has time to be absorbed and is not washed away.	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage events has been replaced with the following: Each project must use persons with suitable qualifications and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers,

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
			the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their stratum. With respect to timing of when AWD events are to occur, it is recommended, but not required, that farmers undertake their first AWD drainage event at least 21 days after the initial flood, to ensure the pre-flood N application has time to be absorbed and is not washed away.
117	VGS	SRI-Sustainable Rice intensification need to be included	Thank you for the feedback. Please refer to section 4 of the methodology for the list of individual eligible project activities. Some SRIs may eventually be recognized as eligible project activities under the methodology.
118	AgriCapture, Inc	We believe the definition of cultivation period does not adequately consider the use of direct seeded rice, in a dry environment. As such, this period is being improperly used in baseline and project emission calculations. The methodology's current definition of cultivation period is " the period of time that begins with pre-planting field preparation on rice paddies and ends at the harvest event." This period is expressed as a number of days in equation 20. As such, in the current	Thanks for the feedback. The definition of 'cultivation period' and equations have been revised accordingly.

Section 3 - Definitions			
#	Organization	Comment	Developer's Response
		calculation of baseline and project emissions, there can be a portion of the cultivation period where fields are not yet flooded. Methane will only be emitted once fields have been flooded. In the Southeast United States, a majority of farmers practice direct seeding in dry fields. We believe the period used "cultivation period" used in the methane emissions calculation should only reflect the period from which fields are flooded to harvest.	

Section 4 - Applicability Conditions

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
119	Mantle Labs	Point 4 states that the project must be equipped with controlled irrigation and drainage facilities unless the practice employed to reduce CH4 emissions does not require irrigation changes (i.e., through the use of methanotrophs). Since methanotrophs can reduce CH4 emissions without changing the water management regime, why is the introduction of methanotrophs not included as a main project activity in point 1 of page 8.	Thank you for your comment. The methodology's guidance has been updated to make it clear that changes in irrigation management are required. Implementing the use of methanotrophs is an eligible project activity that is also an "optional project activity."

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
120	Hexa Climate Solutions Pvt. Ltd.	The section describes that this methodology is not applicable if Rice is grown under upland, rainfed, or deep-water rice production techniques. There should be a clarification made for cases where one season is rainfed while other(s) is/are controlled irrigation. In such cases, this methodology should be allowed to be used for cases where the irrigation is predominately controlled. Excluding cases where one season has controlled irrigation while the other(s) is/are rainfed will exclude most of the potential projects from getting developed under this methodology	Thank you for the feedback. The guidance in Section 4 and the definitions of project activities (Section 3) have been revised and updated accordingly.
121	Regrow Ag	Similar to row 8 this section states, "8) Practices that result in material declines in SOC or the carbon input rate to soils. For example, increased rice straw removal, decreased application of manure or compost, and introduction of new cultivars known to have a materially smaller root system than the cultivar(s) used in the baseline." More clarity is required regarding the consequences for fields that implement activities expected to cause SOC declines, such as residue removal (where more than a certain percentage of residue is removed or burnt compared to the baseline). Does this make the field ineligible and therefore should be removed from the program, or	Thank you for your comment. Fields/farms that exhibit practices expected to result in material declines in SOC are not eligible under the methodology. There is no quantification, reporting, or crediting for SOC under this methodology, so such fields/farms cannot be part of projects developed under this methodology. For more details, see the guidance in Section 4 Applicability Conditions of VM0051, v1.0.

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
		does the biomass loss need to be accounted for in outcomes (using QA1)?	
122	Regrow Ag	This section states "10) Projects change off-season (i.e., outside of the cultivation period) management practices (e.g., crop rotations, crop types, and/or livestock management must not deviate from historical off-season management practices)." If projects change off-season management practices due to reasons outside of project implementation (e.g., financial, business), what are the consequences of this? Does this affect the project's eligibility, or are there specific guidelines for how such changes should be handled within the program?	Thank you for your comment. Fields/farms that significantly change their non-rice season practices in ways that are reasonably expected to alter the GHG flux during the rice season, will not be eligible under this methodology. Such fields could be included in a project utilizing VM0042.
123	Anonymous	Like Gold Standard methodology, the methodology assumes a baseline of continuously flooded. This seems a missed opportunity to have a more dynamic baseline scenario. For example, there is still a significant methane mitigation potential for moving from single flooded to AWD. Furthermore, some farmers may do a single drainage ahead of seasonal rains.	Thank you for the feedback. The guidance for baseline assessment has been revised, and it does adopt a dynamic baseline scenario; refer to Section 6.
124	Anonymous	We feel that Applicability Condition 10 is too constrictive. It constrains any non-rice diversification away from the historical off-season practices e.g. prevents farmers changing crop rotations, crop types and livestock management for the whole crediting period. Farmers should be able to	Thank you for your comment. Please note that those project types you mentioned could be eligible under VM0042 if they meet its requirements.

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
		respond to market signals (and environmental ones) that change and diversify farming systems, and ultimately improve livelihoods.	
125	Anonymous	Point (c) "Use of dry-cultivated water-saving and drought-resistance rice (D-WDR)". Do you like to mention "Aerobic Rice" as the novel cultivation practice? The dry cultivated system also refers to "Upland rice". However, "Upland rice" is not applicable in this methodology. Can you please specify the applicability of "Use of dry-cultivated water-saving and drought-resistance rice (D-WDR)"?	Thank you for your comment. Please note that D-WDR has been removed as an eligible activity under this methodology.
126	University of Uppsala	In the monitoring plan, it would be important to include minimum requirements/guidelines for proving no change in soil organic carbon.	Thanks for the feedback. The methodology has safeguards to prevent the implementation of project activities that could result in SOC declines, which refers to Section 4 Applicability Conditions.
127	String Bio	Current Clause Point 1) Projects must implement improved irrigation management practices that result in CH4 emission reductions from methanogenesis (i.e., "main project activities"), including at least one of the following: AWD, DSR, D-WDR. Point 4)The project rice fields are equipped with controlled irrigation and drainage facilities such that appropriate dry/flooded conditions can be established during both dry and wet seasons (unless the practice	Thank you for your comment. The guidance in Section 4 Applicability Conditions has been updated to make it clear that methanotrophs ('optional project practices') are only eligible when employed in addition to one of the 'main project activities', AWD or DSR.

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
		employed to reduce CH4 emissions does not require irrigation changes (i.e., through the use of methanotrophs). Feedback with Justification The language in the methodology (as highlighted above) is ambiguous to determine if the projects can be implemented without irrigation changes. Given that use of methanotrophs can abate significant amount of methane similar to adoption of other irrigation management practices like AWD, DSR and D-WDR it would be beneficial to enable the independent use of methanotrophs also as main project activities than as a "Additionality". Furthermore, methanotrophs can also abate ~50% of nitrous oxide which is not achievable with irrigation management practices alone. The Methanotroph use leads physiological changes in the rice crop due to improved photosynthetic efficiency. These physiological changes like leaf greenness and nitrogen fixation can be monitored via remote sensing technologies which promotes effective monitoring of project fields. With respect to water consumption concerns, methanotrophs can be applied with reduced water intake (for eg: flooded	

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
		up to 5 com) without compromising the yield to the farmer. Therefore, the methodologies should consider the practices outside of the irrigation management such as methanotrophs use also as main project activities.	
128	String Bio	Current Clause 1) Projects must implement improved irrigation management practices that result in CH4 emission reductions from methanogenesis (i.e., "main project activities"), including at least one of the following: AWD, DSR, D-WDR. Feedback The above applicability condition restricts the use of the methodology only for projects with change in water management practices. This is a significant restriction for some of the additional practices, such as using methanotrophs, that have been documented to benefit carbon abatement (through methane and nitrous oxide reduction), farmer welfare (yield and quality improvement) and scalability (ease of adoption). Some of the key challenges with the Applicability Conditions and the suggested improvements that can enhance	Thank you for your comment. The guidance in Section 4 Applicability Conditions has been updated to make it clear that methanotrophs ('optional project practices') are only eligible when employed in addition to one of the 'main project activities', AWD or DSR.

Section 4 - Applicability Conditions			
#	Organization	Comment	Developer's Response
		Methodology robustness are listed below. A. Methanotrophs have been demonstrated to be extremely effective in GHG emissions reduction (up to 50% reduction of methane and up to 40% reduction of nitrous oxide) without irrigation changes and can unlock significant carbon abatement value. For example, for global annual average emissions of methane is 283 kg/ha/season (= 7924CO2e Kg/ha) use of methanotroph can offset ~141.5 kg/ha (=3962 Kg CO2e/ha). Similarly, global annual average emission of N2O is 1.7kg/ha/season (448 kg CO2 e/ha) and use of methanotrophs can offset up to 0.68kg/ha (179 kg CO2 e/ha). Water management practices while reducing methane, typically, increase nitrous oxide output. Nitrous oxide is a more potent GHG than methane, even if the net amount released is small. (Please see details listed in Miranda et al, 2015(http://dx.doi.org/10.1007/s11104-013-1878-7), Chaudary et al, 2023 (https://doi.org/10.1007/s43615-022-00173-x) for references on the increased release of nitrous oxide related to changes in water management practices in paddy) Hence, use of methanotrophs as an additionality to water management limits the optimal use of an efficient carbon abatement solution that abates two potent	

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		GHGs from rice cultivation. B. Methanotrophs have also been clearly demonstrated to increase the yield output for the farmer (between 10-40%) without any change in regular crop management practices. On the other hand, irrigation change based project activities require high level of water/weed management (for eg: use of herbicides, additional drainage facility) to achieve similar yield output. Yield declines if drainage levels go beyond 15 cm "safe AWD" (Info Note, IRRI &CGIAR. 2014) and if weeds are not controlled in DSR, yield losses could exceed 90% (Ahmed et al. 2014). If methanotrophs are only considered additional to water management practices, we are limiting the optimal use of a carbon abatement solution that can also inherently increase the yield for the farmer. C. One of the significant advantages with the use of methanotrophs as carbon abatement solution is the ease of adoption. Methanotroph application is a simple soil or foliar spray that the farmer needs to implement to be able to achieve the carbon abatement from rice. Given that the farmer typically does other sprays during the crop lifecycle, they have access to the equipment for implementing methanotroph based solution.	

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		On the other end, the challenges with scaling of AWD or DSR is the significant support the farmer would need with training and implementation of the methodology. According to the note published by International Institute of Rice research (IRRI) & CGIAR (2014) to implement AWD, local farmers must be willing to deviate from traditional practices and have access to support from local government and water management officials. Proper levelling of rice fields is necessary to ensure that no areas are excessively dry or wet, which could adversely affect yields. Laser land levelling may be required in some farming systems, and this could add to the cost for the farmers. D. The use of methanotrophs for GHG reduction has additional benefits in the rice value chain for the farmer, environment, industry and the project developers as follows: 1. Improved grain quality (more head rice, less broken, ~10% increase in Zinc & Iron) 2. Better nutrient use efficiency with simultaneous reduction in fertilizer use 3. Better soil health and long-term fertility (Reduced synthetic fertilizer usage and improved utilization of macronutrients) 4. High accessibility and adaptation due to	

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		low-cost technology 5. Project deployment becomes scalable with faster adoption rate	
129	String Bio	Current Clause This methodology is not applicable for Rice is grown under upland, rainfed, or deep-water rice production techniques. Feedback Exclusion of upland, rainfed, or deep-water rice production from the methodology excludes a huge area of rice cultivation (fao.org: rainfed lowland = 44-46 mil ha, rainfed upland = 15-16 mil ha, deepwater = 3-4 mil ha, Total = 66 mil ha) from using GHG abatement technologies. Major upland rice areas are in Asia (8.9 mil ha) followed by Africa (3 mil ha) and Latin America (3.1 mil ha) (Pathak 2018-icar.gov.in).Top rice-producing countries in Asia include China, India, Indonesia, Bangladesh, Vietnam, Thailand. India having highest area under rice cultivation and of which 40% is rainfed (NRRI Research Bulletin 22.(icar-nrri.in). This exclusion will significantly reduce the percentage of rice farmlands (in India and Asia) that will be able to leverage carbon credits to adopt sustainable rice technologies.	Thanks for the feedback. Projects under upland, rainfed, or deep-water rice production techniques can use VM0042.

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		Today, solutions like methanotrophs can deliver GHG abatement in all above-mentioned conditions (upland, rainfed, or deep-water rice cultivations) which are characterized by uncertain water levels but account for long term methane emissions. By limiting the use of methodology for such practices, we are reducing the total valid area for carbon offset from Rice Cultivation. This restricts the access to carbon markets for large pool of rice farmers and limiting the total CO2e abatement potential of rice fields towards climate goals like Global Methane Pledge (30 MMT CH4 from rice cultivation). By using direct quantification approach with application of methanotrophs, substantial emission reduction would be achieved and accurately measured.	
130	NetZeroAg	There should be better alignment between the mitigation technologies listed on p. 8 and the "sources" (2nd column) given in table 4.	Thanks for the feedback. The methodology has been revised accordingly.
131	NetZeroAg	I never heard before that rice has woody biomass. Since this should be ignored in the procedure anyway, I found this statement more confusing than helpful.	Thank you for your comment. Rice does not have woody biomass. The intent is to make sure projects don't remove too many trees/shrubs etc from their farms, as that might undermine the positive GHG impacts of the project. Nonetheless, the term "woody biomass" has been removed to avoid confusion.
132	AgriCapture, Inc	We believe 'furrow irrigation or cultivation of row rice' should be considered a "main	Thank you for your comment. Furrow irrigated/row rice has been moved to the 'main project activities' list.

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		project activity" rather than an "optional activity." In our work located in the Southeast United States, we've seen over a 40% decrease in CH4 emissions through the implementation of furrow irrigation compared to conventional flooding. In this region, farmers face significant barriers to adoption, including capital intensive field levelling and social and cultural traditions. This practice should be viewed similarly as alternative wetting and drying.	Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
133	RiceTec	The three irrigation practices (AWD, DSR, D-WRD) are proven to reduce methane and it is good they are included	Thanks for the feedback.
134	RiceTec	Inclusion of DSR is a very important way to reduce methane emissions in rice, especially in growing regions historically reliant on transplanted and continuously flooded rice. However, differentiation should be made between dry seeding on dry soil and pregermination on wet soil since the methane emissions are different	Thank you for your comment. Section 3- Definition was revised, and the definition for DSR was updated accordingly.
135	RiceTec	Option to include furrow irrigation or row rice enables farmers in rice growing regions already using DSR to further reduce methane emissions	Thank you for your comment. Furrow irrigated/row rice has been moved to the 'main project activities' list. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
136	RiceTec	Increase the soil organic carbon and/or reduce net CH4 emissions by utilizing	Thank you for your comment. The guidance in Section 4 regarding applicability conditions for new cultivars has

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		specific environmentally friendly cultivars (see row 15 for more details of proposal)	been updated as follows: "Introduction of short-duration or low-emission rice cultivars where project proponents ensure no material changes in carbon inputs to the system through root biomass..."
137	CarbonFarm Technology	The use of methanotrophs seems like an appealing solution to further reduce methane emissions from rice paddies. We are concerned, however, about the strength of this option in this methodology. We consider improved irrigation practices to be by-and-large observable and verifiable via the means outlined in the monitoring section of the draft methodology, both in the context of smallholders and larger, industrial farms. On the contrary, we are concerned that, most particularly working with smallholders, the methodology does not provide sufficient safety measures and guidance to apply the same level of monitoring rigour for methanotrophs. Simply put, beyond self reporting, we fail to see what measures exist to monitor which farmers have applied methanotrophs, to what extent, and whether application procedures have been correctly followed. We find this particularly problematic as the impact of methanotrophs and improved irrigation practices must be measured together. If one of the two practices cannot be rigorously monitored, it is the joint emission reduction that will come under	Thank you for your comment. The data we reviewed in considering methanotrophs indicate expected benefits of their use include significant reductions in CH4. It should also be noted that there is a significant cost associated with the use of methanotrophs, which can be documented. It should further be noted that the majority of projects using this methodology are likely to involve impoverished smallholder farmers in rural areas, meaning the use of various means of self-reporting is likely to remain critical, although the use of DMRV, where suitable, may also be feasible. Please note the methodology has been updated to require QA2 flux chamber measurements when methanotrophs are used, as well as baseline control site measurements for credible quantification of emissions reductions.

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		scrutiny. We see parallels between the use of methanotrophs and the use of feed ingredients to reduce enteric methane (VM0041). VM0041 sets out clear recommendations for both measurement and monitoring for feed ingredients, making it clear to buyers what credits they are acquiring. In this light, we would see favourably the introduction specific guidelines and safety guards for projects using methanotrophs.	
138	CarbonFarm Technology	When avoiding straw residue burning, we are concerned as to how the market would evaluate the risk of over crediting due to leakage. The impact of out-of-field use of straw is so significant that it can make the difference between a net positive or net negative carbon project. Furthermore, it is particularly difficult to monitor the use of unburned straw in a smallholder context. As an example, we can compare the use of straw for animal bedding vs. animal feed. The two options have significantly different emission profiles - straw as (a low-quality) animal feed to ruminants will lead to much greater emissions than straw burning. However, monitoring that farmers use their straw for one and not the other seems difficult if not impossible. As such, we wonder if, unfortunately, avoided residue burning presents greater	Thank you for your comment. Please see the analysis of GHG flux associated with straw end-use summarized in Table 5. In terms of monitoring, the flexible data sourcing options (including, in particular, those summarized in Box 1) are aimed at alleviating challenges in data capture. Yet, as per methodology guidance, a PP must provide sufficient evidence ensuring no leakage related.

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		risk than it does opportunity, introducing a significant risk of over crediting that may ultimately harm the market's willingness to purchase credits.	
139	CarbonFarm Technology	Point 10 in the applicability section seems to exclude farmers that change their off-season practices. We are concerned by this point for two reasons. Firstly, we would expert farmers to naturally rotate and evolve their off-season practices over time. This is an expected part of life for smallholders that are growing multiple crops every year and it seems like an unintentional consequence to exclude farmers that follow this very nature cycle. Secondly, collecting data about off-season practices may be very costly. While some off-season practices will impact on-season emissions, we would expect this to be reflected in the stratification (e.g. pre-season water regime). For the vast majority of off-season practices farmers change will not impact the stratification, the exclusion criteria seems inappropriate. As such, we would recommend that the off-season exclusion criteria be replaced. We would instead recommend a requirement that the baseline and project stratification be updated in years when the off-season practices deviate from the previous set of	Thank you for your comment. Fields/farms that significantly change their non-rice season practices are not eligible under this methodology. Project with such setup could use VM0042.

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		stratification variable values listed in table 3.	
140	The Nature Conservancy	We recommend clarifying in this methodology whether the application of biochar is an acceptable additional activity and if/how this methodology would overlap with VM0044. We would support the inclusion of biochar as an additional activity not for any gains in SOC stocks (which could be conservatively excluded given the broader focus of this methodology) but for further reductions in methane production due to its adsoprtion of dissolved organic carbon and its creation of aerobic microenvironments in its porous structure (https://www.sciencedirect.com/science/article/abs/pii/S0929139322002013).	Thank you for your comment. The guidance in the methodology has been updated to make it clear that the application of biochar is eligible under this methodology, and that QA2 is necessary for all fields to which biochar is applied. The stratification guidance (now Table 4) has also been updated to include biochar as a mandatory requirement, where biochar is applied. Please also note that under VCS rules it is possible for a project to use multiple methodologies, and thus a project may also use VM0044 to be credited for emission reductions associated with the production of biochar. Projects must ensure they meet the requirements in Applicability Condition (8) with respect to not materially reducing the volume of biomass input to soils relative to baseline conditions.
141	The Nature Conservancy	We recommend clarifying in Bullet 8 that baseline scenarios where rice straw is burned in the field do not represent carbon inputs to soils for purposes of quantifying "material declines in carbon input rate to soils".	Thanks for the feedback. We revise the guidance in section 4 and throughout the methodology to clarify this issue regarding rice straw management and burning.
142	The Nature Conservancy	We recommend adding fertigation to the list of example improvements in nitrogen management in condition 2f.	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
143	Olam Agri Pte Ltd	4.7) "Native Ecosystem" should probably receive a definition	Thanks for the feedback. This definition is detailed at the program level and refers to the VCS Standard

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			documents.
144	Olam Agri Pte Ltd	With respect to Applicability Conditions (Section 4), "the project area has not been cleared of native ecosystems within the 10 years immediately preceding the project start date," Can a process for verification be offered as it may be difficult in some contexts to define the ecosystem (especially if it was a rainfed grass land where it served as expanded wetlands for some period per year)? This may be assuming forestry (which would have clearer guidelines) and not as clear in terms of grasslands or wetlands. Even mangrove areas (often left out of forestry definitions) would benefit from clarity	Thanks for the feedback. This definition is detailed at the program level and refers to the VCS Standard documents.
145	Olam Agri Pte Ltd	With respect to Applicability Conditions (Section 4), how is the differentiation of Nitrogen fertilizers (urea vs ammonia), practices of nitrogen fertilizer regimes (e.g. encapsulated, gas injection), or timing (basal application, split applications) being thought about? If these changes can produce a 5% impact would they be seen as equivalent to a fertilizer reduction?	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
146	Olam Agri Pte Ltd	With respect to (4) in Applicability Conditions (Section 4), "The project rice fields are equipped with controlled irrigation and drainage facilities such that appropriate dry/flooded conditions can be established during both dry and wet	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "main-" and "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.

