SUMMARY OF PUBLIC CONSULTATION

VM0018 Methane Avoidance through separation of solids from wastewater or manure treatment systems (AMS-III.Y. Revision)

A draft of the methodology *VM0018 Methane Avoidance through separation of solids from wastewater or manure treatment systems (AMS-III.Y. Revision)* was open for public consultation between 6 February 2026 and 9 March 2026. This document includes a list of all comments received and Verra's response.

KEY QUESTIONS

Question 1: Do you consider the requirements in the draft methodology feasible to implement? If not, what alternative approaches would you suggest to better address concerns related to the use of recycled bedding material?

#	Organization	Comment	Verra's Response
1	3Degrees Group, Inc	While we recognize that both animal and human health considerations are central to the proposed changes in the methodology, the new testing and tracking approaches outlined in the draft extend well beyond what is feasible to implement at typical dairy facilities. Bedding from separated solids is a common and well-established practice across the dairy industry, and producers already prioritize herd health and animal welfare in their management decisions. As the revision process for AMS-III.Y moves forward, we urge Verra to keep in mind the operational and resource constraints that many dairy producers face. Requirements that introduce complex monitoring, testing, or recordkeeping obligations can create significant additional burdens for farmers who are already operating within tight labor, time, and financial margins.	Thank you for these observations. We appreciate your emphasis on the practical constraints dairy producers face. We reviewed the specific points raised in the "General Feedback" section and adjusted the methodology to address operational and resource constraints while maintaining necessary rigor.

Question 1: Do you consider the requirements in the draft methodology feasible to implement? If not, what alternative approaches would you suggest to better address concerns related to the use of recycled bedding material?			
#	Organization	Comment	Verra's Response
		The draft methodology includes several specific provisions that would be operationally infeasible or overly burdensome for farms to implement. We have highlighted these provisions below in the "General Feedback" section, and provided recommendations intended to balance methodological rigor with practical implementation considerations.	

Question 2: Do you believe the proposed changes addressing projects that use biofiltration systems are both feasible and adequate to implement?			
#	Organization	Comment	Verra's Response
2	3Degrees Group, Inc	The total volume of liquid processed in the biofiltration system, using a continuous flow meter in the system: Biofiltration can still be sampled before and after the process. This flexibility should be allowed.	Thank you for this suggestion. A continuous flow meter is required to ensure that the total volume of liquid treated in the biofiltration system is accurately measured, as reliance on periodic sampling may reduce measurement accuracy.

Question 3: Do you have any other comments on the draft proposal?			
#	Organization	Comment	Verra's Response
3	3Degrees Group, Inc	We appreciate the language addition of "project activities involving a change of equipment resulting in efficiency improvements or capacity addition of the …manure treatment". This will allow	Thank you for your positive feedback on the added language and for identifying the typos in the draft. We corrected this in the final version.

Question 3: Do you have any other comments on the draft proposal?			
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		projects to expand their baseline use of separation equipment through credit incentives, especially in cases where flocculant purchases can hinder expanded use of separators. We identified two typos in the draft: Section 7.2 2nd paragraph has a reference to Section " ". Missing number. There is a typo in Paragraph 4(c), which addresses 4(b) not 4(c).	

GENERAL FEEDBACK

Section 1 – Summary Description			
#	Organization	Comment	Verra's Response
4	BioFiltro	There is confusion throughout the methodology regarding the terms filtration, separation, and biofiltration. It is unclear whether filtration is intended to be synonymous with mechanical separation or with biofiltration. Could the terms be clearly defined? Related to this: • Vermicomposting vs. vermifiltration: The treatment of liquid waste using earthworms is vermifiltration, not vermicomposting. Vermicomposting refers specifically to the treatment of solid waste streams. • The reference to 60,000 tCO_2e in Section 1 is linked to the CDM small-scale methodology categorization. Could the limit be removed? The change would avoid excluding larger projects.	Thank you for highlighting the confusion regarding the use of the terms and the distinction between vermicomposting and vermifiltration. The methodology now refers only to vermifiltration as a type of biofiltration system. Thank you for your comment regarding the 60,000 tCO_2e reference in Section 1. This threshold was intended to reflect that this methodology incorporates simplified and less stringent requirements than those typically applied to larger projects. To enable larger manure management projects to use this methodology, additional requirements were introduced, including minimum baseline retention times, minimum yearly average temperatures and specific characteristics of the baseline anaerobic lagoon.