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		seasons (unless the practice employed to reduce CH4 emissions does not require irrigation changes)" If fields are equipped with impermanent (e.g. portable pumps) solutions would this qualify? If so, is there a need for training on the use of these solutions? This mentions facilities, I may have missed it, but is there a precondition for age and working order of the infrastructure and minimum sloping of drainage?	
147	Olam Agri Pte Ltd	With respect to Applicability Conditions (Section 4), should the condition "the project activity does not lead to a decrease in rice yield" be added? Especially since this condition is mentioned in "Clean Development Mechanism (CDM) AMS-III.AU Methane Emission Reduction by Adjusting Water Management Practice in Rice Cultivation, v4.0," (2.2c) a methodology this methodology is based upon.	Thanks for the feedback. The assessment of yield follows the guidance in section 8.4, Leakage. Note that material yield declines are not permitted.
148	Olam Agri Pte Ltd	With respect to the practises (1) in Applicability Conditions (Section 4), is drip irrigation within this set of activities?	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
149	Olam Agri Pte Ltd	With respect to the practises (1) in Applicability Conditions (Section 4), is this list consistent with language being used within Asia and African countries that are seeking private sector support with NDC	Thank you for the feedback. VCS methodologies follow the VCS program definitions, which are generally aligned with international carbon market terminology.

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		execution?	
150	Indigo Ag	Furrow irrigation is currently listed as an optional project activity. However, furrow irrigation can lead to comparable reductions in methane emissions as AWD (and sometimes greater), so we suggest potentially moving it to the list of "main project activities". For studies of CH4 emissions from furrow irrigated fields, please see: Della Lunga, D., Brye, K. R., Slayden, J. M., Henry, C. G., and Wood, L. S. (2021). Relationships among soil factors and greenhouse gas emissions from furrow-irrigated Rice in the mid-southern, USA. Geoderma Regional 24, e00365. doi: 10.1016/j.geodrs.2021.e00365. Karki, S., Adviento-Borbe, M. A. A., Massey, J. H., and Reba, M. L. (2021). Assessing Seasonal Methane and Nitrous Oxide Emissions from Furrow-Irrigated Rice with Cover Crops. Agriculture 11, 261. doi: 10.3390/agriculture11030261. Slayden, J. M., Brye, K. R., Lunga, D. D., Henry, C. G., Wood, L. S., and Lessner, D. J. (2022). Site position and tillage treatment effects on nitrous oxide emissions from furrow-irrigated rice on a silt-loam Alfisol in the Mid-south, USA. Geoderma Regional 28, e00491. doi:	Thank you for your comment. Furrow irrigated/row rice has been moved to the 'main project activities' list. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.

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		10.1016/j.geodrs.2022.e00491.	
151	Indigo Ag	Applicability condition 8 specifically excludes "Practices that result in material declines in SOC or the carbon input rate to soils." A few examples are provided. How are VVBs meant to assess other practices (or combinations of practices) that may result in "material declines" to SOC if they are not one of the listed examples? Does the project proponent need to justify the totality of the management regime? How is materiality defined in this context? What about crop rotations? What if management in non-rice seasons are leading to SOC losses?	Thank you for your comment. Fields/farms that exhibit practices expected to result in material declines in SOC are not eligible under the methodology. The guidance has been updated accordingly; refer to items #7, 9 in Section 4 Applicability Conditions.
152	Indigo Ag	It might help to explicitly state that a field is only eligible if continuous flooding was used in all baseline years in which rice was planted (if that is the intent).	Thanks for the feedback. The guidance for the baseline scenario has been revised accordingly, according to Section 6.
153	Indigo Ag	The footnote for condition 2.b seems to be referring to condition 2.a rather than condition 2.b. Should the "2" superscript be removed from condition 2.b?	Thanks for the feedback. The methodology has been updated.
154	Indigo Ag	Condition 4 states that "The project rice fields are equipped with controlled irrigation and drainage facilities such that appropriate dry/flooded conditions can be established during both dry and wet seasons (unless the practice employed to reduce CH4 emissions does not require	Thanks for the feedback. The methodology has been revised accordingly.

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		irrigation changes (i.e., through the use of methanotrophs)." We propose removing the language "(unless the practice employed to reduce CH4 emissions does not require irrigation changes (i.e., through the use of methanotrophs)" because it seems to be an impossible situation due to condition 1. Condition 1 on page 8 states that "Projects must implement improved irrigation management practices that result in CH4 emission reductions from methanogenesis." Consequently, it seems impossible for a field to qualify if no irrigation changes are made to reduce CH4 emissions.	
155	International Rice Research Institute	There should be better alignment between the mitigation technologies from page 8 and the sources given in table 4.	Thanks for the feedback. The methodology has been revised accordingly.
156	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Suggest deleting 2a "use of methanotrophs"	Thanks for the feedback. The methodology has been revised accordingly.
157	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	section 4. end sentence after "wet seasons".	Thanks for the feedback. The methodology has been revised accordingly.
158	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Insert new section 5. with text " If the practice employed to reduce CH4 emissions consists solely of the application of methanotrophs then conditions 1) and 3) above is not required to be met (the project can be developed solely for the purpose of application of methotrophs). Condiser including footer from page 8. into section.	Thanks for the feedback. The methodology has been revised accordingly.

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159	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	The current language in condition 4) is contradictory as it suggests that the use of methanotrophs (which is an additional project category under 2) above) can be undertaken without condition 3) which is applicable for main project categories in 1) above. Therefore it would seem logical to carve out the use of methanotrophs as a separate stand-alone project category that (supported by current language) can be implemented without any of the actions in 1) above.	Thanks for the feedback. The methodology has been revised accordingly.
160	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	The carve out of use of methanothropes should be endorsed by the methodology to enable significant methane reducing microbial interventions where the reduction of methane is independent of AWD, DSR and D-WDR. Tying this project category (as is currently done by making 2a conditional on 1)) limits the usability of the methodology for a key mitigation solution for the sector and it also limits the available acreage for mitigation activities. The purpose of the methodology revision should be to ensure there is sufficient foresight built into the applicability conditions to ensure new mitigation solutions can benefit from the methodology, without conditioning it on other field management practices. AWD acres are globally ~50% at best and e.g. in India only ~15%.Current approach leaves all the flooded acres outside of the scope	Thanks for the feedback. Projects under upland, rainfed, or deep-water rice production techniques can use VM0042.

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		of the protocol. Many of these flooded acres are from natural rainfall. There are a significant number of growers in naturally flooded acres that will not be able to take advantage of the protocol with the use of methanotrophs in the way the methodology is currently written.	
161	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Consider clear definition of "materiality" in 8)	Thanks for the feedback. The methodology has been revised accordingly.
162	Grow Indigo Pvt Ltd	Will Verra Rice methodology be able to accommodate multiple cropping systems with rice (rice-wheat, rice-maize etc), or will it only be specific to rice? Can we apply vm0042 for rice-other crop systems and rice methodology for rice-rice systems especially if both systems co exist in a single project. Meaning can we follow two methodologies for one project i.e. stacking of 2 methodologies allowed?	Thanks for the feedback. Projects implementing such project activities can use VM0042. Also, VM0042 is undergoing a major review that includes additional guidance related to the rice project.
163	Grow Indigo Pvt Ltd	Provision to use any kind of biologicals that could contribute towards emission reductions and/or carbon sequestration as one of the practice.	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
164	Grow Indigo Pvt Ltd	The rice methodology creates categories of baseline and project practices focusing only on water management. This reduces the flexibility for project developers in introducing any other practice that is not related to water management specific to	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.

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		the region. For example, introducing biological products for reducing methane emissions in transplanted rice fields as a regenerative practice.	
165	Arva Intelligence	For the 'controlled irrigation and drainage facilities', some producers have one or the other, but not both.	Thanks for the feedback.
166	Arva Intelligence	Greater flexibility on the applicable projects should be allowed to account for future practice improvements/innovations that reduce methane emissions.	Thanks for the feedback. Please refer to Section 4 for the list of eligible project activities. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
167	Stanford University	In point 2.a, the use of methanotrophs is listed as an additional activity to reduce methane emissions. Methanotrophs reduce methane levels by consuming methane. However, there are also microbes that reduce methane levels by minimizing the formation of methane (e.g., sulphate-reducing bacteria, cable bacteria, see e.g., https://doi.org/10.1038/s41467-022-29008-x). Therefore, replacing methanotrophs with a more general term, such as 'microbes that lead to a reduction of methane emissions,' would help broaden the application possibilities.	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.
168	Stanford University	Under points 2 and 3 (and in Table 2 in the section '5 Project Boundary'), two additional techniques could be incorporated: 1) The application of sulphate (e.g.,	Thank you for your comment. Please refer to Section 4 Applicability Conditions to confirm eligible "optional project activities" eligible under this methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.

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		https://doi.org/10.1023/A:1011380916490) to reduce methane emissions. 2) The replacement of lime with silicate rocks (e.g., https://doi.org/10.1007/s11104-024-06570-5) to go from carbon loss to carbon sequestration.	
169	VGS	2. g . Agroforestry system need to be included	Thanks for the comment. Agroforestry project could use VM0042.
170	VGS	point no.9 : Need to be excluded Rained because we are encouraged the farmers to go with AWD method or DSR and/or ridge and farrow irrigation for the water management and with the management, paddy growing under rained conditions need to be included in the proposed methodology	Thanks for the comment. Rain-fed rice fields/projects could use VM0042.
171	AgriCapture, Inc	We would like the registry to provide additional guidance on the earliest practice start date that can be submitted under this methodology the methodology is accepted in 2025, can project developers only submit practice changes that occur in 2025, or will there be a look back period?	Thanks for the feedback. The methodology required a minimum of three years historical look-back period, see section 6 for details.

Section 5 - Project Boundary

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172	Regrow Ag	Please confirm the embedded fertiliser emission can be accounted for in outcomes, even though not included in SSRs presented in table 2	Considering the complexities related to fertilizer supply chains and the fact that this optional source of emission reductions represents a minor pool in the methodology, we have elected to remove this pathway.
173	NetZeroAg	The entire procedure of calculating N2O emissions does not give any notion on the enormous uncertainty in the IPCC emission factors. While the EFNdirect of continuous flooding is 0.003, the given range is 0.000-0.010. Likewise the range for single and multiple drainage (EFNdirect = 0.005) has a range of 0.000-0.016. I can see the rationale for the correction of N2O emission triggered by the shift in irrigation practice because almost all field measurements showed higher N2O emissions under AWD in relative terms. As far as the absolute emission factors are concerned, however, I feel that the uncertainties are too large for a calculation of direct N2O emissions. Given the complexity in understanding the concept and the equations of indirect N2O emissions – vis-à-vis the low amounts of CO2e involved -- I wonder if the methodology should simply consider them as "di minimis" as done for other emissions (e.g. from SOC changes). My suggestion would be that the N application rate has to be identical for both baseline and project scenario.	Thank you for your comment. Please note that the approach for estimating N2O emissions in this methodology follows industry best practices, including almost identical measures in VM0042, and methodologies developed under several other carbon programs. Under this methodology, the use of the Tier 1 IPCC emission factors is limited to small-scale projects. Please note that projects have the option to apply QA 1 (modelling) for N2O emissions.

Section 5 - Project Boundary			
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174	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Table 2, source "soil methanogensis": Add footnote saying "Where project activity involves solely the application of methanotrophs, methane reduction needs not to be associated with changes in anoxic conditions, but only with reduction in GHG from application of methanotrophs.	Thanks for the feedback. Note that methanotrophs are an 'optional project activity' that must be implemented in addition to at least one 'main project activity'; see section 4 for more detailed guidance.
175	Ostrom Climate Solutions	Perhaps clarify here that SOC will need to be modelled if using quantification approach 1 for quantification of other GHG pools of concern (e.g., CH4 or N2O)? This could be a source of confusion.	Thanks for the feedback. The methodology guidance has been revised accordingly.
176	VGS	The definition "The spatial extent of the project boundary is all lands on which the proposed rice cultivation activities will be implemented" need to be modify because in section 4, points no. 8, 9, 10 are talking about the limitations of the proposed proposal and statement is controversy	Thanks for the feedback. The methodology guidance has been revised accordingly.
177	VGS	Table 2 . Agroforestry need to be included as additional and/or optional project activities as one of the direct carbon pools	Thanks for the feedback. Agroforestry projects could use VM0042.

Section 6 - Baseline Scenario

Section 6 - Baseline Scenario			
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178	Mantle Labs	All the mandatory requirements solely stratify the area according to management practices and cultivation patterns. The literature on this subject, as well as Mantle Labs' simulations have shown that the CH4 emissions strongly depend on site-specific soil conditions such as SOC, pH, Soil texture (sand/clay %) which are only shown as 'optional' in this table. We believe these should be made mandatory in determining strata from which to take reference fields. Furthermore, remote sensing can also aid this stratification through the creation of digital soil maps.	Thank you for your comment. Indeed, it is recommended to include those parameters in project area stratification under any of the QAs whenever possible since it could help reduce data uncertainty and crediting discounts thereof, thus providing an incentive for projects to include such data. Also, please note soil texture has been added as an optional stratification criterion in Table 5.
179	Regrow Ag	This section states "The baseline scenario is the continuation of conventional flooded rice paddy cultivation practices. 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 a schedule of activities. The historical look-back period must be at least three years in duration. This same schedule of activities is then used to establish project emission reductions during each monitoring period". We support a minimum historical look-back period of 3 years.	Thank you for your comment. The methodology requires a minimum of 3 years for a historical look-back period.
180	Regrow Ag	This section states "In circumstances where climatic conditions result in a	Thank you for your comment. Please note the guidance around this issue has been updated in Section 6, as

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		monitoring period's cultivation season lasting longer than the baseline cultivation season, project proponents may set the baseline cultivation season duration using monitoring period data derived from baseline control sites. At least one baseline control site is required per stratum. The data (number of days in the cultivation season) must be derived from sources listed in Box 1, including those data retrieved from farmers surveys, and/or satellite images" From our understanding, if QA1 or QA3 are used, control sites are not required. Based on this, we propose when a monitoring period cultivation season duration is longer than the baseline cultivation season duration AND QA1 or QA3 is used to quantify outcomes, the baseline cultivation season can be defined using the monitoring data collected without the need for control sites, especially in each stratum. Therefore, we propose that control sites should not be mandatory when adjusting the baseline cultivation season using monitoring data.	follows: "...in circumstances where actual weather conditions during the monitoring period result in a cultivation period with a longer duration than the baseline scenario cultivation period (as derived from the schedule of activities), project proponents may set the baseline scenario cultivation period equal to the project scenario cultivation period for affected fields during the same season of the monitoring period. To qualify for this exception, project proponents must demonstrate that the duration of the project scenario cultivation period (from pre-planting to harvesting) is commensurate with non-project fields by using data from reference fields in the same region as the project area7 or providing other evidence following the data sourcing hierarchy in Box 1." By following this guidance, using regional data and/or reference fields, PPs must demonstrate that the change in cultivation season duration in the project scenario is indeed being caused by circumstances outside of their control, i.e., the weather, and it's not the implementation of project activities that's causing the change in cultivation season.
181	Anonymous	Projects must use water regime (on and off season), organic amendments, cultivation season duration and n-fertiliser application as mandatory stratification elements. Gold Standard has few mandatory strata (only water regime and organic amendments). This could lead to large numbers of strata, which could be cost-prohibitive for developing Tier 2 emission factors. In	Thank you for the feedback. The guidance for project stratification has been revised and updated based on PC feedback. Please refer to Appendix 1 and additional guidance through the methodology.

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		particular, the purpose of stratification is to define the number of direct measurements needed. As fertiliser does not significantly contribute to methane emissions, and the methodology permits emission factors for calculating N20 emissions from fertiliser, we believe fertiliser amount is not needed as a mandatory stratification. Instead, N20 emissions from fertiliser can be calculated basis per-field data captured from farmers, and the appropriate EF's can be used to calculate emissions. Thus fertiliser usage should be made an optional stratification requirement. Cultivation season duration is another mandatory stratification requirement that could be made optional. Analysis has shown that the mandatory stratification demonstrated in the draft version of the methodology could increase direct sampling costs by 10x compared to the Gold Standard methodology, which is clearly material enough to make the VCS methodology unattractive in comparison.	
182	Bayer BioScience Private Limited	Nitrogen fertilizer application is categorized into four broad groups. However, its usage varies widely. The purpose of stratification is to define the number of direct measurements needed. As fertilizer does not significantly contribute to methane emissions, and the methodology permits emission factors for calculating N2O emissions from fertilizer, we believe fertilizer amount is not needed as a mandatory stratification. Instead, N2O	Thank you for the feedback. The guidance for project stratification has been revised and updated based on PC feedback. Please refer to Appendix 1 and additional guidance through the methodology.

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		emissions from fertilizer can be calculated based on per-field data captured from farmers, and the appropriate emission factors (EFs) can be used to calculate emissions. Making this parameter mandatory will increase the number of strata four times. We request Verra to remove this requirement from the list of mandatory parameters for stratification.	
183	Bayer BioScience Private Limited	Cultivation season duration is mandatory for stratification per Table 3 (Section 6), but the document lacks clear guidance on the categories. The IRRI defines crop durations as short (100–120 days), medium (120–140 days), and long (160+ days). For transplanted rice, it is not clear whether nursery sowing or transplanting dates are considered as starting dates. Crop durations vary across practices and locations even for the same cultivar, complicating standardization (e.g., for the same cultivar, the crop duration can be different for the transplanted cultivation vs DSR). According to the IPCC Guidelines for National Greenhouse Gas Inventories, daily emission factor can be developed from field measurements using the closed chamber technique by dividing total seasonal emission by crop duration. Additional measurements are unnecessary. Cultivation season duration is unlikely to have any significant impact on the daily emission factor. Making this parameter mandatory will increase the number of	Thank you for the feedback. The guidance for project stratification has been revised and updated based on PC feedback. Crop duration has been retained as one of the criteria by which it's mandatory to stratify for purposes of deploying chamber measurements under QA2. Please refer to Appendix 1 and additional guidance through the methodology. Any deviation from the methodology guidance and requirement must be assessed by a VVB.

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		strata 4 times significantly adding to the cost. We request Verra to remove this requirement from the list of mandatory parameters for stratification.	
184	Bayer BioScience Private Limited	Organic amendment application rates also lack clear guidance. Organic amendment application rate depends on several factors like the harvesting practice followed (machine harvesting vs manual harvesting), biomass of the harvested crop, alternate residue management practices (e.g., burning, removal etc). Application rates vary even within specific locations and depend on such factors. Therefore, not all the three (low, medium, high) qualities should be mandatory for the measurement. The application rate to be considered for the stratification should be based on the locally prevalent dominant farming practice (i.e.., machine harvesting or manual harvesting). For the marginal cases of organic amendment rates limited to a few quantification units, use of IPCC scaling factors should be allowed along with the associated uncertainty deductions.	Thank you for your comments. Additional guidance has been provided with respect to organic amendment rate stratification requirements.
185	Bayer BioScience Private Limited	As per stratification criteria (for Quantification Option 2 Direct Measurement) in Table 3 (Section 6) organic amendment (type) is mandatory for stratification. This means the addition of at least three variations (compost, green manure and farmyard manure) in the measurement design. Measurement	Thank you for your comments. Some additional guidance has been provided with respect to organic amendment rate stratification requirements. Please note that we were unable to adopt the recommendation that a materiality assessment be allowed to determine if any given stratification criteria need to be applied, given that would add a lot of complexities to the methodology guidance

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		requirements get multiplied by three. Enormous cost impact. In most parts of India, the practice of using compost, green manure and farmyard manure as an organic amendment is relatively limited. A very small proportion of farmers in each geography apply such organic amendments. The cost of direct measurement does not justify the potential of emission reductions from such a small number of farms / quantification units. Also, it would not be ethical to exclude the farmers following such practices from the project in the absence of the direct measurement of the specific organic amendment type. We request Verra to allow the use of IPCC scaling factors with the associated uncertainty deductions for the organic amendment types other than the rice straw incorporation.	and MRV.
186	Bayer BioScience Private Limited	A three-year historical look-back is required for baseline emission estimation as per the proposed methodology. However, collecting reliable data from farmer interviews over such a time frame is challenging since it is difficult for farmers to remember all these data points for the preceding three years. Remote sensing can only track water regimes and cultivation duration, not organic amendments or nitrogen fertilizer rates. We request Verra to change the look back period to one year	Thank you for your comment. Please note the requirement to utilize a 3-year historical look-back period has been retained - keeping consistency with VCS methodologies, i.e., VM0042.

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187	RiceTec	The methodology narrows the focus to rice and methane; however, is still complex in terms of specificity regarding activities to consider (e.g. energy emissions from equipment changes, three years of detailed historical data, numbers data points)	Thank you for your comment. We added more guidance on data requirements throughout the methodology. We may add further guidance in the future if necessary.
188	The Nature Conservancy	We recommend incorporating aquaculture into the organic amendments list because waste from fish and ducks raised in rice paddies can be significant sources of organic material that increase methane emissions.	Thanks for the feedback. With respect to the requirement to assess organic amendments, for purposes of stratification for Quantification Approach 2, aquaculture should be treated as an organic amendment. Please refer to table 5 in Appendix 1 for more details. Note that any deviation from the methodology guidance and requirement must be assessed by a VVB.
189	Olam Agri Pte Ltd	With reference to the Baseline Scenario (Section 6) and the most recent VCS Standard, 4.7 (Section 3.2.5), "The project proponent shall… reassess the baseline every 10 years," which appears to be reflected in footnote 1 on page 5 of definitions but footnote 6 in section 6 references Standard 4.7 Section 3.2.7 which suggests in point (3) that the 10-year reassessment is exempted. What is the correct reassessment frequency assumption for the projects? This also occurs in section 9.4 (10-year re-assessment)	Thank you for your comment. As per updated methodology guidance, "At crediting period renewal, the validity of the original baseline scenario must be reassessed. Where the original baseline is determined to be invalid, a new baseline scenario reflecting current rice production practices in the region must be developed. For more details, see the most recent rules on baseline reassessment and project crediting renewal in Sections 3.2.7 and 3.9.8 of the VCS Standard, v4.7 or equivalent sections of the most recent version." (Footnote 1)
190	Olam Agri Pte Ltd	In reference to the Baseline Scenario (Section 6) and Monitoring Requirements for Quantification Approach 2 (Section 9.1), the strata sampling, while clear in theory is	Thanks for the feedback. Appendices 1 and 2 have additional guidance for project stratification and GHG measurements.

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		less clear in practice with smallholder farmers. Is there a better way to grant guidance on how these 3 samples may be better defined to ensure integrity of results without potentially driving up costs?	
191	Indigo Ag	It's not clear what is meant by this sentence: "In circumstances where climatic conditions result in a monitoring period's cultivation season lasting longer than the baseline cultivation season, project proponents may set the baseline cultivation season duration using monitoring period data derived from baseline control sites." I think some language tweaks and, perhaps, a diagram would be helpful. Additionally, rather than artificially change the length of the season, it would be more effective to assess the baseline using its actual duration, divide by the number of days in the baseline season to calculate the daily average, then multiply by the number of days in the project scenario to achieve a comparable value. This represents what the emissions would have been using baseline scenario management under project scenario conditions.	Thank you for your comment. The intent behind this guidance is to say that if the cultivation season is longer in the project scenario, relative to the baseline, and that is caused not by the project, but by climatic conditions, then the baseline cultivation season duration will be set to match the project scenario cultivation duration. The baseline value can be set using baseline control sites rather than baseline values.
192	Indigo Ag	Farmers in the US commonly rotate fields between rice and other crops, such as soybean (with the exception of zero-grade fields, which are typically planted with rice every year). Furthermore, GHG emissions can be impacted by the crop grown in the	Thank you for your comment. Applicability condition 9 states that projects cannot switch off-season practices to be able to use this methodology. Therefore, off-season conditions need to remain static. A project would need to select a practice used in the off-season and continue

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		previous year. Additional guidance may be helpful on how to use historical crop rotations to construct the baseline scenarios and estimate emissions.	only that practice throughout the lifetime of the project.
193	Indigo Ag	Soil texture, particularly clay and silt percent, can be an important predictor of GHG emissions from rice fields. It might be worth adding clay or silt percent as an optional stratification factor in Table 3. We would also recommend making clay or silt percent a required element when forming strata for Quantification Approach 2 (direct measurement), and to provide additional guidance on how to form strata on soil texture, e.g. using the quartiles of silt percent on project fields.	Thank you for your comment. Table 5 has been updated to include soil texture as a recommended/optional stratification criteria.
194	Indigo Ag	Table 3 lists "Water regime - pre-season" as a mandatory activity in the baseline schedule. However, it might be unclear whether this includes winter flooding. Winter flooding is a common practice in parts of the US, and as suggested in Section 9 page 46, is commonly done to create duck habitats. It may be helpful to more explicitly state: i) whether winter flooding is a mandatory activity in the baseline schedule, and ii) whether changes in winter flooding practices can or should be taken into account when calculating emission reductions and credits. For example, if winter flooding was not done in the	Thanks for the feedback. The simplified categories in Table 5 should be sufficient for stratification purposes. For setting baseline data for each farm, the more detailed categories in Table 5.13 of the 2019 Refinement to the 2006 IPCC Guidelines for National GHG Inventories must be used. Any methodology deviations must be assessed by a VVB.

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		baseline but is done in the project, should the increase in winter-time CH4 emissions be accounted for when calculating emission reductions? Or if winter flooding was done in the baseline but is not done in the project, can those emission reductions be counted towards credits?	
195	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	The suggested amendment above to include use of methanotrophs as an eligible project type on its own would yield no requirement to chance Baseline scenario or project scenario setting or definitions. The same requirement on delineation of strata would apply and the control site per strata in the project scenario under Quantification Approach 2. In quantification approach 1 - impact of methanogens would be included in the modelling.	Thank you for your comment. The methodology guidance has been updated to clarify that changes in irrigation management are required. Projects implementing the use of methanotrophs as an "optional project activity" must adopt the quantification approach 2 Measurements. Due to the lack of a scientific-driven dataset from field measurements and a model parametrized to estimate the impact of the use of methanotrophs in emission reductions, the methodology does not allow for the adoption of QA1—Modelling. Note that any deviation from the methodology guidance must be assessed by a VVB.
196	Ostrom Climate Solutions	Methane emissions from soil bacterial activity in agricultural wetlands are influenced by temperature, water management, organic matter, plant physiology, soil chemical and biological properties (Airani et al., 2022; Ball 2013; Brye 2016; Oertel et al., 2016; Sass et al., 1994; Shakoor et al., 2021). Soil texture has been documented by numerous studies as an important factor influencing CH4, N2O, and CO2 emissions in rice paddy farming (Airani et al., 2022; Oertel et al., 2016; Shakoor et al., 2021). Research from rice paddies in China, Indonesia, and	Thank you for your comment. Table 5 has been updated to include soil texture as a recommended/optional stratification criteria.

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		the United States correlate soils with higher porosity sandy loam textures to have greater CH4 emissions compared to finer textured soils (Airani et al., 2022; Brye et al., 2013; Tirol-Padre et al., 2018; Zhang 2012). Higher porosity soils can reduce CH4 emissions by 27.6% when implementing AWD, compared to a 17.3% reduction from lower porosity soils relative to CF irrigation methods (Airani et al., 2022). A 1994 multi-year study found a direct correlation between the percentage of sand in soils and seasonal methane emissions from rice fields [Sass]. Soils with sand content ranging between 18.8% and 32.5% saw a range in seasonal methane emissions between 15.1g/m2 to 36.3g/m2, respectively (Sass et al., 1994). This study shows a strong linear correlation between the percentage of sand in soils and seasonal methane emissions, and suggests that methane emissions from different soil types may be compared by correcting for the percentage of sand (Sass et al., 1994). There may be a higher transmission of CH4 from higher porosity soils due to the greater abundance of pores that entrap less CH4 for re-oxidation (Neue, 1993; Rogers et al., 2014; Zhang 2012). Nitrous oxide emissions are also found to be higher with coarse textured soils in some studies (Airani et al., 2022; Sass et al., 1994). Other studies have found a significant positive relationship between CH4	

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		emissions from finer, clay textured soils from various study sites over a multi-year period (Dutaur and Verchot, 2007; USDA 2008; Shakoor et al., 2021). A global meta-analysis from 48 peer reviewed publications from 1989 to 2019 of soil characteristic effects on greenhouse gas emissions from agricultural soils reveals a strong correlation between soil texture and GHG emissions (Shakoor et al., 2021). The higher concentration of CH4 emissions was found in finer textured soils, and N2O emissions were found to be greater in coarse-textured soils (Dutaur and Verchot, 2007; Shakoor et al., 2021). This could be due to fine textured soils holding in more moisture, leading to anaerobic conditions that are able to be maintained for longer periods of time, promoting CH4 under anaerobic conditions (Dutaur and Verchot, 2007). Maximum emissions of CO2 were observed in fine-textured soils (Dilustro et al., 2005; Shakoor et al., 2021). Some studies also find CO2 emissions to be higher with fine textured soils compared to sandy soils during warm, dry periods (Dilustro et al., 2005). The contrasting emissions of GHGs from different soil textures may be attributed to site specific attributes, local climate, land management practices, or other properties. However, based on multiple results across different literature findings, there is a strong link between soil texture and GHG emissions, and our recommendation based	

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		on these findings is that soil texture needs to be included as a requirement for stratification in the M0253 methodology. This will ensure that projects verified under this methodology will be robust in their estimates of GHG emissions in their baseline and emissions reductions from the implementation of AWD across different project sites. References: Ariani, M., Hanudin, E., & Haryono, E. (2022). The effect of contrasting soil textures on the efficiency of alternate wetting-drying to reduce water use and global warming potential. Agricultural Water Management, 274. https://doi.org/10.1016/j.agwat.2022.107970 Ball, B. C. (2013). Soil structure and greenhouse gas emissions: A synthesis of 20 years of experimentation. European Journal of Soil Science, 64(3), 357–373. https://doi.org/10.1111/ejss.12013 Brye, K. R., Nalley, L. L., Tack, J. B., Dixon, B. L., Barkley, A. P., Rogers, C. W., Smartt, A. D., Norman, R. J., & Jagadish, K. S. V. (2016). Factors affecting methane emissions from rice production in the Lower Mississippi river valley, USA. Geoderma Regional, 7(2), 223–229. https://doi.org/10.1016/j.geodrs.2016.04.005	

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		Jund, M. F., & Turner, F. T. (1994). Methane emissions from rice fields: Effect of soil properties. In GLOBAL BIOGEOCHEMICAL CYCLES (Vol. 8, Issue 2). Shakoor, A., Shakoor, S., Rehman, A., Ashraf, F., Abdullah, M., Shahzad, S. M., Farooq, T. H., Ashraf, M., Manzoor, M. A., Altaf, M. M., & Altaf, M. A. (2021). Effect of animal manure, crop type, climate zone, and soil attributes on greenhouse gas emissions from agricultural soils—A global meta-analysis. In Journal of Cleaner Production (Vol. 278). Elsevier Ltd. https://doi.org/10.1016/j.jclepro.2020.124019 Tirol-Padre, A., Minamikawa, K., Tokida, T., Wassmann, R., & Yagi, K. (2018). Site-specific feasibility of alternate wetting and drying as a greenhouse gas mitigation option in irrigated rice fields in Southeast Asia: a synthesis. Soil Science and Plant Nutrition, 64(1), 2–13. https://doi.org/10.1080/00380768.2017.1409602 United States Environmental Protection Agency (USEPA), 2016. Inventory of U.S. green- house gas emissions and sinks: 1990–2014. Available at:. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.	

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		Wassmann, R., Neue, H.-U., Lantin, R. S., Buendia, L. v, & Rennenberg, & H. (2000). Characterization of methane emissions from rice fields in Asia. I. Comparison among field sites in five countries. Zhang, Y., Su, S., Zhang, F., Shi, R., & Gao, W. (2012). Characterizing spatiotemporal dynamics of methane emissions from rice paddies in Northeast China from 1990 to 2010. PLoS ONE, 7(1). https://doi.org/10.1371/journal.pone.0029156	
197	TotalEnergies Nature Based Solutions	We would recommand adding soil texture (for example sand vs clay) as a stratification criteria as this parameter is expected to impact the duration and intensity of flooding and associated methane emissions	Thank you for your comment. Table 5 has been updated to include soil texture as a recommended/optional stratification criteria.
198	VGS	Table 3. Agroforestry spices less than 3 years to be considered in baseline scenario as optional	Thanks for the feedback. Agroforestry projects could use VM0042.
199	AgriCapture, Inc	We believe the registry should provide guidance to clarify the distinction, if any, between the adoption comparison used for baselining and the common practice additionality test. As its written, we interpret the common practice additionality assessment to indicate that the adoption in question should be compared to the adoption rate at a state or providence level.	Thanks for the feedback. The methodology adopts the new VCS tool for Additionality (VT0008), which provides more detailed guidance. Also, we added new guidance specific to the methodology for further clarification.

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		In the baseline scenario section, its unclear whether the schedule of activities should be populated using regional data or field specific data from each field in the program. Our team would advocate for regional data to drive baseline calculation. The mandatory requirement list (table 3) for calculating a baseline will create a barrier to entry for farmer wanting to enrol in carbon projects. Allowing for regional baselines to be used would remove this barrier and allow carbon projects to scale, encouraging greater adoption of improved rice cultivation practices.	
200	AgriCapture, Inc	In the Southeast United States, rice is grown in rotation with other crops, primarily soybean. In the current language of the methodology definitions and section 6, its unclear how rotational crops should be considered in the historical look back periods and schedule of activities. If baselines are to be set at the actual field level, we need further guidance on which growing seasons should be considered in the schedule of activities. For example, a field rotates between rice and soybean each year in the following order Y1 Rice Y2 Soybean Y3 Rice Y4 Soybean Y5 Rice. Should Y1,Y3, and Y5 be defined as the schedule or activities, or should Y1,Y2, and Y3?	Thanks for the feedback. The methodology has been updated; please refer to the revised guidance of section 6.

Section 7 - Additionality

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201	Anonymous	Common practice is assessed at the provincial or state level. Thus, projects are ineligible due to failing under additionality, if AWD is practiced by more than 20% of farmers within a particular state or province. This seems quite a constraining clause that would exclude a lot of areas where AWD is not uncommon (particularly at a district or drainage management level), but CF still remains a practice used by many. We believe common practice should be assessed at a more granular scale than state or province.	Thank you for your comment. The VCS rules, based on those developed under the CDM, set the threshold for common practice for the determination of additionality at 20%. This assessment can be conducted at the national or sub-national (jurisdictional) level and allows for flexibility based on data availability. Please refer to section 7 of VM0051 and VT0008 for additional guidance.
202	University of Uppsala	Step 3 It is important to mention the order of preferred and credible sources to use; in the absence of this statement, this section could be used to generate a partial/preferential set of data for supporting the case. Could lead to artificial ER estimates.	Thank you for your comments. Please note the guidance in section 7 of the methodology has been updated to align with the new VCS Additionality Tool (VT0008), and additional guidance has been added to the methodology as recommended.
203	AgriCapture, Inc	In agriculture, farmers are typically slow to change practices due to strong cultural and social ties to historical farming behaviour. Adoption of practices can vary widely across a state based on local customs or family farming traditions. As such, we believe the methodology should be revise to include an optional common practice additionality analysis at the county level, if a practice exceeds the adoption threshold	Thank you for the feedback. The VCS rules, based on those developed under the CDM, set the common practice threshold for determining additionality at 20%. This assessment can be conducted at the national or subnational (jurisdictional) level and allows for flexibility based on data availability. However, the 20% figure for the common practice threshold cannot be changed.

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		at the state level. Additionally, we note that the common practice adoption threshold of 20% may be too restrictive for application in agriculture. As noted above, farmers are typically slow to adjust practices. Practice adoption rates for new approaches/technologies are inconsistent with other industries. Financial or efficiency gains alone may not influence a farmer to adopt a new practice. Even if a practice is adopted in more than 20% of a region, a steep adoption curve may still exist. This has been recognized by similar methodologies through a more lenient adoption threshold. CAR Soil Enrichment Protocol uses a threshold of 50%.	
204	RiceTec	Methane from rice production is the source of 6.5% of the world's CO2e; activities to avoid methane production by any farmer in any year is necessary and a positive; thus, to disallow a practice that is conducted on more than 20% of the acres is a severe limitation to enabling a significant reduction in methane production. Suggest removal of additionality from the methodology	Thank you for the feedback. The VCS rules, based on those developed under the CDM, set the common practice threshold for determining additionality at 20%. This assessment can be conducted at the national or subnational (jurisdictional) level and allows for flexibility based on data availability. However, the 20% figure for the common practice threshold cannot be changed.
205	Indigo Ag	Section 6 states that the "[t]he [additionality] analysis must be conducted separately for main project activities and optional project activities" and provides details on how to carry out those separate analyses. In addition, page 14 states "Step 3: Demonstrate that adoption of the main	Thank you for your comment. We will clarify the language listed in items 1 and 2 within the 20% activity penetration threshold for single or weighted grouped activities to more clearly state what is or is now allowed. However, the VCS rules, based on those developed under the CDM, set the threshold for common practice for the determination of additionality at 20%. This

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		project activity(ies) and/or suite of proposed optional project activities is not common practice." However, it could help to clarify exactly what the consequences are if a certain set of practices do or do not pass the additionality requirements. For example, if none of the main activities pass additionality, is the field not qualified for the program? If one main activity passes (e.g. DSR) but the optional activities do not pass (e.g. row rice and avoided burning), should the project scenario calculations be done assuming that the optional activities (e.g. row rice and avoided burning) were not implemented, so as to match the baseline? Is that even possible if using Quantification Approach 2 (direct measurement)? If the intent of additionality is to make a yes/no decision on whether a field qualifies for a program, then it may make sense to revise Section 6 to explicitly state that at least one main activity must pass for a field to qualify. If the optional activities result in credit generation, then additionality must be assessed for them as well. But it is critical that the methodology include guidance for how to quantify the baseline if only a portion of the project activities are not able to pass the additionality test, especially in regards to measurement-only projects.	assessment can be conducted at the national or sub-national (jurisdictional) level and allows for flexibility based on data availability. Therefore, the 20% figure for common practice threshold cannot be changed.
206	Climate Wedge Ltd Oy and	Section 1) middle of the page. This qualification is a limitation on the adoption	Thank you for your comment. The VCS rules, based on those developed under the CDM, set the threshold for

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	NewLeaf Symbiotics LLC	of methanotrophs in areas where e.g. AWD has a penetration rate above 20%. It would seem counterintuitive to limit the application of methanotrophs (that provide a further CH4 reduction yield) in situations where the AWD limit has been reached. in our opinion this further supports the above proposed change to carve out the use of methanotrophs as its own separate project category.	common practice for the determination of additionality at 20%. This assessment can be conducted at the national or sub-national (jurisdictional) level and allows for flexibility based on data availability. However, the 20% figure for common practice threshold cannot be changed.
207	VGS	Step 3 : point 8. Agricultural University Research or survey reports to be considered for common practices	Thank you for your comment. The VCS rules, based on those developed under the CDM, set the threshold for common practice for the determination of additionality at 20%. This assessment can be conducted at the national or sub-national (jurisdictional) level and allows for flexibility based on data availability. However, the 20% figure for common practice threshold cannot be changed.