Section 4 – Applicability Conditions			
#	Organization	Comment	Verra's Response
5	3Degrees Group, Inc	(Section 4.7.b.i) Treated solids must reach a minimum dry matter content of 35% While the dry matter content threshold is reasonable, it is unclear what frequency of testing will be required, and if that testing needs to be site-specific. 3Degrees recommends testing once per crediting period as opposed to annual testing, where practices do not change. Verra should also allow studies to be used as evidence of dry matter content by treatment or separation technology. (Section 4.7.b.ii) The recycled solids must be used on the same farm and for the same animal herd in which they were produced. If "herd" is referring to the full farm, this may not be an issue. But if the implication is that separated solids from the milking herd must be kept separate from the dry herd, this would not be feasible under typical manure management practices. On the vast majority of dairy farms, all manure from all herds is collected into the same lagoons. This constraint would also apply in the baseline scenario. Additionally, it is worth noting that it is a very common practice for separated solids to be shipped to neighboring farms as compost for field addition. We strongly recommend clarifying that this provision applies only to bedding.	Thank you for this feedback. Where separated solids are used for bedding, the applicability conditions require that at validation, the PP must demonstrate that the separation technology ensures a dry matter content of at least 35%. During monitoring, the methodology was adjusted to require dry matter testing at least quarterly at each site, and whenever operating conditions change. However, to facilitate this monitoring, we introduced the possibility of using simpler electronic measurement devices. We consider this testing frequency to be manageable for most sites, as dry matter monitoring is a straightforward procedure and dry matter testing is necessary to demonstrate compliance with the existing minimum 20% dry matter requirement throughout the process. Reducing the monitoring frequency to once per crediting period could increase the risk of failing to detect changes in separation performance or operational practices. The requirement that recycled solids be used on the same farm and for the same herd was introduced to minimize the risk of cross-contamination between different animal types when bedding is recycled. Thus, there is no need to keep solids from milking cows separated from dry cows, however, solids from cattle should not be used as bedding for other animal types such as swine. This was further clarified in the methodology. Finally, all requirements in paragraph 7b are only applicable to farms using recycled solids as bedding. We clarified this further in the methodology.
6	BioFiltro	The requirements imposed on projects where separated solids are used as bedding appear excessive and go beyond the scope of a carbon methodology.	Thank you for the comment. We appreciate the concerns raised regarding the additional requirements for projects that use separated solids as bedding, and we understand the perspective

Section 4 – Applicability Conditions			
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		• Product quality checks are already governed by existing laws and regulations. These requirements should not be mandated by the carbon project. The additional planning, management, and monitoring requirements place a significant burden on farmers and are not required in other livestock or manure management methodologies. More broadly, we question the consistency and rationale for this approach. To our knowledge, voluntary carbon methodologies generally do not regulate the safety of inputs or outputs. For example, methodologies do not typically impose requirements related to the safety of chemical fertilizer use, other agricultural practices, or the safety of food crops produced. If such considerations are not addressed elsewhere in the program, it is unclear why similar downstream or ancillary requirements are being introduced in this case. This creates an inconsistent precedent and introduces requirements that appear to fall outside the typical scope of carbon accounting methodologies. If requirements can't be eliminated, can they apply solely to projects that introduce separated solids as bedding? If bedding use already exists in the baseline scenario, the project does not materially affect bedding practices, and additional requirements seem unjustified.	that some of these elements may appear to extend beyond the traditional boundaries of a carbon methodology. However, the VCS is a globally applicable standard, and as such, we cannot rely on the existence or enforcement of national or regional laws to guarantee safeguards. In many jurisdictions where VCS projects may operate, regulations related to product safety, waste management, or environmental health may be absent, insufficient, or inconsistently implemented. Further, the VCS Standard, v5.0 includes explicit requirements ensuring that projects do not have negative impacts, such as Section 3.19: "Project activities must not negatively impact the natural environment or communities." Even though these issues are addressed at a high level within the Project Description (PD), as the methodology revision introduces specific project activities—such as the handling and use of separated solids as bedding—that could, if poorly managed, pose risks to human health, animal welfare, and environmental quality, we believe it is important for the methodology to include safeguards that ensure these practices are implemented responsibly across all contexts. That said, we also agree that some of the proposed requirements may be unpractical in many dairy systems, and requirements were adjusted. Regarding situations in which a project does not recycle solids as bedding, the requirements referenced do not apply. Therefore, if a project does not introduce the use of project-generated solids as bedding, these requirements would not be applicable.