Section 8 - Quantification of Estimated GHG Emission Reductions - Overall Section Feedback

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208	Not Disclosed	Material Error 1. P42 in Section 8.5.4 of M0253 said the following: *8.5.4 Uncertainty Deductions* *Uncertainty deductions are estimated and*	Thank you for the input. As per Section 2.3.4 of VCS Methodology Requirements v4.4, if uncertainty is < 10%, the methodology may exclude random uncertainty. Regarding the 100% limit, the methodology's assessment indicates that the uncertainty of the overall

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		applied separately for each source of reductions and removals within the project boundary. This deduction is estimated using a probability of exceedance method as follows (see Section 2.4 of the VCS Methodology Requirements, v4.4): However, there is a material error in section 2.4 of the VCS Methodology Requirements v4.4 that would lead to the overestimation of ERs for a project if 38.19%<uncertainty of ERs for this project<=100% when this project references and applies the section 2.4 of the VCS Methodology Requirements v4.4 as per M0253. This material error has already been identified and detailed with blue text in the Rationale Diagram for Uncertainty Discount below. Please see the Material Error 1 in this diagram for details.	impact shall be below this threshold (<100%) for all project types under this methodology. Yet, note that a methodology may incorporate more stringent requirements.
209	Not Disclosed	Material Error 2. P42 in Section 8.5.4 of M0253 said the following: *8.5.4 Uncertainty Deductions* *Uncertainty deductions are estimated and applied separately for each source of reductions and removals within the project boundary. This deduction is estimated using a probability of exceedance method as follows (**see Section 2.4 of the VCS Methodology Requirements, v4.4**):*	Thank you for the input. As per Section 2.3.4 of VCS Methodology Requirements v4.4, if uncertainty is < 10%, the methodology may exclude random uncertainty. Regarding the 100% limit, the methodology's assessment indicates that the uncertainty of the overall impact shall be below this threshold (<100%) for all project types under this methodology. Yet, note that a methodology may incorporate more stringent requirements.

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		However, there is a another material error in section 2.4 of the VCS Methodology Requirements v4.4 that would lead to the overly underestimated ERs for a project if 10%<uncertainty of ERs for this project<=30% when this project references and applies the section 2.4 of the VCS Methodology Requirements v4.4 as per M0253. This material error has already been identified and detailed with blue text in the Rationale Diagram for Uncertainty Discount below. Please see the Material Error 2 in this diagram for details.	
210	Not Disclosed	Material Error 3. P42 in Section 8.5.4 of M0253 refers to the following equaiton-34: (see figure 4 below this table) However, according to section 2.4 of the VCS Methodology Requirements v4.4, equation-34 is only applicable to the scenarios in which the uncertainty of ERs for a project is located within the range of 10% and 100% under the confidence of 90% (two-sided interval), in other words, equation-34 is not applicable to two scenarios: Scenario 1: uncertainty of ERs for this project<10% under the confidence of 90% (two-sided interval); Scenario 2: uncertainty of ERs for this project>100% under the confidence of 90% (two-sided interval). Please see section 2.4.3 of the	Thank you for the input. As per Section 2.3.4 of VCS Methodology Requirements v4.4, if uncertainty is < 10%, the methodology may exclude random uncertainty. Regarding the 100% limit, the methodology's assessment indicates that the uncertainty of the overall impact shall be below this threshold (<100%) for all project types under this methodology. Yet, note that a methodology may incorporate more stringent requirements.

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		VCS Methodology Requirements v4.4 that speficies the requirements regarding Scenario 1 and section 2.4.5 of the VCS Methodology Requirements v4.4 that speficies the requirements regarding Scenario 2. Therefore, section 8.5.4 of M0253 should specifies the following prerequisite for applying equation-34: Equation-34 can be used only under the prerequisite that the uncertainty of ERs for a project is located within the range of 10% and 100% under the confidence of 90% (two-sided interval).	
211	Not Disclosed	Material Error 4. P42-p43 in Section 8.5.4 of M0253 does not contain any information related to section 2.4.3 and section 2.4.5 of the VCS Methodology Requirements v4.4. Absence of the information in M0253 related to section 2.4.3 of the VCS Methodology Requirements v4.4 would result in overly underestimated ERs for a project applying equation-34 of M0253 when uncertainty of ERs for this project is lower than 10%. Absence of the information in M0253 related to section 2.4.5 of the VCS Methodology Requirements v4.4 would result in overly overestimated ERs for a project applying equation-34 of M0253 when uncertainty of ERs for this project is higher than 100%. Therefore, relevant requirements related to	Thank you for the comment. A clarification has been added to the methodology.

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		sections 2.4.3 and 2.4.5 of the VCS Methodology Requirements v4.4 should be included or reflected in section 8.5.4 of M0253.	
212	Not Disclosed	Material Error 7. P43 in Section 8.5.4 of M0253 refers to the following figure 2: (see figure 7.1 below this table) However, Figure 2 is totally wrong according to the Rationale Diagram for Uncertainty Discount as illustrated below. Therefore, the figure 2 should be deleted from M0253. I think that the figure 2 was completed based on the footnote 3 of the VCS Methodology Requirements v4.4 (footnote 3: This conservativeness deduction is based on Climatic Change 166, 26 (2021) available at https://doi.org/10.1007/s10584-021-03079-z.) However, Fig.1 contained in the peer-reviewed scientific literature of footnote 3, as shown as below, is also totally wrong according to the Rationale Diagram for Uncertainty Discount as illustrated below (See figure 7.2 below this table)	Thank you for the detailed assessment and rationale. Verra clarifies the following: As per Section 2.4 of the VCS Methodology Requirements v4.4, and to conform with the conservativeness principle, all VCS credits ER are likely (66%-100%) to be underestimated. This is done by applying a discount factor to the point of an estimate to reduce the value being credited to reach the 66% probability (in a normal distribution, this means a t value of ~ 0.43). For those cases where the uncertainty is below 10% (i.e., std dev < ~6% relative to the mean), the discount factor would be ~2.6%, and therefore deemed negligible and not required to be applied. The assessment done in the "Rationale Diagram for Uncertainty Discount" focuses on the right side of the distribution, which is the safe zone: where the project estimation (the mean value) is lower than the unknown true value, so ERs are conservative. With that, the approach described is based on the difference between the uncertainty of the project and the 10% limit. Although this may be applied in other standards, it mixes two different concepts that are not directly linked: a) how uncertainty is defined, and b) how conservativeness is defined.
213	Not Disclosed	Material Errors 8 and 9. P42 in Section 8.5.4 of M0253 refers to the following equaiton-34: (See figure 8.1 below this table)	Thank you for the comment. The definition has been revised.

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		Where: (See figure 8.2 below this table) However, 66.66% is mistakenly defined above as significant level α. As demonstrated for situation 4 under case 2 in Rationale Diagram for Uncertainty Discount as illustrated below, 66.67% is the confidence/probability for ERtrue, which has a different meaning from significant level α. Furthermore, as demonstrated in Rationale Diagram for Uncertainty Discount as illustrated below, the significant level α of 5% (i.e., overestimation risk) was applicable to and applied to case 1 and case 2. Finally, as a common sense in statistics the significant level α is general as 5% or 10%, and it is impracticable that the significant level α is as high as 66.66%. Therefore, the definition for the significant level α of 66.66% in M0253 is wrong (Material Error 8). According to the VCS Methodology Requirements v4.4 (p15) or Rationale Diagram for Uncertainty Discount (situation 4 under case 2), 66.67% should be applied rather than 66.66% used in section 8.5.4 of M0253. This is a Material Error 9. Therefore, the definition for tα=0.666 should be revised as follows: t-value for a one-sided 66.67% confidence interval, approximately 0.4307;	

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		dimensionless	
214	Regrow Ag	This section states "Where the project involves the introduction of a new cultivar with a materially different root biomass to the cultivar(s) used in the baseline, it must be demonstrated that the model domain sufficiently covers such changes." When considering cal/val requirements under the QA1, VM0053, which has a single rice crop functional group, research has shown variability in rice methane emissions across different rice varieties. Therefore, Verra should consider defining a sub-crop functional category for rice varieties to reflect this variability.	Thank you for your comment. With respect to QA1 modelling requirements, this methodology defers largely to the detailed requirements in VMD0053 and VM0042. Cal/val requirements in those documents should be followed with respect to modelling under this methodology.
215	Regrow Ag	This section states, "Projects using QA1 must take initial measures of SOC at the project start for use within the model." We agree that soil data is an important parameter when modelling GHG outcomes in rice cultivation. However, we believe that soil samples can also be inaccessible in these systems and significantly impact the scalability of a program. Therefore, we recommend allowing SOC, clay, and other soil values to come from other reliable data sources if applied conservatively.	Thank you for your comment. The methodology requires an initial SOC sampling when using QA1: Modeling. For further details on guidance on the timing of soil sampling, refer to footnote 14 of VM0051, v1.0.
216	Anonymous	The project is explicit about the use of static closed chamber measurements for Quantification Approach 2. New	Thank you for your comment. The requirements to use GC equipped with FID are maintained, as they represent conventional best practices. Nonetheless, as the

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		technologies could be developed which are more accurate or cheaper than closed chamber measurements. Have you considered adding something like the following, which is taken from VMD0053 V2 in relation to soil carbon – 'Newer methods for SOC stock monitoring are becoming available that are able to observe changes with greater precision at shorter time intervals. New and novel methods for SOC monitoring will be acceptable where there is peer-reviewed support of the method or independent expert support, both of which must be approved by the IME'	technology evolves and proves to be robust, applicable, and accessible to project applications, Verra will consider future use of those innovative technologies.
217	Anonymous	Quantification Approach 1 requires projects to make initial measures of SOC. The methodology does not give any guidance on how to take SOC measurements (e.g. it does not refer to the requirements of VM0042 in regard to sampling density or analysis requirements etc.). As soil sampling is very costly, guidance should be given on the approach required.	Thank you for your comment. The methodology requires an initial SOC sampling when using QA1: Modeling. For further details on guidance on the timing of soil sampling, refer to footnote 14 of VM0051, v1.0.
218	Anonymous	Quantification Approach 1 requires projects to follow the requirements of VMD0053. The biggest challenge we see in SOC projects with VMD0053 is the need for diachronic data for model validation. As per VMD0053 (page 18), 'Datasets to validate model performance and uncertainty must adhere to the following guidelines: …In the case of SOC stocks, repeat measurements of SOC stock change must be able to	Thank you for your comment. This methodology defers largely to VMD0053 and VM0042 regarding modelling requirements. Note that projects may opt to use one of the other 2 QAs, should modelling requirements be prohibitive.

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		capture multi-year changes, as practice effects on SOC may combine short and long-term changes in soil biogeochemical processes. Measurements from paired fields leveraging space-for-time analysis methods that approximate multi-year changes may be used for SOC validation'. In other words, VMD0053 requires models to be validated against their ability to 'predict SOC stock change' and not start SOC stocks. This seems like an onerous requirement for rice projects where the main emission reduction is methane, yet projects using models will need to validate this model basis diachronic soil data.	
219	Anonymous	The methodology states that 'each cultivation period commences at land preparation and continues until harvest or post-season drainage'. I assume harvest and post-season drainage can happen at different times. For the end of the cultivation period, it does not give any indication of which to choose if they happen at different times. For conservatism, it could say something like '…and continues until harvest or post-season drainage, whichever occurs first'.	Thank you for your comment. The definition of cultivation period is revised as follows: "The period of time that begins with pre-planting preparation in rice fields and ends at the harvest event". Please refer to Section 3.
220	University of Uppsala	Sufficient guidelines for hand-held and automated measurement approaches should be incorporated or appropriate guidelines should be cited for the project developers.	Thank you for your comment. The requirements to use GC equipped with FID are maintained, as they represent conventional best practices. Nonetheless, as the technology evolves and proves to be robust, applicable, and accessible to project applications, Verra will

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			consider future use of those innovative technologies.
221	University of Uppsala	Thirdly, the measurement approach for quantifying CH4 emission (and N2O) needs to be described in detail - especially, since the 7-day frequency of sampling would create artifactually high or low (under or over-estimation) fluxes and thus, could significantly reduce the confidence on the methodology and would pit this against existing methodologies (See 10.1080/17583004.2015.1082233 for details). Furthermore, the limitations and uncertainties of overestimation of fluxes, particularly N2O are discussed here 10.1073/pnas.1817694116). In short, event-based and higher sampling frequency – at least daily following fertilizer application events or aeration events as well as carefully spaced frequency during flooded periods is important.	Thanks for the feedback. Please refer to Appendix 2 for detailed guidance on GHG measurements. Note under QA 2 only CH4 fluxes measurement is allowed, for the estimation of N2O fluxes, PP may choose QA1 or QA3.
222	University of Uppsala	In addition it could help a) incorporate requirements to quantify and report minimum detection level (MDL) for CH4 and N2O fluxes that incorporate both sampling as well as analytical accuracy (useful reference: 10.1002/etc.4847 and 10.1080/17583004.2015.1082233). The majority of studies and datasets often ignore reporting MDL and if single-year measurement can be applied for several years – it could easily lead to artefactual overestimation of serious underestimation	Thank you for your comment. A new appendix 2 has been created which contains guidance for Quality Assurance/Quality Control for direct measurement of methane using flux chambers. We have included the following guidance, each project must ensure their sampling and analysis protocol is optimized for sampling for rice systems, including any necessary adjustments for moisture and ambient concentrations of methane, and each project must report minimum detection levels, and ensure standard gas mixtures used to calibrate/validate their equipment spans the concentration ranges being detected. The guidance also

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		of hourly fluxes and subsequently seasonal aggregate. b) CH4 and N2O standard gas mixtures should span the concentration range being detected.	provides links to the following two references: Optimisation of the gas chromatograph analytical protocol is detailed here: 10.1080/17583004.2015.1082233. & https://www.ars.usda.gov/natural-resources-and-sustainable-agricultural-systems/soil-and-air/docs/gracenet-sampling-protocols/
223	Bayer BioScience Private Limited	The methodology suggests using default values for N2O. If direct measurement is undertaken for CH4, then N2O emissions can also be measured directly, as the inclusion of an additional GHG(N2O) does not significantly increase the cost.	Thank you for the comment. QA 2 is only available for CH4 direct measurements. We have updated the guidance throughout the methodology to reflect this. Regarding field measurement of N2O fluxes, these measurements and flux estimations are highly complex due to the spatial and temporal variability of N2O fluxes and measurement requirements. Therefore, the methodology conservatively does not allow those measurements since they remain cost-prohibit, and a simpler measurement approach could result in under- or over-estimations of emission reductions.
224	String Bio	Current Clause Page 18, Page 20 (Diagram) Flux in all other trace GHGs (such as N2O from soils, CO2 from energy usage, and combustion emissions related to avoided biomass burning) must be accounted for using the default emission factor approach. Page 40 Quantification Approach 2 is applicable for flux of CH4 and optionally also N2O.	Thank you for the feedback. The methodology guidance has been updated, and under QA2, only CH4 measurements are allowed. Please refer to Appendix 2 for more details on CH4 flux chamber measurements.

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		Feedback Guidelines for N2O measurement are ambiguous and refers to different Quantification approaches throughout the document. On Page 18 all other GHGs outside CH4 are required to be calculated by Emission Factor approach but on Page 40, it is mentioned that Quantification Approach 2 is applicable optionally for N2O as well. We request Vera to clarify instances where direct N2O flux measurement is valid option.	
225	NetZeroAg	Table 4 is misleading because the cell for N2O/ Approach 2 is empty, but – if I understand it correctly – Approach 3 should be mandatory in this case; this could be stated in the cell or in a footnote	Thanks for the feedback. Table 4 has been updated accordingly.
226	NetZeroAg	In Table 3, the approach with subnational EF can be applied to any project scale. How is this justified? The potential sources of subnational EFs are only vaguely defined and should be illustrated by 1-2 examples.	Thanks for the feedback. The use of Tier 1 Global or Regional EF is allowed for projects with a capacity limit equal to or less than 60000 tCO2e per year. Refer to section 8 of the methodology for further details.
227	NetZeroAg	I assume that there was a mix-up of synthetic and organic N fertilizer (FracGASM,I,S) in the definitions of equation (13)	Thank you for the feedback. The methodology guidance has been revised accordingly. Refer to subsection 8.2.6 of the methodology.
228	NetZeroAg	The statement on p. 31 presumably applies to Approaches 2 and 3, but not to	Thank you for your comment. Unfortunately your feedback lacks sufficient detail for us to determine the

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		Approach 1	nature of your feedback. We have reviewed the given section again and see no need for changes. Thank you.
229	NetZeroAg	The term "Tier 1a" is not used anywhere in the 2019 Refinement -- neither in the 2006 Guidelines	Thank you for the feedback. The methodology has been revised, and the term "Tier 1a" has been removed.
230	NetZeroAg	Conceptually, the consideration of biomass end uses cannot be aligned with the project boundaries limited to on-site emissions. It is hard to fathom that the emissions caused by the use of straw for erosion control will not depend on the distance of transport.	Thanks for the feedback. The methodology guidance regarding biomass end uses has been revised. Please refer to subsection 8.3.1 for details.
231	NetZeroAg	The unit in the upper right cell missed out "/ t dry straw"	Thanks for the feedback. The methodology has been revised accordingly.
232	RiceTec	New cultivars can have a positive impact on avoidance of methane emissions because characteristics such as the cultivar's plant physiology, the anatomy of organs, tissues, and cells, and other characteristics like maturity cycle, drought tolerance, etc. that could reduce methane production, and/or enhance methane oxidation, and/or reduced transport of gasses to the atmosphere. Therefore, when addressing the adoption of new cultivars the protocol should consider the various characteristics that make new cultivars a better practice to improved ALM. In the proposed version it is unclear what it means to demonstrate that the model	Thank you for your comment. The methodology's guidance regarding root biomass was meant to address a potential reduction in C-input to soils. This methodology defers to the extensive guidance in VM0042 and VMD0053 with respect to modelling. With respect to the use of new cultivars aiming to reduce CH4 emissions, those projects must adopt QA2 direct measurements.

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		sufficiently covers a change in cultivar with materially different root biomass and it is unclear what makes the root biomass materially different; clarification is needed and the work Verra envisions should not in any way slow the adoption of a new cultivar that can reduce methane emissions. Regarding root biomass, it's known that rice plants regulate CH4 emissions by facilitating its production, oxidation, and transport. While it has been suggested that smaller root biomass could release less root exudates that are used by soil methanogens microbial organisms as C sources for CH4 production, it is important to consider that root biomass is a critical component of the plant architectural design that allows for proper nutrition, water uptake, and plant anchoring to the soil, and therefore, changes in root biomass must be carefully considered, designed, and tested to avoid negatively affecting cultivar environmental fitness and productivity.	
233	RiceTec	Research in multiple countries has shown that hybrids can emit less methane compared to varieties, while also producing more yield. Verra or a public third party (e.g. IRRI, USDA) could create a register of rice cultivars that have been proven (either by a peer review publication utilizing a standard procedure or through standard trials run by designed public organizations) to produce lower CH4 emissions than traditional cultivars and that those are	Thanks for the feedback. Please refer to Section 4 Applicability Conditions; note that the introduction of a new cultivar is an "optional project activity" that must adopt QA2. Any deviation from the methodology guidance and requirements must be assessed by a VVB.