Section 8 – Quantification of Reductions and Removals			
#	Organization	Comment	Verra's Response
7	3Degrees Group, Inc	(Section 8.1.24) "Where there is more than one separation system in sequence, the efficiency of n sequential separation devices must be determined as follows: 1 – (1 – E1) × (1 – E2)… × (1 – En), where E1 to En is the efficiency of the separation devices in sequence." For this section, our recommendation is to allow default separation rates and to allow testing of combined separation equipment when used in sequence. Measuring or testing the efficiency of each stage of a separation sequence may not be feasible due to the layout of the equipment itself, without testing port access. A full system separation rate would still allow for accurate separation rates to be used. (Section 8.2.29 & 35) CDM Tool03 for Fossil Fuel Combustion: Farm equipment is often used for many purposes, and direct metering of the equipment only at the time it is being used for project activities will not be possible. Confirmed attestations from employees on-site should suffice for the use of equipment for projects, and these emissions are often de minimis compared to overall emissions. (Section 8.2.30) Please align the definition for 'deep bedding' with common definitions, such as the one from the IPCC (2019 Refinement IPCC_V4_Ch10_Livestock).	Thank you for this suggestion. The intention of the draft methodology was indeed to allow the use of combined separation efficiencies when multiple separation equipment always operate in sequence. We clarified this more explicitly in the final methodology. Regarding the suggestion to allow default separation rates, we think that separation efficiencies can vary significantly depending on how equipment is operated, and allowing default values may introduce significant inaccuracies. We understand that farm equipment is typically used for multiple purposes and that direct metering is often not feasible. We addressed this by introducing a conservative estimation approach based on the installed power capacity/consumption rate and operating hours during the monitoring period. Thank you for the recommendation regarding the definition of deep bedding, it was added to the methodology.
8	BioFiltro	Several clarifications are needed regarding baseline emissions calculations: • Equation 1b for baseline emissions in operations that don't use organic bedding appears to include only one baseline treatment pathway. Could the combination with mechanical separators be addressed more clearly?	Thank you for pointing this out. To clarify, paragraph 23 of the revised methodology specifies that Equation 1 from the original methodology must be used to calculate baseline emissions when the barns do not use organic bedding material. However, if any component of the project system involves the use of a biofiltration system, both as a standalone system or as a component of the project system, then Equation (1b) must be applied—but only to that

Section 8 – Quantification of Reductions and Removals			
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		• Why is the equation related to the use of biofiltration added to the baseline and not the project emissions quantification? • The methodology does not address situations in which nutrient removal from liquid manure enables changes in effluent storage management, such as reduced retention time due to increased land application capacity. How can the methodology account for a different MCF for effluent water under these conditions?	specific component. Thus, the total baseline emissions would be the result of Equations 1 (used to calculate baseline emission from the conventional separation systems) and 1b (used to determine baseline emissions from the biofiltration system). We included the biofiltration equation only in the baseline based on the assumption that biofiltration systems remain fully aerobic and that the retention time is insufficient for methane generation. However, based on this comment and the other related comment , project emissions were adjusted to also account for methane formation when biofiltration systems are used. If shorter storage times in the project scenario result from volatile solids (VS) removal through the project's filtration system, this is already captured through the methodology. Other nutrients included in the waste are outside the scope of the methodology revision. We appreciate this observation and will consider whether future revisions should address project emissions from storage in relation to residence time.