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		granted a differential emission factor. Breeders of these cultivars which are interested to have their cultivars in the registry/catalog of approved cultivars could submit these hybrids for verification in these standardized tests and cover expenses for such a test	
234	RiceTec	Inclusion of direct measurement is good because it reduces the burden on farmers to provide data. Currently it is quite costly, but future adoption may lower the costs and make this a viable option for many fields	Thanks for the feedback.
235	RiceTec	Additional information is needed on how geographically specific emissions factors must be to be applicable. IPCC includes country factors - is this sufficient? If multiple factors are needed for a country then what is the required geography?	Thanks for the feedback. The methodology guidance has been revised, and further guidance on using EF was added throughout.
236	CarbonFarm Technology	VMD0053 allows for both empirical and process-based models. It appears that the draft methodology is inconsistent with this approach. While process-based models are included, empirical models appear to be excluded and a new, hybrid, process-based surrogate model type is added. Changing the models accepted under VMD0053 not only seems inconsistent, but equally does not appear to fall under the scope of the new methodology. Moreover, the addition of process-based	Thanks for the feedback. The methodology has been revised. Note that, under QA1, modelling guidance from VM0042/VMD0053 must be followed for empirical or process-based models. Also, empirical models have been removed.

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		surrogate models in lieu of empirical models is, in itself, concerning. By combining aspects of both process-based and empirical approaches, surrogate models increase complexity to what is an already complex matter. By removing purely empirical models, the methodology deprives developers of a class much simpler, easier to understand models that can improve upon the basic formulae from Approach 3 without adding abundant complexity. In the spirit of Occam's razor, we believe it is an error to exclude empirical models. It will favour complexity over simplicity, limit the number of providers that can meet the methodology's requirements, and stifle innovation. Beyond this, the exclusion of empirical models and addition of surrogate models seem to contradict each other. The first implies that empirical modelling doesn't work. At the same time, the use of process-based surrogate models sends the message that process-based models don't work and they require a layer of empirical modelling.	
237	Indigo Ag	Footnote 15 states "Where Quantification Approach 1 is used, the SOC pool must be modelled." This is huge! If I am correct that this	Demonstrating that farmers have been provided training and agronomic guidance in the appropriate depth and duration for AWD for their given area is required. Training alone is not sufficient to demonstrate AWD was actually employed in a given project. It will be the

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		footnote is saying that SOC may only be excluded where the project quantification relies entirely on direct measurement and/or default emission factors, then this should be made clear much earlier in the document (and not in a footnote). Perhaps it is and I missed it? In addition, this appears to directly contradict Table 1, which specifies that SOC is excluded, and footnote 3 from Table 1, which specifies that VM0042 must be used for SOC quantification.	responsibility of each project proponent to determine what data is sufficient to meet the Monitoring, Reporting and Verification requirements of the methodology, following the guidance throughout the methodology, including Box 1. It will then be the role of the VVB to determine if such MRV efforts are reasonable and sufficient to meet methodology requirements, in the given circumstances.
238	Indigo Ag	It is surprising to see that this methodology allows for the use of default emission factors for quantification of the primary activities / GHG impacts (soil methanogenesis) for projects of any scale. Also, it seems counterintuitive that small projects are allowed to use global/national EFs, since the uncertainty / inaccuracy would be expected to be inversely proportional to the scale of the project (e.g., a national emission factor is much more accurate for a project spanning a million ha than it would be on a single farm). We suggest reconsidering this approach to avoid opening the floodgates to generation of low quality credits.	Thanks for the feedback. The methodology allows the use of Tier 1 (Global or Regional) EFs for projects with a capacity limit equal to or less than 60000 t CO2e. Refer to subsection 8.1 for more details on the use of EFs.
239	Indigo Ag	Footnote 17 states "Initial measurements of SOC may be conducted at t = 0 or (back-) modelled to t = 0 from measurements collected	Thank you for your comment. Please note that the methodology mainly defers to modelling requirements in VM0042 and VMD0053. Thus, additional guidance has been added to footnote 14. A VVB must assess any

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		within ± 5 years of t = 0." In practice this is not always feasible. However, it would generally be conservative to use a SOC value taken some years after t = 0 without adjustment, so long as the project is confident that the project activities will have a positive impact on SOC flux. We suggest allowing for use of later soil samples without the requirement for back modelling.	methodology deviation.
240	Indigo Ag	It appears that liming should have an "X" in some additional columns in Table 4. Section 8.2.2 makes it sound like it's possible to use a model for CO2 emissions from liming.	Thank you for your comment. Table 4 summarizes quantification approaches and does not replace more detailed guidance elsewhere in the methodology. Thus, QA1 may be used for liming emission calculations as well, as shown in subsection 8.2.2.
241	Indigo Ag	Section 8.1, page 18 states that "Direct measurement is used to quantify flux in CH4 emissions for both baseline and project conditions…Flux in all other trace GHGs (such as N2O from soils, CO2 from energy usage, and combustion emissions related to avoided biomass burning) must be accounted for using the default emission factor approach." However, the first sentence in Section 8.5.2 page 40 states that "Quantification Approach 2 is applicable for flux of CH4 and optionally also N2O". These statements appear to be in conflict with each other. We recommend clarifying whether Quantification approach 2 can be	Thank you for your comment. QA 2 is only available for CH4 direct measurements. We have updated the guidance throughout the methodology to reflect this.

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		used for N2O emissions, and to revise any conflicting statements. If direct measurement is allowed for N2O, we also recommend updating Figure 1 and Section 8.6.2.	
242	Indigo Ag	We recommend moving this Section to either be next to Section 9.1 or as a new appendix. The methods outlined in Section 8.2.6 apply to both the baseline and project scenario, but Section 8.2 is specific to the baseline. This may cause confusion. Moving the content of Section 8.2.6 to Section 9.1 or an appendix could help to clarify the document.	Thanks for the feedback. The methodology has been revised accordingly.
243	Indigo Ag	Section 8.2.6 states that "[t]he direct measurement of methane emissions is to be undertaken using chamber measurements pursuant to the requirements and guidance in Section 9.1, and following the guidance in this section." Does this exclude eddy covariance towers, and would it make sense to include that as a measurement option?	Thank you for the comment. The methodology only allows for direct CH4 flux measurements using chamber measurements.
244	Indigo Ag	Page 45 states "For projects using Quantification Approach 2, the values in Equation (36) for ΔCH4_soilt must be set using Section 8.2.1." However, we believe this should reference Section 8.2.6, not Section 8.2.1.	Thank you for your comment. The text has been updated accordingly.
245	Indigo Ag	We agree that it is important to account for	Thank you for your comment. The methodology has

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		increased N2O emissions when changing from continuous flooding to AWD or other irrigation practices that intersperse flooding with dry-down events. However, applying the deduction factor in Eq. (35) on page 44 appears to over-penalize reduced irrigation practices. This is because the increased N2O emissions from reduced irrigation relative to continuous flooding is already by taken into account by ΔN2O_soilt in Eq. (35), so subtracting PERed-Irri,t in Eq. (35) would account for this increase in emissions twice. In addition, it is unclear how the correction factor of 0.00314 was computed. Footnote 25 on page 34 states that the correction factor was derived from the Table in Appendix 3 (note this should be a reference to Appendix 2, not 3), but the Appendix is missing emission factors for "continuous flooding" and "single and multiple drainage". Referring to the source of the data in that Appendix (Table 11.1 (Updated) in Chapter 11, Volume 4 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories), the default emissions factors are 0.003 for continuous flooding and 0.005 for single and multiple drainage. This would give a difference in emission factors of 0.005 - 0.003 = 0.002, not 0.00314. We recommend that the methodology be revised so that this increase in N2O	been revised to correct the errors and with respect to how the 0.00314 correction factor was created; please refer to Appendix 3 for further details on the calculations.

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		emissions is accounted for only once. If the correction factor is needed, we recommend clarifying how it was derived.	
246	Indigo Ag	The formatting of variables and parameters is inconsistent, with some in plain text and others in mathematical font, sometimes with both mixed in the same parameter. We suggest making this consistent throughout the document.	Thanks for the feedback. The methodology has been revised accordingly.
247	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	We would recommend that the guidance on direct monitoring of emissions encapsulates the ability to include emerging monitoring technologies such as flux measurements and gives the project developer to use other direct measurement technologies that provide the same, or better level of detail and certainty as the chamber method prevailing throughout the methodology. The onus should be on the developer to ensure any new methodology has been scientifically, technologically and statistically vetted to the needs of the methodology.	Thank you for your comment. The requirements for using GCs equipped with FID will be maintained, as they represent conventional best practices. For guidance on direct chamber measurements, refer to Appendix 2.
248	Grow Indigo Pvt Ltd	Since rice is a water intensive crop, it would be an added advantage if Verra rice methodology could be leveraged to quantify and certify water savings through adoption of regenerative agriculture in rice cultivation (such as DSR/AWD/IWD) for financial incentives?	Thank you for your comment. The VCS Program supports crediting for carbon benefits. However, Verra does run two non-carbon benefit programs and allows for (and requires) VCS Projects to report contributions to SDGs. Projects using the Verra rice methodology may also be validated under the CCB or SD VISta program to quantify non-carbon benefits. Given the example, SD VISta or utilisation of the SDG reporting would be most

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			appropriate.
249	Grow Indigo Pvt Ltd	What is the ideal sample size to be considered for data collection during the baseline scenario and Project scenario. Table 4 of VM0042 talks about minimum specifications on agricultural management practices only for the baseline scenario, but there is no clarity on the project scenario data collection (minimum requirements) and sample size (whether the data should be collected for all the farmers or the sampled farmers). The clarity to be provided.	Thanks for the feedback. The methodology has been revised accordingly. For minimum requirements on data collection, refer to Section 9 and the methodology text throughout.
250	Grow Indigo Pvt Ltd	Is it allowed to de minis SOC and not claim credits as per this new rice methodology?	Thanks for the feedback. The methodology allows crediting for emissions reductions only; it does not include emissions removals (i.e., SOC stock increase). For a safeguard to prevent the implementation of project activity that could result in SOC losses, refer to section 4 guidance.
251	Grow Indigo Pvt Ltd	We would also like to propose the possibility to develop and employ empirical models for CH4 quantification. The use of empirical models for quantifying methane emissions from rice fields is advantageous due to their data-driven accuracy, adaptability to local conditions, cost-effectiveness, and ease of implementation. These models rely on real-world data, making them reliable and relevant for specific regions. They are also simpler and more economical compared to complex	Thanks for the feedback. The methodology has been revised. Note that, under QA1, modelling guidance from VM0042/VMD0053 must be followed for empirical or process-based models.

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		mechanistic models.	
252	Ostrom Climate Solutions	N2O emissions from agricultural soils show large variations due to differences in the environment, crop cycles, and management (Lesschen et al. 2011). Despite the large variations in emissions, N2O direct soil emissions from agriculture are often estimated using the default Intergovernmental Panel on Climate Change (IPCC) emission factor (EF) of 1% of applied N (IPCC 2006). However, more intensive measurements are needed to get season-, site-, and crop-specific emissions factors. Site specific data should be preferred for estimating the N2O emissions for rice systems.N2O emissions should be able to be quantified using direct measurements as protocols for chamber measurements of GHG emissions in rice fields often combine analysis of CH4 and N2O (please see the guidance of Minamikawa et al., 2015, furthermore most of the peer-reviewed literature on GHG emissions in rice combines these protocols and reports both in the results). Chamber measurements provide direct and precise quantification of N2O emissions, which is crucial for accurately assessing the impacts of project activities such as AWD (Alternate Wetting and Drying) on greenhouse gas emissions. This method captures the spatial and temporal variations in emissions more effectively	Thank you for the comment. QA 2 is only available for CH4 direct measurements. We have updated the guidance throughout the methodology to reflect this. Regarding field measurement of N2O fluxes, due to the high complexity related to the spatial and temporal variability of N2O fluxes and measurement requirements, this approach remains cost-prohibited at the project level and a simpler measurement approach could result in under- or over-estimations of emission reductions.

Section 8 - Quantification of Estimated GHG Emission Reductions - Overall Section Feedback			
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		than indirect methods such as emissions factors, which have high degrees of uncertainty and in some cases might even underestimate N2O emissions if the project activities were not properly implemented. Using established scientific methods, such as chamber measurement, would enhance the credibility and acceptance of this methodology and aligns with best practices in environmental science and promoting a higher standard of methodological rigor. It could be costly for project developers to obtain licenses to suitable biogeochemical models, and emission factors have very high degrees of uncertainty. Furthermore, IPCC emission factors themselves have been derived from chamber measurement data; it is better to allow projects to use project-specific measurements as this captures local practices and conditions. Direct measurement of N2O must also be included as an option in the method of quantification especially if the GC used has both the FID and ECDectector since there will be no additional cost to measure the N2O with CH4. Site specific variations in N2O emissions brought about by seasonal variations, type and amount of N fertilizer, method and timing of N application, water level during the time of fertilizer application , rice varietal differences in N use efficiency, could be captured through direct measurements. The N2O-N per unit of fertilizer N emission factors were	

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		disaggregated only into continuous flooding and single or multiple drainage in IPCC2019. Katayanagi et al (2012) simulated N2O emissions under continuous flooding and AWD using DNDC and values were 89% and 29% lower than the directly measured values. As quoted from Katayanagi et al "Simulation of N2O fluxes by using the DNDC model or the DNDC-Rice model has been reported by Li et al. (2005), Babu et al. (2006), and Fumoto et al. (2010). Li et al. (2005) reported that the DNDC model was capable of estimating the seasonal magnitudes of N2O fluxes from paddy sites, although discrepancies existed for about 20% of their tested cases. Babu et al. (2006) also validated the model, by using data from Delhi and Ludhiana, India, and reported that the total observed and simulated seasonal N2O emissions were strongly correlated, although the daily fluxes revealed discrepancies and the simulated seasonal N2O emissions were 248% lower to 28.6% higher than the observed values. Fumoto et al. (2010) validated the DNDC-Rice model by using data from Japan; they reported that the simulated N2O emissions were 66% lower to 265% higher than the observed values" References: ___Agnes Tirol-Padre, Munmun Rai, Virender Kumar, Mahesh Gathala, Parbodh C. Sharma, Sheetal Sharma, Rakesh	

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		Kumar Nagar, Sandeep Deshwal, Love K. Singh, Hanuman S. Jat, Dinesh K. Sharma, Reiner Wassmann, Jagdish Ladha. 2016. Quantifying changes to the global warming potential of rice wheat systems with the adoption of conservation agriculture in northwestern India. Agriculture Ecosystems & Environment 219:125-137. DOI:10.1016/j.agee.2015.12.020 ___Furukawa, Y., Hasen, Y., Rodriquez, R., Agbisit, R., 2007. Effect of timing of N topdressing and irrigation on CH4 and N2O emissions under the AWD management. In: Hosen, Y. (Ed.), Annual Review and Planning Meeting. IRRI¬ Japan Project, International Rice Research Institute, Los Banos, Philippines, pp. 94-106 ___Katayanagi, N,, Furukawa, Y., Fumoto, T,, Hosen, Y., 2012. Validation of the DNDC¬ Rice model by using CH_4 and N_20 flux data from rice cultivated in pots under alternate wetting and drying irrigation management. Soil Science and Plant Nutrition · June 2012 DOI: 10.1080/00380768.2012.682955 ___Li C, Frolking S, Xiao X, Moor III B, Boles S, Qiu J, Huang Y, Salas W, Sass R 2005: Modeling impacts of farming management alternatives on CO2, CH4 , and N2O emissions: a case study for water management of rice agriculture of China. Global Biogeochem. Cyc., 19, GB3010. ___Babu YJ, Li C, Frolking S, Nayak DR, Adhya TK 2006: Field validation of DNDC model for methane and nitrous oxide	

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		emissions from rice-based production systems of India. Nutr. Cycl. Agroecosyst., 74, 157–174. ___Fumoto T, Yanagihara T, Saito T, Yagi K 2010: Assessment of the methane mitigation potentials of alternative water regimes in rice fields using a process-based biogeochemistry model. Global Change Biol., 16, 1847–1859. Lesschen JP, Velthof GL, Vries WD, Kros J (2011) Differentiation of nitrous oxide emission factors for agricultural soils. Environ Pollut 159:3215–3222 Minamikawa, K, Tokida T, Sudo S, Padre A, Yagi, K 2015: guidelines for measuring ch4 and n2o emissions from rice paddies by a manually operated closed chamber method. national institute for agro-environmental sciences, tsukuba, Japan.	
253	TotalEnergies Nature Based Solutions	We welcome the inclusion of N2O emissions in the GHG sources. However, we would support the quantification of N2O emissions using gas chamber under quantification approach 2. It is not clear to us what the rational for a default value approach is in that case. In our view, gas chamber measurement would significantly increase the robustness and conservativeness of this quantification approach at a marginally higher cost.	Thank you for your comment. Verra has determined that QA2 will apply only to CH4 measurements. We have updated the guidance throughout the methodology to reflect this. Field N2O flux measurements are very complex and costly due to their spatial and temporal variability. Therefore, the methodology conservatively does not allow those measurements since they remain cost-prohibit, and a simpler measurement approach could result in under- or over-estimations of emission reductions.

Section 8 - Quantification of Estimated GHG Emission Reductions - Overall Section Feedback			
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254	TotalEnergies Nature Based Solutions	We would welcome clarifications on whether a true up of SOC every 5 years is required, as per VM0042 requirements (Section 8.3,Table 8 and Section 8.6.1.3), and if this procedure should be extended to CH4 and N2O emissions to improve the conservativeness of QA1.	Thank you for your comment. Please note that the methodology defers to requirements in VM0042 and VMD0053 with respect to modelling, including modelling emissions of CH4 and N2O. The methodology does not require a true-up of the model at 5 years. However, at the crediting period renewal, the validity of the baseline must be reassessed, and soil sampling and new model parametrization, calibration, and validation are required.
255	VGS	Table 4 : Agro-forestry need to be included as optional carbon pool for quantification of GHGs reduction in the project boundary	Thanks for the feedback. Agroforestry projects could use VM0042.
256	VGS	Quantification approach 4 : Local Agricultural University approaches if available with proper scientific backup, can be considered as an optional model or one of the alternative quantification approach	Thank you for your comment. Only the 3 QAs listed in the methodology may be used. Local agricultural Universities may nonetheless play a critical role in project implementation, including for stakeholder engagement, farmer training, data capture. Universities may also be a valid source of project data, for instance under category (4) listed in Box 1.
257	VGS	GHGs emission reduction by Agro-forestry system need to be included as optional carbon pool for quantification of GHGs reduction in the project boundary in project emissions reductions	Thanks for the feedback. Agroforestry projects could use VM0042.

Section 8.1 - Summary

Section 8.1 - Summary			
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258	University of Uppsala	The criteria/rationale for switching between different quantification approaches should be laid out explicitly, especially, since this option could lead to preferential/non-conservative deliberate choices being made to support the case. As a validator, this has been the highest pain point where better data is available, some project proponents tend to use the data that suits the case being made rather than making objective choices. This could lead to artificial ER estimates.	Thanks for the feedback. The methodology has three quantification approaches and safeguards to prevent a non-objective choice for a QA. As per methodology guidance, PP may employ multiple QA provided that the same approach is used for both the project and baseline scenarios for the given GHG source within the given monitoring period.
259	String Bio	Current Clause Page 18: Flux in all other trace GHGs (such as N2O from soils, CO2 from energy usage, and combustion emissions related to avoided biomass burning) must be accounted for using the default emission factor approach. Page 31: Quantification Approach 2 is applicable only to fluxes of CH4 from soil methanogenesis. Feedback N2O emissions are a key GHG impact from Rice Fields . On an average, the annual global N2O are reported to be 1.7 kg/ha	Thank you for your comment. QA 2 is only available for CH4 direct measurements. Projects implementing methanotrophs must adopt QA2, and N2O emissions are calculated under QA1 or QA3.