Section 9 - Monitoring			
#	Organization	Comment	Verra's Response
9	3Degrees Group, Inc	(Section 9.2) Allow for calculated values for VS & Mss: there are well-established formulas used by AMS-III.Y and other methodologies that allow for these values to be calculated, not measured. Weighing on-site of the herd and of the weighed solids before use is not feasible with farm practices, and is not something that is done in current practices with any uses of separated solids. The use of calculations & models is also a peer-reviewed practice and is enforced through its acceptance in the	Thank you for this clarification. While we recognize that routine weighing of the herd and separated solids may increase monitoring requirements from current practices, it is important to ensure that the separated volatile solids values used in the calculations reflect the actual, site-specific conditions. Animal weight can vary significantly across operations due to breed, diet and production practices, and these weight differences directly influence the amount of VS excreted. Because VS and Mss values

Section 9 - Monitoring			
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		voluntary & compliance carbon markets. (Section 9.2.42.c) "In the case of flocculants, the amount of manufactured ingredients of flocculants used" - It is unclear how the amount of manufactured ingredients in flocculants used would impact the integrity of the project. Before adding new requirements, we recommend that Verra clarify why this information is needed and how it will be used. (Section 9.2.43.c) B0_LT: Allow for herd and site-specific calculations of this value, using scientifically reviewed studies through feed information for each site. (Section 9.2) Average animal weight of a defined livestock population at the project site (Wsite) - Requiring facilities to weigh animals would impose an unnecessary burden, as this is not standard practice on dairy farms, particularly on a quarterly basis. Default values from IPCC or comparable studies should be allowed.	are a core determinant in calculating ERRs, relying solely on defaults can lead to systematic over- or under-estimation of ERRs. Regarding the comment on reporting flocculant use, we would like to clarify that this requirement is not new. The need to report "the amount of manufactured ingredients of flocculants used" was already included in the original methodology under paragraph 42(c). Its purpose is to ensure that project emissions associated with the manufacture of flocculants used in the project are appropriately accounted for. Regarding Bo_LT, the methodology allows default values based on country-specific published sources, however, calculations based on feed information are not allowed. We may study this possibility for future revisions. As noted above, allowing default values for Wsite could introduce significant uncertainty, as animal weight directly affects the emission-reduction calculations. We do recognize that quarterly monitoring of animal weight may be perceived as overly frequent in some cases, particularly for animals whose weight remains relatively stable. However, the methodology is designed to be applicable across all situations and animal types.