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		which yields 0.45 TCO2eq/ha value due to GWP value of 265. Currently, the methodology excluded N2O measurement using the direct measurement quantification approach which is restricting project developers to perform calculations for N2O reduction where emission factors are not available (For Eg: Methanotrophs). Certain irrigation based CH4 reduction practices like AWD and DSR lead to ~10-100% increase in N2O emissions (Miranda et al, 2015, Chaudary et al, 2023). This changes the total carbon offsets (CO2e) achieved from a project activity. On the other hand, Methanotroph application has demonstrated up to 40% decrease in N2O flux from rice fields due to improved nitrogen use efficiency. On top of this, additional N2O reduction can be obtained by also reducing fertilizer application rate. For more accurate and robust Carbon Offset calculations from a given project rice field, the inclusion of N2O emissions is important. For new practices like use of methanotrophs, emission factors are not available. The current gap in quantification does not capture their full potential in achieving GHG abatement and restricts their further development and adoption as sustainable practices. It should be noted that Quantification Approach 1 (BGC Model), and	

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		Quantification Approach 3 (Emission Factor) offer means to account for N2O that are all derived using chamber measurements for N2O. The data being used to calibrate and validate BGC models for N2O comes from GC chamber measurements of N2O, as well as the data underlying the IPCC emission factors for N2O. While the methodology allows this data, it is restricting project-specific robust measurements for N2O using the same chamber measurement techniques. This goes against the best practices which encourage Tier 3 data capture wherever possible. The literature supporting CH4 chamber measurements typically also includes clear guidance for N2O measurements. Sufficient methodologies and equipment exist for N2O chamber measurements, and such measurements are common amongst the scientific research community. Given that direct close chamber measurement of CH4 is already within scope, N2O can be easily measured in similar manner without additional cost/infrastructure requirement/resources	
260	CarbonFarm Technology	There seems to be an inconsistency concerning the applicability of Approach 2: Direct Measurement to nitrous oxide emissions. In one location it is mentioned as optional. In many other locations it is excluded.	Thank you for the comment. QA 2 is only available for CH4 direct measurements. We have updated the guidance throughout the methodology to reflect this. Regarding field measurement of N2O fluxes, due to the high complexity related to the spatial and temporal variability of N2O fluxes and measurement requirements,

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		In the spirit of reducing risk of over crediting, we believe that it would be beneficial to keep direct measurement as an option for measuring nitrous oxide emissions. For one, certain chamber measurement systems allow to measure both methane and nitrous oxide at no extra cost. Furthermore, we foresee certain informed buyers preferring this option on larger projects. Given previous concerns about insufficient accounting for nitrous oxide emissions, adding the option of direct measurement could only be beneficial.	this approach remains cost-prohibited at the project level and a simpler measurement approach could result in under- or over-estimations of emission reductions.
261	Arva Intelligence	Table 4 and Quantitative Approach 1 in page 18 requires model domain to cover SOC, CH4, and N2O, but there is insufficient studies available to validate a model for SOC, CH4, and N2O together.	Thank you for your comment. This methodology defers largely to VM0042 and VMD0053 with respect to modelling requirements. While some models have already been sufficiently calibrated and validated for rice systems across multiple countries/regions, PPs may choose QA2 or QA3 for GHG quantifications if there is no suitable model applicable to the project area.
262	Arva Intelligence	Regarding the N2O flux for the model domain, additional clarity on what is and what is not required would be helpful.	Thank you for your comment. Please note that the intent is to defer to requirements in VM0042 and VMD0053 with respect to modelling.
263	Ostrom Climate Solutions	N2O should be able to be quantified using direct measurement as this is well accepted in the literature for GHG emissions in rice and N2O emissions measurements are commonly combined with CH4. Direct measurements will	Thank you for the feedback. Based on external expert consultations, field measurements are very complex and costly due to the spatial and temporal variability of N2O fluxes. Therefore, the methodology conservatively does not allow those measurements since it remains cost-prohibit and a simpler measurement approach could

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		provide lower uncertainty than emission factors. If measuring N2O with chamber measurements, the gas chromatograph must be equipped with electron capture detector (ECD).	result in under- or over-estimations of emission reductions.
264	AgriCapture, Inc	Under Quantification Approach 3, the draft methodology cites that developers should use default emissions factors and equations from the 2019 Refinement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories. We recommend that the methodology be updated to either allow for the 2024 refinement of IPCC guidance or to reference "the most recent update to IPCC guidance." This will allow developers to utilize the most current scientific understanding for emission factors and quantification approaches. If the 2024 refinement is utilized, a change would also need to be made for equations utilizing soil organic amendments. The new guidance includes more specification in regards to soil texture and regional baselines (California vs Southeast US), rather than national.	Thanks for the feedback. The methodology has been updated, and it advises using the most recent version of the IPCC guidelines. For detailed guidance, refer to the data and parameters tables in Section 9.

Section 8.2 - Baseline Emissions

Section 8.2 - Baseline Emissions			
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265	Anonymous	In 8.2 Baseline Emissions / Quantification Approach 2: Direct Measurements, it says 'Projects must use baseline control sites linked to one or more quantification units to derive requisite data', whereas in Section 6 Baseline it says 'For Quantification Approach 2, at least one baseline control site is required per stratum, as set out in Section 9.1.' We feel this is confusing, and the statement in 8.2 is incorrect. We think control sites are required per strata and not per quantification unit.	Thanks for the feedback. The methodology guidance has been revised accordingly, and further guidance on project area stratification and direct measurement procedures, plus new definition terms, have been added. Refer to Appendixes 1 and 2 and Section 3.
266	Anonymous	"Where using a single season emission factor in double cropping systems, the emission factor must only be used for the corresponding season (e.g., the first season emission factor must not be used for second season rice cultivation)." Whether the project developer need to measure/ calculate the GHG flux/ emission factors separately for wet and dry season in a double rice cropping system in a given year? Does that also mean the season wise emission factor once generated could be continued throughout the project lifetime?	Thank you for your comment. Please note the guidance has been updated to make it clear that chamber measurements are required for every season when applying QA2.
267	University of Uppsala	Section 8.2.6: For aggregating hourly CH4 flux data to season, the current approach ignores diurnal dynamics of CH4 emissions, especially when the emissions	Thank you for your comment. The methodology adopts approved international GHG protocols with best practices for GHG measurement in rice systems. It recommends mid-late morning measurements at a weekly basis during

Section 8.2 - Baseline Emissions			
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		are high during the later part of the crop developmental stages (e.g., See Kajiura and Tokida et al., 2023 10.1002/jeq2.20553). Thus, the risk of overestimation is high. It is advisable to include a diurnal scaling factor with diurnal measurement (every 2h through the day and night) at least during the mid- to late-crop development stage (Booting stage and later). In the absence of this, the emission reductions would be inaccurate, and possibly overestimated.	the cultivation season.
268	CarbonFarm Technology	The season duration is defined on page 29. Could we please have some added clarification for the start and end events: - what defines the start of land preparation? Is this the first flood of the field to moisten the soil? - what is the post-season drainage? Is this the drainage that occurs prior to harvest?	Thanks for the feedback. We revised the methodology and definition terms list to improve clarity; refer to Section 3 for further details.
269	CarbonFarm Technology	It is clear from the methodology that the project practices can include a single or multiple drainages. It is less clear as to what is expected of the baseline practices. Many examples refer to continuous flooding however the reality is that, in many regions, farmers already employ some level of drainages. We would like to recommend two additions: - an explicit comment that the methodology	Thank you for your comment. The guidance in Section 6 has been updated to the following: "This methodology considers multiple baseline scenarios, all of which are founded on an assessment of pre-project rice management practices, in particular on-season water regime management. For each project field, the baseline scenario is derived from practices implemented in the (minimum three-year) historical look-back period, creating an annual schedule of activities to be repeated throughout the baseline scenario and used to estimate baseline emissions and net project emission reductions during each monitoring period. Baseline emissions are

Section 8.2 - Baseline Emissions			
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		may apply to farmers already performing some level of drainages under the condition that extent of drainages improve (e.g. adding additional drainage events during the season, earlier pre-harvest drainage, longer/deeper drainage events, extended mid-season drainage) - a mention that approaches 1 and 2 should reflect existing irrigation practices and not continuous flooding unless farmers are implementing no form of soil drainage	modelled (QA1), directly measured for soil methanogenesis only (QA2), and/or estimated using default emission factors (QA3)."
270	Olam Agri Pte Ltd	With reference to Quantification Approach 1 in Quantification of Estimated GHG Emission Reductions (Section 8.2), "An acceptable model is used to estimate GHG flux based on soil characteristics" Is there a review of soil types and their permeability play in this model to set boundary conditions of model selection?	Thank you for your comment. Please note that the intent is to defer to requirements in VM0042 and VMD0053 with respect to modelling, and initial SOC sampling is required as model input data for model initialization.
271	Grow Indigo Pvt Ltd	To enhance the understanding of the newly introduced "Greenfield" option/concept, it would be beneficial to provide a detailed method for calculating baseline emissions as part of developing this methodology. For example, in a scenario where a 4-acre plot previously used for vegetable cultivation is converted into a rice field based on expert agronomic advice, a clear explanation of the steps to develop the baseline for this specific transition would be valuable.	Thank you for your comment. Please note the 'greenfield' option has been removed from the methodology. Greenfield farms are not allowed under this methodology.

Section 8.3 - Project Emissions

Section 8.3 - Project Emissions			
#	Organization	Comment	Developer's Response
272	Regrow Ag	This section states, "1) All fields that employ reductions in rice straw burning must account for emissions associated with the alternative fate of the rice straw (using Equation (25) below)." Please clarify if this means an eligible intervention is to move from 100% straw residue burnt in the baseline to 100% straw residue removed in the project. In other words, can the emissions avoided due to the conversion from burning to removal be credited?	Thank you for your comment. As set out in Section 4 Applicability Conditions, emission reductions can be credited for avoiding biomass burning, and must also account the associated leakage emissions.
273	Regrow Ag	This section states, "2) All fields that employ changes in irrigation must account for N2O emissions associated with such changes by applying an N2O correction factor (using Equation (26) below)." Is an N2O correction factor required even when quantifying N2O emissions using QA1?	Thanks for the question. Under QA 1 modelling - if the model chosen estimates N2O fluxes due to the implementation of irrigation changes, then there is no need to apply a correction factor, avoiding double-counting.
274	University of Uppsala	Section 8.3.3: Allowing subsequent reduction in N2O emission due to reduction in fertiliser production is although welcome, this could again lead to overcounting unless data from various levels - especially regional, state or national levels reflect this. Fertiliser production has never seen a significant decline in the past few decades	Thank you for your comment. Please note that the option to be credited for reductions in emissions related to upstream fertilizer production has been removed from the methodology.

Section 8.3 - Project Emissions			
#	Organization	Comment	Developer's Response
		and future projections only project a steep increase. Thus, this could lead to artificial ER counting. Validating such claims could also become problematic in comparing global/national/regional trends with data the project proponents could produce to utilise this provision. There is also a risk that such claims (albeit challenging to quantify) could be larger than the leakage emissions.	
275	CarbonFarm Technology	The EF for straw as animal feed refers to VM0042 sections 8.2.7 and 8.2.10. These sections outline how to calculate emissions from manure however there doesn't seem to be any guidance for the enteric fermentation emissions that I understand to be significantly greater. Is this part missing a reference to VM0041?	Thanks for the feedback. The methodology has been revised, and guidance for calculating EF for straw as animal feed has been updated; refer to the guidance on data and parameter tables in Section 9.
276	Indigo Ag	We suggest removing the option to account for avoided upstream ("embedded") emissions related to reduced fertilizer application. There are two reasons why this source should be excluded: 1. Realness. It is unreasonable to conclude that the small-scale reduction in nitrogen fertilizer use on the scale of a field, or even one carbon project, will reduce production of nitrogen fertilizers and lead to a reduction in associated GHG emissions. In reality, that fertilizer will still be produced and just used elsewhere (i.e., leakage). This is different from inventory accounting, where the emissions will be accounted for	Thank you for your comment. Verra released an update in August 2023 to provide guidance for methodologies that include upstream displacement activities. These activities are defined as "a project activity that reduces GHG emissions upstream of where the project activity is implemented, such as through product substitution, fuel switching, decreased demand for a given activity, product, or service, or other forms of displacement." As part of this update, methodologies must provide evidence of one-to-one displacement between the downstream intervention and the upstream impact. Without this evidence, methodologies must provide an upstream displacement discount factor, based on peer-reviewed literature or a market analysis of supply and demand elasticities.

Section 8.3 - Project Emissions			
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		in someone else's inventory. In that case it's not about emission reduction, but rather just proper allocation of emissions through a supply chain. 2. Ownership. If one could establish a causal link between the reduction in fertilizer application in the project and real reduction in emissions related to fertilizer production, it is still not possible to establish ownership over those reductions. The significant sources of emissions in fertilizer production are also subject to some amount of regulation in developed nations, leading to a potential issue of double counting.	Considering the complexities you raised related to fertilizer supply chains and the fact that this optional source of emission reductions represents a minor pool in the methodology, we have elected to remove this pathway. We appreciate your input.
277	International Rice Research Institute	Remove "or field incorporation" from the title of Table 5	Thank you for your comment. The Table 5 title has been updated accordingly.
278	Ostrom Climate Solutions	Direct measurement should be allowed for N2O measurements (see above comments).	Thank you for the feedback. Based on external expert consultations, field measurements are very complex and costly due to the spatial and temporal variability of N2O fluxes. Therefore, the methodology conservatively does not allow those measurements since it remains cost-prohibit and a simpler measurement approach could result in under- or over-estimations of emission reductions.

Section 8.4 - Leakage Emissions

Section 8.4 - Leakage Emissions			
#	Organization	Comment	Developer's Response
279	Mantle Labs	Remote sensing could be used to determine rice yields, both historically during the baseline period and during the project monitoring phase to identify any drop in yield % below the 5% threshold and associated leakages	Thank you for your comment. Please note that projects are free to determine the most appropriate means to monitoring and demonstrate critical parameters for their project. It will be the role of the VVB to determine if the given means to monitor and demonstrate project activities is acceptable in given circumstances.
280	University of Uppsala	Section 8.4.2:It might be important to mention the case of unforeseen crop pest or disease incidences that could affect the yields and how to quantify and account for it.	Thank you for your comment. The guidance in Section 8.4.2 has been revised and allows for projects to demonstrate that pests, present not just in the project but regionally, were the cause of material yield declines.
281	Grow Indigo Pvt Ltd	Can grower information (farmer attested survey datasets-every cropping season) on yield or remote sensing based yield data can be used to calculate leakage?	Thank you for your comment. Per the guidance in Section 8.4.2, it may be possible to only use yield data derived from project farms to determine leakage. Remote sensing data may be used as auxiliary data pending VVB assessment and approval.
282	Arva Intelligence	We have concerns over the leakage from yield declines taken after the first monitoring period, as yield losses for the first 1-3 years are common with the adoption of regenerative practices.	Thank you for the feedback. The leakage requirements were adopted from VM0042, which has been through multiple rounds of development, including public consultations. We therefore consider those requirements to represent best practices. Please also note that we reviewed peer reviewed literature demonstrating expected positive impacts on yield associated with some of the eligible practices.
283	Mantle Labs	excluding years with extreme weather events". The definition of 'extreme weather' events is vague and invites interpretation. Rather, if there is a year with 'extreme	Thank you for your comment. In such cases, project proponents must provide evidence of "extreme weather events," which will ultimately be assessed by a VVB.

Section 8.4 - Leakage Emissions			
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		weather events', project rice yields should be compared to surrounding non-project fields and the drop in yield % due to weather should be shown to be comparable in order to have the yield reduction excused.	

Section 8.5 - Uncertainty

Section 8.5 - Uncertainty			
#	Organization	Comment	Developer's Response
284	Regrow Ag	We have noted all quantification approaches have different uncertainty approaches. we see value in uncertainty being comparable between uncertainty approaches and believe the level of conservativeness should at least be similar across all tiers	Thank you for your comment. The current variable approaches to uncertainty were developed in consultation with many stakeholders and are fully aligned with the VCS Program rules and requirements, the principle of conservativeness is applied in all cases.
285	Anonymous	Equation 35 – emission factors have to be used for liming, fossil fuels and N20/CH4 from burning. It says in 8.5.3 Quantification Approach 3, that 'Project proponents using global, regional, or national IPCC Tier 1 and Tier 1a emission factors must apply a standardized default uncertainty deduction of 15%'. This doesn't seem the be embedded in formula 35, or in the relevant	Thanks for the feedback. The methodology guidance has been revised, and the equations have been updated. For detailed guidance on uncertainty calculation under QA3, refer to subsection 8.6.3.

Section 8.5 - Uncertainty			
#	Organization	Comment	Developer's Response
		formulas in section 8.2. Overall, unclear how/when projects should apply the 15% uncertainty deduction required for parameters using national/global emission factors.	
286	University of Uppsala	Section 8.5.2: Measurement error is considered negligible. This is problematic. Determination of the baseline - necessitates looking back at surveys at the farmer-plot level. This is good. This could however be challenging and cumbersome for smallholder farming systems across the globe. The inclusion of approaches such as sample surveys across the stratified project area could help here.	Thanks for the feedback. The methodology has been revised accordingly, including guidance for using sample surveys; refer to subsection 9.3.1.
287	CarbonFarm Technology	It is our experience that satellite monitoring leads to lower calculated emissions reductions than self-reported log books. While this may seem logical, we are concerned that this may force developers to choose between greater transparency and a greater number of credits. In the interest of encouraging transparency, we would welcome the introduction of monitoring uncertainty in the calculation of the uncertainty deduction in equation 34. In the same way that this uncertainty deduction may encourage project developers to steer away from global emissions factors, we believe that including reporting uncertainty could encourage project developers to provide	Thank you for the constructive feedback. The methodology encourages using remote sensing tools in combination with in situ data collection to improve the accuracy and transparency of MRV systems. Ultimately, all project data must be assessed by a VVB, which will make the final decision on whether to approve project report data. Also, the methodology guidance on GHG quantification and data monitoring has been revised following PC feedback and external expert revisions. Please refer to sections 8 and 9 for more details.

Section 8.5 - Uncertainty			
#	Organization	Comment	Developer's Response
		greater transparency. One way this this could work is as follows. The variance of the estimate of mean emissions reductions could be calculated as the sum of the variance of the model estimate and the variance of the stratification estimate. The variance of the model estimate would continue to be calculated as in the draft methodology. The variance of the stratification estimate would be calculated in three steps: 1. estimate the variance of the number of hectares belonging to each stratum 2. for each stratum, multiple the estimate from (1) by the estimated emissions reduction for said stratum 3. sum the values from (2) across all strata For projects where self-reported log books are used as the only means to monitor practices, a default standard deviation of 15% of emission estimates could be applied as the stratification uncertainty. Finally, the uncertainty deduction could be then calculated as per usual using equation 34, substituting in the new variance of the estimate of mean reductions.	
288	Not Disclosed	Material Errors 5 and 6. P42 in Section 8.5.4 of M0253 refers to the following equaiton-34: (See figure 6.1	Thank you for the comment. The equation has been revised.

Section 8.5 - Uncertainty			
#	Organization	Comment	Developer's Response
		below this table) However, equation-34 is not consistent with the following two equations specified in section 2.4 of the VCS Methodology Requirements v4.4 (Material Error 5): (See figure 6.2 below this table) Therefore, equation-34 should be revised as follows: (see figure 6.3 below this table) In addition, the definition for Uncertainty in M0253 is also wrong (Material Error 6), Therefore, the definition for Uncertainty should be revised as follows: Half-width of the two-sided 90% confidence interval as a percentage of the mean estimate; %	

Section 8.6 - Estimated GHG Emission Reductions

Section 8.6 - Estimated GHG Emission Reductions			
#	Organization	Comment	Developer's Response
289	String Bio	Current Clause The stratification methodology must follow the guidance in Section 6 and Table 3. Each project must have a minimum of three	Thank you for your comment. Following a further literature review, including the referenced citation and discussion with independent experts, the guidance has been amended as follows: " A project must have at least three baseline control sites and three sample units per

Section 8.6 - Estimated GHG Emission Reductions			
#	Organization	Comment	Developer's Response
		sample locations per stratum for project fields and at least one baseline control site per stratum, and a minimum of three measurements per deployment (i.e., at least three chambers must be used per sample location, or chambers may be moved around), per sample location. Feedback Three sampling measurements per deployment would not provide any further accuracy on data given that we are already deploying three chambers/acre. It is a case of diminishing returns. This was also demonstrated in the MISRA Chamber Method Guidelines (Japan, 2015). Katayanagi and Tokida analysed the effect of the number of gas samplings on the precision of the flux calculation by using a Monte Carlo simulation. Above guideline suggest that increasing the number of samplings could increase the precision of the flux calculation, but the degree of improvement is rather limited. For instance, there is no significant difference between 2 and 3 samples (refer table provided). Further, the logistics and analysis of these samples, will add to the costs of the project without significant measurement difference. In addition, this will not be scalable to analyse huge number of samples from different locations. A 30 min direct sampling will give the data of gas released	stratum..." Refer to Appendix 2 for further guidance on CH4 direct measurements.

Section 8.6 - Estimated GHG Emission Reductions			
#	Organization	Comment	Developer's Response
		by the plant or soil (in case of N2O). This will be far more effective than collecting multiple samples to arrive at the same data. Data References: 1. https://www.naro.affrc.go.jp/archive/niaes/techdoc/mirsa_guidelines.pdf	
290	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Quantification Approach 3: This approach should introduce an emission factor for the calculation of project emissions, without using the baseline emission factor for continuously flooded fields without organic input. We propose adding the option to use new project emissions factor EFp,i, t for showing the results of project activity with only the use of methanotrophs.	Thanks for the feedback. Projects implementing the use of methanotrophs must follow QA2 - direct measurements.

Section 9 – Monitoring – Overall Section Feedback

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
291	Regrow Ag	This section states, "Box 1 below provides guidance with respect to best practices for sourcing data for projects. Where possible,	Thank you for your comment. Ultimately, the VVB will assess whether a particular data source is sufficient for the given circumstances, following VM0051 guidance

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
		project proponents should employ digital monitoring, reporting, and verification (dMRV) tools – in particular remote sensing – to enable efficient third-party validation and verification of project data." It is not clear if Box 1 data sources can be used as guidance for monitoring data. If not, we propose that an eligible data source for monitoring data be farmer-representative collected data, which is supported by farmer attestations.	and requirements. For guidance on data sources, refer to Box 1 and guidance from Section 9 Monitoring.
292	Anonymous	Section 9, Monitoring: safeguarding Environment and Biodiversity, "Examples of potential negative environmental impacts of projects include potential harms to migratory birds associated with reductions in winter flooding and challenges associated with the introduction of genetically modified organisms.", Can project developer claim Biodiversity credit other than C credits in the same project under this methodology or same project can be parallelly register under other VERRA methodology to claim Biodiversity credit? Does it only consider macro flora or fauna? Any provision for net positive microbial diversity to claim biodiversity credits?	Thank you for your comment. Climate, Community, and Biodiversity Standards (CCB) and/or Sustainable Development Verified Impact Standard (SD Vista) certification labels can be applied to VCUs if units comply with the requirements from the following approved standards. Projects pursuing these labels must submit the required documentation to the Verra Registry.
293	University of Uppsala	The need for draining the soil below 15 cm cannot be generalised. This could be achieved in well-drained soil whereas in systems that could take longer, and where	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage events has been replaced with the following: Each project must use persons with suitable qualifications

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
		the root length of the rice variety is used could lead to serious yield decline. To ensure aeration, a framework to quantify the optimal drainage depth for each stratum/rice variety is necessary. Setting a physical threshold of 15 cm drainage could lead to serious challenges for project implementers and farmers' livelihoods, especially in smallholder systems. Allowing a 3-year window for yield stabilisation is a well-thought-through and welcome move.	and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers, the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their field.
294	String Bio	Feedback Only Gas Chromatography is mandated as a valid method for gas measurement and analysis. The methodology should be open to upcoming technologies for gas measurement and analysis that may provide more accurate results in future with lower costs of implementation (for eg: Gas Sensors). Data Reference 1. https://www.mdpi.com/1424-8220/22/11/4141 2. https://www.nenvitech.com/products/catalyt	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
		ic-bead-sensors/ 3.https://www.techbriefs.com/component/content/article/48865-novel-technology-enhances-measurement-reliability-of-methane-gas-emissions-from-rice-paddy-fields	
295	NetZeroAg	The draft stipulates that "gas analysis must be undertaken using commercial gas chromatograph equipment, equipped with a flame ionization detector…". Why is the technological progress excluded per se? Laser-based sensors (e.g. from LICOR) offer much better detection limits and were shown to be suitable for direct measurements in the field. The methodology should be open to such innovations.	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.
296	Olam Agri Pte Ltd	With respect to Monitoring Section 9, (line 3) "The project proponent must provide training and technical support during the cropping season to deliver appropriate information and guidance in field preparation, irrigation, drainage, and use of fertilizer to the farmer. Such support must be documented in a verifiable manner at both validation and verification stages (e.g., training protocol and documentation of on-site visits)" (line 3). What type of monitoring, if any, is required in regards to attendance or other parameters of successful training of farmers, or is that assumed captured in the overall results	Thank you for your comment. The guidance in Section 9 that you site is intended to require robust training and guidance be provided to farmers. It is required (under VCS rules and this methodology) that appropriate training be made available to all farmers. It would be prudent for projects to capture data regarding attendance at trainings provided to farmers (and the broader stakeholder groups). Projects must ensure all project activities were implemented in accordance with the methodology, and that all mandatory monitoring requirements are undertaken. The methodology requirements are mirrored in the VCS requirements and as such the monitoring report provides guidance, reporting requirements, and clear monitoring

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
		reported in methane reduction?	requirements.
297	Indigo Ag	Page 47 states that "All qualitative information on ALM practices must be determined via consultation with, and substantiated with a signed attestation from, the farmer or landowner of the sample field during that period. Where the farmer or landowner is not able to provide qualitative information (e.g., a sample field is newly leased), the project proponent must follow the quantitative information hierarchy outlined below." However, the third source of evidence in the hierarchy is "A signed attestation from the farmer or landowner of the sample field during that period…". This is confusing, because if a signed attestation is not available as the preferred source of evidence, it is unclear how it could be available as a less preferred type of evidence. We recommend clarifying this guidance.	Thank you for your comment. The guidance has been updated to provide greater clarity.
298	Indigo Ag	The hierarchy described in Box 1 should be updated with a bit more nuance. Our suggested hierarchy for quantitative data sources is: 1. Measured data (including in-field sensors or meters, chambers, sampling, towers, machine data, and remote sensing) where values are automatically recorded. 2. Management records (ex post) 3. Management plans (ex ante) 4. Signed attestation from the grower,	Thank you for your comment. Verra released an update in August 2023 to provide guidance for methodologies that include upstream displacement activities. These activities are defined as "a project activity that reduces GHG emissions upstream of where the project activity is implemented, such as through product substitution, fuel switching, decreased demand for a given activity, product, or service, or other forms of displacement." As part of this update, methodologies must provide evidence of one-to-one displacement between the downstream intervention and the upstream impact.

Section 9 – Monitoring – Overall Section Feedback			
#	Organization	Comment	Developer's Response
		validated against reasonable agronomic values/ranges for that parameter. 5. Data extrapolated from other fields managed by the same grower, in the same area, with the same crop, and implementing the same practice changes. 6. Gap-filling with conservative, agronomically-appropriate values from literature, government publications, or experts.	Without this evidence, methodologies must provide an upstream displacement discount factor, based on peer-reviewed literature or a market analysis of supply and demand elasticities. Considering the complexities you raised related to fertilizer supply chains and the fact that this optional source of emission reductions represents a minor pool in the methodology, we have elected to remove this pathway. We appreciate your input.
299	International Rice Research Institute	Should not limit to gas chromatograph as there are other proven technologies such as LICOR that can also provide high quality detection of emissions and should be included.	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.
300	Grow Indigo Pvt Ltd	It would be good to specify a list of alternative methods for direct methane measurements, such as laser analyser, remote sensing, eddy covariance technique and others, in the option 2 approach (direct measurement).	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.

Section 9.1 - Monitoring Requirements for Quantification Approach 2

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
301	University of Uppsala	The second major critique is regarding the threshold of minimum 15cm drainage. This	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		in most cases eliminates project feasibility – even for cases where significant emission reduction is possible by draining soils to depths such as 10 or others. This in some ways defeats the purpose of the methodology by disallowing a spectrum of water management practices. I have commented in detail further on.	events has been replaced with the following: Each project must use persons with suitable qualifications and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers, the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their field.
302	University of Uppsala	Sample chambers could be moved - this is true and is necessary, however, it must be mentioned that the base frame that is set up to receive these portable sampling chambers should be fixed for the crop period and must be installed at least 2-3 days before sampling begins. This is a minor point. A major improvement that is required in the methodology is to incorporate the need to optimise the analytical protocol beyond the manufacturer's specification. This is especially important because method development that happens in the factory almost always uses pure gas mixtures and	Thank you for your comment. A new appendix 2 has been created which contains guidance for Quality Assurance/Quality Control for direct measurement of methane using flux chambers. We have included the following guidance, that each project must ensure their sampling and analysis protocol is optimized for sampling for rice systems, including any necessary adjustments for moisture and ambient concentrations of methane, and to require each project must report minimum detection levels, and ensure standard gas mixtures used to calibrate/validate their equipment spans the concentration ranges being detected. The guidance also provides links to the following two references: Optimisation of the gas chromatograph analytical protocol is detailed here: 10.1080/17583004.2015.1082233. &

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		almost all of them report relative standard deviation (RSD) using these pure gas standards. This could generate artificially low RSD but when analysing ambient air samples or headspace samples, these samples are generally containing high moisture and ambient concentration of O2. Both affect and RSD (of CH4 and N2O using FID and ECD - if not to the same extent). Secondly, the methods are often optimised for very high concentrations (often used for fume gas analysis) and may not be suitable for analysing relatively low-concentration fluxes from rice paddies. A caution for procuring a trace gas analyser that can measure ambient concentrations of CH4 and N2O and achieve an RSD of 2% or less using a homogenised ambient air mixture should be recommended. Optimisation of the gas chromatograph analytical protocol is detailed here: 10.1080/17583004.2015.1082233. Another good reference would be: https://www.ars.usda.gov/natural-resources-and-sustainable-agricultural-systems/soil-and-air/docs/gracenet-sampling-protocols/ In the absence of the above measures, the uncertainties and the combined (sampling and analysis) minimum detection limits of the protocol could be very large which could lead to artefactual overestimation or underestimation of the CH4 (as well as	https://www.ars.usda.gov/natural-resources-and-sustainable-agricultural-systems/soil-and-air/docs/gracenet-sampling-protocols/

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		N2O) fluxes.	
303	CarbonFarm Technology	Page 48 requires methane measurements to be taken using a flame ionization detection. There are, however, other means that are just as accurate, significantly cheaper and much more practical to use. One example is the LiCOR LI-7810 that uses a technology they call "optical feedback - cavity enhanced absorption spectroscopy". It allows for measures to be taken directly in the field without the need to send gas samples to a lab for analysis. Promoting this type of technology will surely allow developers to take more field measures and rely less on default emission factors.	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.
304	Olam Agri Pte Ltd	With reference to Monitoring Requirements for Quantification Approach 2 (Section 9.1), how might the requirement "All sampling must take place between 09:00 and 11:00 in the morning," I there (1) a requirement to ensure no disruption to farm field work (especially if the box is moved to satisfy three sites)? What are the monitoring data to ensure the sample was collected at this time (what documentation requirement is needed for the verification body to review)? How does the range in time impact the calculated error term, if at all (if half my samples are 9am and half are 11am, will that result in a larger or smaller error term)?	Thank you for your comment. Projects will have to determine the optimal implementation of methodology requirements and calculate associated errors/uncertainty following the guidance in Section 8.

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
305	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	As above	Thanks for the feedback. Projects implementing the use of methanotrophs must follow QA2 - direct measurements.
306	Ostrom Climate Solutions	If N2O emissions can be quantified using chamber measurements (see above comment), there should be a requirement that additional gas samplings should take place (e.g., 1, 3, 5 days) following N fertilizer application in order to capture temporal-high N2O fluxes (see guidance of Minamikawa et al., 2015).	Thank you for the comment. QA 2 is only available for CH4 direct measurements. We have updated the guidance throughout the methodology to reflect this. Regarding field measurement of N2O fluxes, due to the high complexity related to the spatial and temporal variability of N2O fluxes and measurement requirements, this approach remains cost-prohibited at the project level and a simpler measurement approach could result in under- or over-estimations of emission reductions.
307	Ostrom Climate Solutions	"Once direct measurements for CH4 are undertaken for one full season, they may be used for that same season for the duration of a 7-year crediting period, or for the first 5 years of a single 10-year crediting period." - THIS IS NOT RECOMMENDED as inter-annual changes in GHG emissions due to weather conditions, etc. will not be captured by carbon models in this case. The success of AWD implementation will greatly depend on weather (especially precipitation) and water availability, and thus emission reductions will be affected by annual changes in weather and precipitation. If projects are using direct measurements, they should be required to take measurements every season to establish the quantification of emission reductions in that season. Each season is distinct from	Thanks for the feedback. Please refer to the revised guidance on CH4 direct measurements in Appendix 2.

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		the next. This is not recommended because changes in weather (e.g., temperature and precipitation) between years can drastically alter GHG emissions outcomes. Projects should take measurements for every season which they are crediting if using quantification approach 2. I think allowing projects to use the same emission factor from only one season of measurements for the full crediting period will result in significant criticism of this methodology. Zhou et al. measured CH4 and N2O emissions over a 6-year period in experimental sites in a rice-wheat rotation and reported that CH4 and N2O emissions showed great seasonal and inter-annual variations along with those of temporal weather patterns because emissions were significantly correlated with soil temperature and soil moisture (floodwater depth in rice season) throughout the experimental period (Zhou et al., 2017). Kim et al., also reported that rain during the aeration period of fields utilizing mid-season drainage management can greatly impact the GHG emission outcomes, causing inter-annual variations in methane emissions (Kim et al., 2016). Specifically, they reported that in the growing season (from June to Oct.) methane emission during the three year study period ranged from 198 to 450 kg CH4 ha−1, showing significant interannual variability (Kim et al., 2016).	

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		Furthermore, the rice production system is one of the most climate change sensitive agro-ecosystems (Saud et al., 2022). The increasing frequency of high-temperature stress, heavy rainfall, drought, and flood disasters may significantly impact rice yields and GHG emission outcomes over time. On one hand, the higher amount of atmospheric carbon dioxide (CO2) levels improves photosynthesis, and stimulates the growth of rice plants, resulting in greater grain yields and potentially higher GHG emissions (Dar et al., 2024). On the other hand, extreme weather might negatively impact rice yields and resulting GHG emission outcomes. References Dar, A. A., Chen, Z., Rodríguez-Rodríguez, S., Haghighat, F., & González-Rosales, B. (2024). Assessing greenhouse gas emissions in Cuban agricultural soils: Implications for climate change and rice (Oryza sativa L.) production. Journal of Environmental Management, 353, 120088. Saud S, Wang D, Fahad S, Alharby HF, Bamagoos AA, Mjrashi A, Alabdallah NM, AlZahrani SS, AbdElgawad H, Adnan M, Sayyed RZ, Ali S, Hassan S. Comprehensive Impacts of Climate Change on Rice Production and Adaptive Strategies in China. Front Microbiol. 2022 Jun 30;13:926059. doi:	

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		10.3389/fmicb.2022.926059. PMID: 35875578; PMCID: PMC9300054. Zhou, M., Zhu, B., Wang, X., & Wang, Y. (2017). Long-term field measurements of annual methane and nitrous oxide emissions from a Chinese subtropical wheat-rice rotation system. Soil Biology and Biochemistry, 115, 21-34. Kim, Y., Talucder, M. S. A., Kang, M., Shim, K. M., Kang, N., & Kim, J. (2016). Interannual variations in methane emission from an irrigated rice paddy caused by rainfalls during the aeration period. Agriculture, Ecosystems & Environment, 223, 67-75.	
308	Ostrom Climate Solutions	Are there any requirements regarding the selection of project sample sites/sampling design (for example, VM0042 requires a random sampling design)?	Thanks for the feedback. The methodology guidance requires a random sampling design under QA2.
309	Ostrom Climate Solutions	Is the methodology going to categorically indicate minimum requirements on experience, education, etc for consultants, staff that will implement a project? E.g. training, actual experience in the aspects indicated i.e. establishment of sample fields for both baseline and project, gas sampling, etc and supervision of the GC lab, use of GCs and when necessary peer reviewed publications in this field/subject?	The methodology will not categorically indicate minimum requirements on experience, education etc, for staff contributing to the project. Each project will need to identify staff performing critical roles, and their level of experience / expertise. It will be the role of the VVB in the first instance to determine if project staffing is sufficient.

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
310	Ostrom Climate Solutions	Why is only one baseline site required?	Thank you for your comment. The guidance in Table 6 has been updated to stipulate that only one baseline control site is needed per strata and a minimum of three baseline sites per project. Refer to Appendixes 1 and 2 for detailed guidance on project area stratification and CH4 direct measurements.
311	Ostrom Climate Solutions	Number of baseline control sites - we noticed that there are conflicting statements in the minimum number of baseline control sites. In one statement, it says that at least one baseline control site per stratum is required but in Table 6: Summary of field direct measurement requirements (page 49) it says that sample locations per stratum require at least three for baseline sites. For statistical purposes, we recommend having the same number of baseline and control sites (minimum of 3).	Thanks for the feedback. The guidance in Table 6 has been updated to stipulate that only one baseline control site is needed per strata and a minimum of three baseline sites per project. Refer to Appendixes 1 and 2 for detailed guidance on project area stratification and CH4 direct measurements.
312	Ostrom Climate Solutions	Gas analysis must be undertaken using commercial gas chromatograph equipment - this may only be possible if commercial gas chromatograph service providers are available in the area and the unit has the appropriate analysers and calibrated to the correct minimum detection limit. In any case that there are no available service providers, the methodology should consider allowing project developers to establish their own laboratory to analyse their collected gas samples and may seek for third-party subject matter experts and reviewers to ensure the integrity of the	Thank you for your comment. The guidance in Section 9.1 has been updated to direct that project proponents must develop a detailed direct measurement plan for measuring CH4, informed by persons with suitable training and experience in undertaking such planning. Further guidance has been added that the sampling itself must be undertaken by persons with suitable training and experience in sampling. The methodology also already stipulates that the gas analysis must be undertaken by persons with suitable training and experience in such analysis.

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		results.	
313	Ostrom Climate Solutions	Is the methodology going to encourage or require project developers to seek for third-party subject matter experts and reviewers to ensure the integrity of the chamber measurement results? This is already the case for model calibration/validation results when using biogeochemical modelling but not for chamber measurement data.	Thanks for the feedback. The methodology encourages PPs to seek experts to ensure the robustness of direct gas chamber protocols and measurements; refer to Appendix 2 for detailed guidance.
314	TotalEnergies Nature Based Solutions	We would strongly support more stringent requirements regarding the number of years of measurements required to determine CH4 baseline/project emission factors for large projects using quantification approach 2. We would suggest a minimum of 3 years of measurements to reflect the impact of climate variability and align with international good practice guidance for CH4 and N2O emissions (Minamikawa, K. et al. 2015)	Thank you for your comment. Please note the guidance has been updated to require that chamber measurements be undertaken for every season for which QA2 is used.
315	Stanford University	Using the GC equipped with an FID sensor for methane gas analysis is the conventional method. However, this method is laborious, expensive, and provides single data points. Recent developments of instruments that can continuously record methane concentrations in the chambers will likely replace the conventional method in the future. Therefore, instead of specifying GC-	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.

Section 9.1 - Monitoring Requirements for Quantification Approach 2			
#	Organization	Comment	Developer's Response
		FID as the sole analytical technique, specifying the analytical parameters that the instrument should perform (e.g., sensitivity, precision, etc.) will allow novel techniques to be integrated.	
316	Mantle Labs	"Once direct measurements for CH4 are undertaken for one full season, they may be used for that same season for the duration of a 7-year crediting period". All field experiments show a large year-to-year variability of GHG fluxes, due to differing climatic conditions. Measurement of fluxes for a single season should not be accepted as representative for that same season across the next 5-7 years. Multi-year measurements for seasons should be mandated.	Thanks for the feedback. The methodology has been updated accordingly.