Appendix 1: Guidance on Safe Use of Separated Manure Solids as Bedding Material			
#	Organization	Comment	Verra's Response
10	3Degrees Group, Inc	(Appendix 1) While well-intentioned, the monitoring requirements from this appendix are burdensome beyond what would be feasible at a facility. Dairies already maintain practices that support animal welfare, soil health, and employee safety, and herd welfare is central to any dairy's operation. However, the additional requirements to document, validate, and verify this plan would create a significant administrative burden that falls outside of the scope of the project activity. Additionally, the use of separated solids as bedding is extremely common on dairies and accepted under many VCM protocols. Re-bedding and cleaning dates may not follow a fixed schedule. While facilities generally know the approximate frequency of these activities (e.g., roughly every three days, depending on the barn), maintaining a log to track dates would be difficult to verify and confirm, adding an additional burden on the facility. Maintain records of observations of animal well-being issues and behavioral properties: animal health issues can occur for a variety of reasons; assuming that the issues stem from bedding used in barns would be inappropriate without specialized veterinary assessment. Verra & verifiers will not have the expertise to discern where health issues stem from, and verifying this sensitive information would be highly burdensome. Human health and safety: This can be attested to and observed on site visits; however, it is unclear what specific evidence is expected here under the draft methodology. Additionally, sanitization of equipment used for handling bedding materials would be difficult, as the machines are often used for many parts of farm life, and sanitization between uses is not the norm. Use dedicated equipment for handling bedding and manure: this is not standard practice on any farm. Requiring the use of dedicated haulers or spreaders for bedding alone would impose a significant operational and financial burden on facilities and is unlikely to be practical for most dairy operations.	Thank you for your feedback. We recognize that many of the monitoring elements outlined in the draft appendix may be burdensome, particularly for facilities that already implement practices to support animal welfare and employee safety. However, as a global standard, the methodology must be applicable across a wide range of geographies and farm types. Many of the conditions mentioned in your comment cannot be assumed to apply uniformly to all livestock operations worldwide. In some settings, basic practices that may be standard in certain regions are not consistently implemented, and the methodology must therefore offer safeguards that ensure minimum environmental, animal welfare, and human safety requirements across diverse contexts. That said, we also agree that some of the proposed monitoring elements may be unpractical and unnecessary in many dairy systems. In response to this feedback, the monitoring requirements were revised to require only the most essential elements needed to ensure the project poses no harm to animals, environment and humans. Less critical items are included as good practice guidance in Appendix 1, rather than mandatory requirements.

Section 12 – General Feedback			
#	Organization	Comment	Verra's Response
11	BioFiltro	The language around emissions from storage, use, and disposal of separated solids can be clarified: • If solids are stored, then composted, and last used as bedding, is each step added as a full treatment pathway? The same VS would generate three sets of annual emissions? • Why does paragraph 30 only include solid storage as a storage/use method? The parameter PEyss is defined as project emissions from solid storage, and the MCFss parameter also refers specifically to solid storage. However, the subsequent parameters VSTss and MTss,y are defined more broadly as solids that are stored, treated, or used. In the IPCC guidelines (Table 10.17), solid storage is only one type of manure management system, alongside alternatives such as composting, dry lot, and other systems. It is therefore unclear why the methodology appears to restrict emissions accounting to solid storage while some associated parameters refer to a broader set of solid management pathways. Clarification is needed on how emissions from solid management systems are intended to be included within this framework.	Thank you for the question. For each treatment stage (storage → composting → bedding), project emissions are calculated based on the VS measured at the entrance of that specific stage, which is reflected in paragraph 30 of the revised methodology. However, the methodology does assume—as a conservative simplification—that each treatment step treats all VS entering that specific step. Thank you for the observation on the parameters in Equation 8. The parameter description was corrected so that Equation 8 may be applied not only to storage, but also to treatment and use.
12	BioFiltro	The IPCC defines deep bedding / bedded pack systems as "systems in which bedding accumulates over a production cycle of approximately 6–12 months and may be combined with dry lot or pasture conditions". Leso et al. (2020) define a compost bedded pack as a mixture of organic bedding and cattle excreta that is actively cultivated one to three times per day to incorporate fresh manure and oxygen, thereby promoting aerobic composting. The depth of the pack can range from approximately 20 cm to over 1 m, depending on bedding input and management practices. An expert review further describes stirring deep bedding to a depth of approximately 10–12 inches	Thank you for the comment. We acknowledge that different deep bedding systems and management practices can result in different MCF values. However, even if the MCF may be too conservative, applying Equation 8 is not expected to result in high project emissions, as the VS must be adjusted to the actual value entering each stage, that is, after treatment (composting or drying). Regarding the question of why a 10 cm (3.9 inch) bedding depth, this threshold was initially introduced to ensure methane emissions were accounted for when bedding becomes deep