Section 9.2 - Data and Parameters Available at Validation

Section 9.2 - Data and Parameters Available at Validation			
#	Organization	Comment	Developer's Response
317	University of Uppsala	Restricting sampling from 9-11 could be problematic and may need to expand to 8 am to midday - this is because depending on the latitude, and temperature conditions, sampling may be done a bit early or later-	Thank you for your comment. A new appendix 2 has been created which contains guidance for Quality Assurance/Quality Control for direct measurement of methane using flux chambers. We have included the following guidance, that each project must ensure their

Section 9.2 - Data and Parameters Available at Validation			
#	Organization	Comment	Developer's Response
		especially if there are rains, sampling may not be possible if this is restricted to 3h window. Instead, a 5-hour window is advisable. Recommendation to keep the window tight to 2h fixed for a region could further tighten the purpose of this point (e.g., all sampling will be conducted between 8-10 am throughout the year is reasonable, whereas, for other places, 9-11 would be more suitable)	sampling and analysis protocol is optimized for sampling for rice systems, including any necessary adjustments for moisture and ambient concentrations of methane, and to require each project must report minimum detection levels, and ensure standard gas mixtures used to calibrate/validate their equipment spans the concentration ranges being detected. The guidance also provides links to the following two references: Optimisation of the gas chromatograph analytical protocol is detailed here: 10.1080/17583004.2015.1082233. & https://www.ars.usda.gov/natural-resources-and-sustainable-agricultural-systems/soil-and-air/docs/gracenet-sampling-protocols/
318	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	New EFp,i, t will be the emission factor for continuously would show the results of methanotrophs activity. The factor would be a) be pre-determined in the methodology based on current conservative scientific studies, or b) the project developer would have the option to refer to latest published and peer-reviewed studies on impacts of applications of methanotrophs.	Thanks for the feedback. Projects implementing the use of methanotrophs must follow QA2 - direct measurements.

Section 9.3 - Data and Parameters Monitored

Section 9.3 - Data and Parameters Monitored			
#	Organization	Comment	Developer's Response
319	Mantle Labs	Remote sensing can also help inform the cultivation period, from sowing to harvesting dates and should be included as a legitimate source of this data.	Thanks for the feedback.
320	Climate Wedge Ltd Oy and NewLeaf Symbiotics LLC	Monitoring will be necessary in terms of methanotrophs activity, either by quantity applied or by surface applied.	Thanks for the feedback. As per Section 4, PPs must ensure conformance with the most recent requirements of the VCS Program, including guidance on regulatory restrictions and environmental safeguards.

Appendix 1 - Guidance for Digital Monitoring, Reporting, and Verification (DMRV)

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#	Organization	Comment	Developer's Response
321	Regrow Ag	Request for greater clarification on what the DMRV guidance should validate. Should results validate if an intervention has been implemented, or should results validate specific monitoring data used for quantification (e.g., specific dates)? For example, if a field implementing AWD and declares 8 drains were conducted during an monitoring period, should DMRV procedures validate that 8 dry downs occurred during that monitoring period, or	Thank you for your comment. The guidance in the methodology for dMRV systems does not prescriptively direct how such technologies are to be used, but merely provides best practice guidance. Each dMRV system will have different capabilities, and thus deployment of such systems will need to be carefully considered in the context of the other data available to the given project.

Appendix 1 - Guidance for Digital Monitoring, Reporting, and Verification (DMRV)			
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		do the specific date declared and used as model parameters need to be verified (flood start date, flood end date, etc.)? We want to highlight that validation of specific monitoring data is challenging to achieve, especially when using remote sensing primarily due to satellite schedules. Therefore, we propose that validation should occur on an intervention basis rather than a specific monitoring data basis.	
322	Regrow Ag	We support the section stating, "Project proponents should validate ML/AI model results against independent ground truth data, using either cross-validation (preferably spatial rather than random) and/or independent holdout datasets." This approach enables a model's accuracy to be determined by what actually happened in the field rather than requirements set out by a third party (e.g., input data requirements, model type requirements, model validation approach requirements). Additionally, this promotes projects to keep up with model innovation over time.	Thanks for the feedback.
323	Regrow Ag	This section states "Project proponents should report on their feature set and explain how each feature is relevant to the task at hand. Such data may be marked as confidential, in which case it will not be made publicly available but will be available to the VVB and Verra."	Thank you for your comment. Please note that particular recommendation was intended to address concerns raised by stakeholders regarding the perception that AI/ML systems can be 'blackbox', and thus hard to verify and hard to trust. The guidance that multiple data sources be used to corroborate and cross-reference should help address some such concerns. Please note

Appendix 1 - Guidance for Digital Monitoring, Reporting, and Verification (DMRV)			
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		Currently, standard ML approaches enable models to create and learn their own features. If features are required to be reported, the model would have to be rebuilt to output its own features. Due to this, we don't see this guidance as realistic.	the dMRV best practice guidance was informed by discussions held with multiple dMRV proponents. These recommendations are intended as best practice guides, and thus may not be applicable / practical for all dMRV systems or a given project. It should also be noted that ultimately a VVB must assess the data monitoring, whether it is from a given dMRV system or other format. The VVB must have access to all project data. It should also be noted that there will be no pre-approval of any particular dMRV platform.
324	Regrow Ag	This section states "Remote sensing data should be corrected to surface reflectance units (atmospheric correction) and filtered for clouds and cloud shadows. Consider limiting the amount of correction that may be applied to a single scene." We believe the consideration of limiting the amount of image correction does not need to be applied to workflows designed to support the use of uncorrected or corrected imagery for model training and feature generation. (e.g., when machine and deep learning methods are used on large, representative datasets over a sufficient period of time).	Thank you for your comment. Please note that particular recommendation was intended to address concerns raised by stakeholders regarding the perception that AI/ML systems can be 'blackbox', and thus hard to verify and hard to trust. The guidance that multiple data sources be used to corroborate and cross-reference should help address some such concerns. Please note the dMRV best practice guidance was informed by discussions held with multiple dMRV proponents. These recommendations are intended as best practice guides, and thus may not be applicable / practical for all dMRV systems or a given project. It should also be noted that ultimately a VVB must assess the data monitoring, whether it is from a given dMRV system or other format. The VVB must have access to all project data. It should also be noted that there will be no pre-approval of any particular dMRV platform.
325	Regrow Ag	We want to highlight that this guidance is reminiscent of older workflows within a consultant-driven framework. As we move towards an approach leveraging machine learning at scale, we suggest that the requirements for DMRV QAQC should be	Thank you for your comment. Please note that particular recommendation was intended to address concerns raised by stakeholders regarding the perception that AI/ML systems can be 'blackbox', and thus hard to verify and hard to trust. The guidance that multiple data sources be used to corroborate and cross-reference

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		outcomes and performance-driven rather than focusing on the components of the approach (e.g., ability of the models and systems in use to accurately characterize agricultural practices at the field level).	should help address some such concerns. Please note the dMRV best practice guidance was informed by discussions held with multiple dMRV proponents. These recommendations are intended as best practice guides, and thus may not be applicable / practical for all dMRV systems or a given project. It should also be noted that ultimately a VVB must assess the data monitoring, whether it is from a given dMRV system or other format. The VVB must have access to all project data. It should also be noted that there will be no pre-approval of any particular dMRV platform.
326	NetZeroAg	Future proofing methane estimation from rice paddies by adopting satellite data in the context of a broader integrative measurement infrastructure. This includes high spatial resolution changes in hydrology that could be used as a proxy for methane emissions, subject to routine calibration against ground-based sensors. This would allow a large-scale measurement network to consist of a few super sites that include GC-FID or extensive ground-based studies, log-book records, and enable the use of satellite data to study elsewhere (including other geographical regions). Other data, including regular time/location stamped photographs, could be incorporated into the measurement infrastructure using AI technologies.	Thank you for your comment. The requirements to use GC equipped with FID will be maintained, as they represent conventional best practices.
327	CarbonFarm Technology	We are happy to see the introduction of satellites as a third-party data source. For one, it is logistically difficult to collect self-	Thanks for the feedback.

Appendix 1 - Guidance for Digital Monitoring, Reporting, and Verification (DMRV)			
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		reported data from hundreds of thousands or smallholders. Moreover, it is unrealistic to believe that smallholder farmers would rigorously document irrigation practices on a day to day basis rather then at the end of the season when project developers lack any ability to verify historical claims. In this regard, we look forward to the added transparency that satellite monitoring will provide.	
328	The Nature Conservancy	Inclusion of "remote sensing data" for ground truthing should be done carefully, especially for verifying activities like AWD schedules where there is not good evidence of its accuracy. When remote sensing data is used for ground-truthing, methods, data, and uncertainties in the data must be provided to the VVB to independently verify its accuracy.	Thanks for the feedback. As mentioned, a VVB must assess project MRVs independently.
329	Indigo Ag	Table A2.1 provides the following example for setting temporal resolution: "A project proponent uses RS to detect irrigation events. The project proponent ensures satellite image frequency is high enough to capture the typical and/or expected dry period duration for project farmers. The project proponent employs the use of satellite imagery with 2–4-day frequency around expected irrigation events, as they know that the farmers typically dry their fields for 4–5 days."	Thank you for your comment. The cited guidance is intended to illustrate an RS temporal frequency suitable in the given example but not all drying events. The guidance did not insinuate that RS data could be used to measure moisture content. The visual spectrum RS data may be sufficient in some circumstances to indicate flood vs non-flood. Please note that none of the guidance in this table is intended to indicate RS is suitable at all plant growth stages. Based on the feedback from other dMRV proponents, it appears some data suitable for penetrating the canopy may be available and thus serve to corroborate activities undertaken once canopy cover is established. Nonetheless, the robustness of a DMRV must be assessed by a VVB, and in all cases, in situ field

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		However, dry down events can last for as little as 1 day, which could be missed with a 4 day resolution. Furthermore, on page 6 and 46, the draft protocol states that the water level must reach -15 cm below the soil surface during the entire drainage period. While soil moisture at -15cm may be detectable in theory with remote sensing, e.g. with Synthetic Aperture Radar (SAR), this may not yet be possible in practice. There are not currently publicly available datasets with the required temporal resolution, and commercially available SAR data tend to be in the X-band, which is too short of a wavelength to penetrate the vegetation canopy.	data is needed for cross-validation and verification.
330	VGS	RS may not be affordable or reasonable option for the project proponent when they have robust monitoring system in place supported by materials/soil test reports/photographs, log books, training materials, field demos etc. The developer uses to quantify either reductions and removal of GHGs during the project phase and total Carbon Credits quantification completely based on the field data. The intervention of RS/ML/AI may interfere the analysis because of its own technical efficiency. So it should be optional for VBB or registry to be considered	Thank you for your comment. Please note that the methodology encourages the use of various dMRV technologies, but such technologies are not mandatory. Please refer to Box 1 for a summary of acceptable data sources. Note that the methodology also contains guidance on appropriate data sources for other parameters, such as the guidance on emission factors in Section 8.3.

Appendix 1 - Table A2.1

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331	Mantle Labs	"A project proponent uses a combination of public and proprietary RS datasets and provides the VVB access to their GIS-enabled platform, enabling the VVB to undertake spot checks." With public data such as from Sentinel Satellites, the VVB (and all stakeholders) can check if the digital data used for the exercise is identical to the same data provided by ESA. If a developer uses proprietary data, they can in principle modify the digital data and the VVB would have no means to check this, because they would not have access to the original imagery, only what would be provided to them by the developer. Furthermore, VVBs would also need to have the expertise and knowledge within their organisation to credibly assess the varied RS approaches that might be deployed by project developers.	Thanks for the constructive feedback. In the example you cite, a VVB could potentially use public data to compare to the proprietary data made available by the project. Please also note that throughout the guidance in Table A2.1, the guidance suggests that projects should use multiple data sources to build confidence in their assertions. Regarding VVB expertise and knowledge, the same assertion could be made regardless of whether public or private data is used. The guidance in the methodology is meant to encourage the use of emerging dMRV technologies, to combine data from those with corroborating alternative sources, and to provide guidance on best practices.
332	Mantle Labs	"Project proponents should validate ML/AI model results against independent ground truth data" A suggestion would be for Verra to organise a set of such independent ground truth data against which service providers could validate their models. This would make the validation more standardised and comparable as well.	Thanks for the feedback.

Appendix 1 - Table A2.1			
#	Organization	Comment	Developer's Response
333	Mantle Labs	"Project proponents using dMRV should provide some analysis of the accuracy/error rates of the digital systems they are deploying. Project proponents should consider developing an error threshold for their systems, and a rule whereby they would replace any data that fails to meet such requirements." The guidance here is quite vague, allowing the developers to decide themselves what is an acceptable error threshold for their dMRV systems. This minimum error% is something that should be specified across all project, otherwise buyers/investors will have to sort through projects of vastly different integrity and quality registered under the same methodology.	Thank you for your comment. During the course of development of this methodology the authors engaged with multiple proponents of dMRV systems. We were not able to reach an informed position regarding how to set an error threshold for such systems. This issue will be explored further by Verra and may result in additional guidance for future methodology versions.

Appendix 2 - N2O Correction Factor

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334	University of Uppsala	It would be important to allow regional measurements of N2O correction factors - also linked to Section 8.3.3.	Thanks for the comment. Direct measurements are allowed under QA2 only for CH4 measurements. Regional N2O EFs may be used under QA3, refer to subsection 8.1 for detailed guidance.

Appendix 2 - N2O Correction Factor			
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335	Indigo Ag	Compared to Table 11.1 (Updated) in Chapter 11, Volume 4 of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, available at https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch11_Soils_N2O_CO2.pdf, Table 6 contains a few incorrect values and typos, and is also missing a few values and rows. However, it is not clear why the entire table is presented, and the only portion of Table 11.1 (Updated) that is relevant to the protocol is missing (emission factors for "continuous flooding" and "single and multiple drainage") . We recommend including only the relevant rows of the table, but if the entire table is included, we recommend ensuring that it all of the information is the same as in the source document.	Thank you for your comment. The methodology has been revised and table 6 moved to Appendix 3, Table 9.

General Feedback

General Feedback			
#	Organization	Comment	Developer's Response
336	CarbonFarm Technology	We would like to start be congratulating the	Thank you for the constructive feedback.

General Feedback			
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		authors of the draft methodology for their work. The new methodology adds many measures that we believe will improve the quality of projects, reduce the risk of over crediting, and instil confidence among buyers. In light of this, we propose a number of remarks, comments and recommendations that we hope will continue in this vein, further improving the quality of credits that stem from the methodology while ensuring the right balance with ease of implementation. In the market there seems to be a huge push for greater certainty in exactly how much carbon is being avoided and decreasing the risk of over crediting. If not all activities can be monitored with the same level of rigour, we would be concerned that the this tarnish the reputation of the methodology and ultimately reduce demand for credits.	
337	Ostrom Climate Solutions	Definition of AWD - this water saving technology when practiced does not necessarily always mean reaching water level of -15 cm below the soil surface before re flooding or irrigation water is applied. The determining factor is the crop management to be adopted or practiced e.g. fertilizer application and the growth stage of the rice crop. Such crop management is the application of fertilizer	Thank you for your comment. The guidance with respect to defining AWD, and the depth and duration of drainage events has been replaced with the following: Each project must use persons with suitable qualifications and/or agronomic experience to develop criteria specific to each stratum and/or rice variety, with respect to the recommended depth and duration for AWD drainage events. In developing guidance for the project farmers, the given expert must take into account the critical goal of ensuring yield does not decline by more than 5% as a

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		which need at least 5 cm of standing or ponded water for 5 to 7 days for more fertilizer use efficiency and to avoid volatilization of nitrogen. Similarly, [ponded or standing water is also necessary during flowering to avoid sterile spikelets and empty or half filled grains due to limited water or stress due to drought. GHG emission is still reduced even if only a portion of the -15 cm layer is dry or devoid of water as oxidation takes place in that portion thus reducing GHG emissions. AWD is supposed to be practice in such a way that there will be no yield reduction due to less water used because the amount of moisture is reduced in non critical stages of the crop and to increase nutrient use efficiency.	result of implementing the AWD activities. Where it is recommended by the given expert that a region of the project should employ AWD to a depth of less than 10cm below the soil level, the project must use Quantification Approach 2 for any such areas of the project. Note, where Quantification Approach 2 is applied, it is still necessary to ensure all project farmers are following the agronomic guidance provided by the project proponent with respect to the appropriate depth and duration of drainage specific to their stratum. With respect to timing of when AWD events are to occur, it is recommended, but not required, that farmers undertake their first AWD drainage event at least 21 days after the initial flood, to ensure the pre-flood N application has time to be absorbed and is not washed away. Demonstrating that farmers have been provided training and agronomic guidance in the appropriate depth and duration for AWD for their given area is required. Training alone is not sufficient to demonstrate AWD was actually employed in a given project. It will be the responsibility of each project proponent to determine what data is sufficient to meet the Monitoring, Reporting and Verification requirements of the methodology, following the guidance throughout the methodology, including Box 1. It will then be the role of the VVB to determine if such MRV efforts are reasonable and sufficient to meet methodology requirements, in the given circumstances.
338	Green Carbon, Inc	The fertilizer interval is a bit large. Should be subdivided into: <90; 90-150; 150-210; >210, will be more suitable for production conditions.	Thank you for your comment. The methodology guidance is consistent with best practices for project stratification while enabling robustness of emissions quantifications and cost-effectiveness for project implementation. Therefore, the guidance for stratification for N fertilization

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			rate remains as, <100 kg/ha; 100-200 kg/ha; 200-300 kg/ha and >300 kg/ha.
339	Green Carbon, Inc	"Evidence must be provided in the form of publicly available information contained in" should be clarified: Evidence must be provided in the form of publicly available information contained in at least one of the following forms (where possible, multiple forms of evidence are recommended).	Thank you for your comment. We added further information for data requirements in Section 7.3.
340	Green Carbon, Inc	in many places, the method of transplanting young seedlings (about 10 days old) is used so that the rice develops better roots after transplanting. 20-30 days are therefore no longer suitable.	Thanks for the comment. The methodology does not prescribe the number of days for transplanting. However, it provides general guidance on when seed transplanting should occur. We revised Section 3 Definitions of DSR as follows: "...For DSR, the field must be dry before seeding and remain dry during sowing until the seed has germinated so that viable, young plantlets can withstand shallow flooding (at the two-four leaf stage). "
341	Indigo Ag	A summary of Key Points is provided:• Concern about the potential use of national-scale emission factors on very small scale projects, where there is the potential for them to be wildly inaccurate. We recognize that the costs of direct measurement and/or modelling are often too high for very small scale projects. However, the potential trade off in accuracy here is significant. We recommend that you explore the potential for grouping of such small projects for the purposes of quantification, with a requirement that the group be sufficiently representative of the EF.	Thank you for your comment. Verra released an update in August 2023 to provide guidance for methodologies that include upstream displacement activities. These activities are defined as "a project activity that reduces GHG emissions upstream of where the project activity is implemented, such as through product substitution, fuel switching, decreased demand for a given activity, product, or service, or other forms of displacement." As part of this update, methodologies must provide evidence of one-to-one displacement between the downstream intervention and the upstream impact. Without this evidence, methodologies must provide an upstream displacement discount factor, based on peer-reviewed literature or a market analysis of supply and demand elasticities.

General Feedback			
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		• Guidance around when SOC is included vs excluded is contradictory throughout the document. • More guardrails are needed to protect against SOC loss for projects that exclude SOC from the accounting. • More consideration of crop rotations and their impact on rice projects. • More clarity around determining baselines, especially with regard to time periods and to the case where only some of the project activities are able to pass the common practice assessment. • Suggestions to revise the definition of AWD. • Removal of the option to account for reductions in upstream emissions related to fertilizer production. • Elaboration of the data source hierarchy described in Box 1.	Considering the complexities you raised related to fertilizer supply chains and the fact that this optional source of emission reductions represents a minor pool in the methodology, we have elected to remove this pathway. We appreciate your input.
342	Ostrom Climate Solutions	Baseline control sites - based on experiments previously conducted to compare emission reductions in baseline and project sites, the sources of variability must be reduced such that the only potential sources of variation is the difference in water management as in this case, AWD (the adopted project activity). It is recommended that paired sample plots for baseline and project sites be nearby one another (or even set up in the same field) and have similar historical management to also eliminate historical variability i.e. differences in crops planted,	Thank you for your comment. Projects will have to determine the optimal implementation of methodology requirements and calculate associated errors/uncertainty in subsection 8.6.

General Feedback			
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		organic amendment previously applied, etc. Baseline sites or plots can be provided with physical barriers so as to maintain water level and avoid seepage or water loss laterally. In the same manner, variability due to weather and inherent soil characteristics e.g. percolation will be avoided as percolation rate affects drainability of the area would be minimized through this approach.	