Section 12 – General Feedback			
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		to introduce oxygen, support aerobic decomposition, generate pathogen-killing temperatures, and maintain bedding quality. Deep-bedded pack barns are considered an alternative to freestall barns. They are constructed over compacted clay rather than impermeable flooring and assume long-term accumulation and active in-barn composting. In flush systems, bedding is continuously removed with water and does not accumulate or undergo in-barn composting. These definitions highlight that bedded pack systems are a composting process fundamentally different from systems where bedding is used in freestalls, especially when the proposed modification M0370 methodology requires composting of separated solids prior to reuse in the barn. Is the MCF for deep-bed emissions in the IPCC report a high overestimate for emissions from separated solids already composted and then used as bedding in freestalls? Adding annual emissions from separated solids during storage, then composting, and then using as bedding would largely overestimate emissions from the same VS pool. Why is a layer of only 10 cm (3.9 inches) suggested to be considered for the deep bedding system?	enough to prevent aeration, potentially creating anaerobic pockets. However, based on feedback, this fixed depth requirement was removed, and the deep bedding definition was introduced.
13	BioFiltro	Paragraph 29 requires that project emissions account for total VS or COD, including organic components added as part of the project (e.g., worms, wood chips). However, the dairy vermifiltration MCF value published in Dore et al. (2018) and included in the IPCC Emission Factor Database is based on measured CH_4 emissions from beds containing worms and wood chips. In the study, the MCF was calculated as the ratio of measured CH_4 emissions from manure, worms, and chips over the potential emissions of the Manure VS.	Thank you for the comment. The methodology was revised to include project emissions from the biofiltration system, which will be quantified using Equation 8 and using the MCF value of 1% sourced from the mentioned report.

Section 12 – General Feedback			
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14	BioFiltro	Paragraph 29(a)(iii) appears to conflict with AMS-III.Y Section 2.3, Paragraph 3, which states that neither the baseline nor the project scenario may be equipped with methane recovery systems. Please clarify whether this is a contradiction or a misinterpretation.	Thank you for raising this point. Paragraph 29(a)(iii) refers specifically to methane emissions from solid storage, which typically does not involve any methane recovery or combustion system. Therefore, it is not in conflict with AMS III.Y Paragraph 3. However, we acknowledge that the draft revision allowed the use of biodigesters for treating separated solids, which could create confusion in relation to AMS III.Y Paragraph 3. To address this, the option to treat solids in biodigesters was removed to ensure consistency with the applicability conditions.
15	BioFiltro	Several monitoring definitions require clarification: • Paragraph 42(a): MSs,y is defined as the mass of all separated solids measured by direct weighing of all separated solids. How are solids retained or processed within biofiltration systems accounted for? • Paragraph 43: About the requirement for the frequency of monitoring herd data. Many dairies do not track herd size daily. Can the term "average" be removed to allow flexibility and to better reflect the reality of the dairies? • Appendix A1.3: What surfaces or soils are to be monitored, particularly when liquid manure is primarily collected from concrete floors?	Thank you for the comment. Paragraph 42(a) refers specifically to Equation 1, which applies to conventional separation systems where the mass of separated solids and their VS content can be directly monitored. Instead, projects using biofiltration systems should apply the new Equation 1b to the biofiltration component, which is designed for cases where direct measurement of separated solids is not feasible. The average number of animals must be determined following the procedures established in ACM0010. This was adjusted to align with the requirements for larger projects (given the request to remove scale limits). The monitoring requirement in Appendix A1.3 was introduced specifically for situations where liquid manure or effluent is spread or discharged onto soils, and where there is potential interaction with natural surfaces. If the project farm collects manure exclusively from concrete floors and liquids are fully contained, then this requirement would not apply.
16	BioFiltro	Page 9: system I should be system i.	Thank you for identifying this error. The reference has been corrected from system I to system i in the revised text.

Section 12 – General Feedback			
#	Organization	Comment	Verra's Response
17	BioFiltro	Page 10: Equation (3) is not defined.	Thank you for the comment. The Equation 3 referenced on page 10 corresponds to Equation 3 in the original AMS-III.Y methodology. This was further clarified in the methodology.